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FOCUS ON AUSTRIA

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This Issue's Special Focus:

The Monetary Policy
of the Eurosystem

Oesterreichische Nationalbank

Focus on Austria

2 / 2000

Contents

One and a half years after the changeover to Stage Three of Monetary Union, one of the central questions about monetary policy is how the new system of a single European monetary policy and the institutions created for this system operate in practice. The changeover involved much fewer uncertainties and difficulties for monetary policy than many people had expected. Moreover, the Eurosystem tackled a range of monetary policy challenges during these 18 months while successfully pursuing its prime objective of price stability. This shows that opting for a monetary policy strategy which pragmatically blends elements of money and inflation targeting was the right decision. However, those monetary policy issues pertinent to EMU that are given broad media coverage these days must not obscure more fundamental international monetary policy challenges. The danger of the liquidity trap in Japan, the risks of asset price bubbles in the U.S.A. and the possible existence of a New Economy are examples of challenges that monetary policy has to face worldwide at the start of the new millennium.

The Eurosystem is seeking to achieve credibility for its monetary policies. The Eurosystem is not bound in its monetary strategy to any explicit rules, nor is it subject to optimal contracts like those often recommended by the academic literature. Inevitably, its credibility after the first year of operation primarily takes the form of reputation, that is, credibility without binding mechanisms.

The Eurosystem is attempting to establish a reputation on the basis of institutional independence and clear monetary objectives. The hope is that economic success in the initial phase will rapidly generate the necessary trust on the part of the population, agents on financial markets and politicians. The system will thereafter have an incentive not to lose the confidence thus acquired. Its reputation is inherently fragile, and does not necessarily represent a sufficiently binding policy commitment. The question as to the sustainability of this form of credibility is therefore the subject of a public debate, and of an academic controversy reflected in the literature.

The paper argues that institutional factors such as greater transparency and accountability, and friction-free coordination with other policies could contribute to increased credibility. The credibility of monetary policy, which is inseparable from that of economic policy as a whole, would be less crisis-prone as a result.

Most Eurosystem liquidity is provided to credit institutions through weekly tender procedures (main refinancing operations conducted with a maturity of two weeks), with monthly tenders (longer-term refinancing operations with a maturity of three months) providing the bulk of the remainder.

Those two types of regular reverse transactions may be supplemented by nonregular fine-tuning and structural operations. This category of instruments includes quick tenders, foreign exchange swaps, the collection of time deposits, outright transactions and the issuance of ECB debt certificates.

With the aim of stabilizing market rates, credit institutions in the euro area are required to hold minimum reserve balances (set at 2% of all deposits and of debt issued with a maturity of less than two years, excluding repos and interbank liabilities) which are remunerated at the average of the rate for main refinancing operations over the maintenance period.

The money market has shown a marked degree of integration for unsecured transactions. This has also changed the size of deals and business partners for Austrian banks. The secured segment of the market, by contrast, still has room for further integration.

Venture capital employed for young enterprises' startup financing and early-stage expansion accounts for just a minor share of the investments which provide important stimuli for innovation, growth and employment. Innovative small and medium-sized enterprises (SMEs) are one of the main engines driving growth and employment across Europe. In Austria, the venture capital market is still relatively small by international standards, yet it has been gaining considerable momentum in the past few years — not least owing to the fact that the focus of assistance schemes has shifted from debt financing towards equity capital. Differences evident in the investment structures in Austria and Europe as a whole may serve as an indicator of future developments on the equity front: In 1998, private households held merely 8% of the shares issued in Austria. The banks' predominant role in the Austrian venture capital market is reflected by their substantial holdings of shares issued by corporations in general. Moreover, by international comparison, institutional investors play a subordinate role, which, to a significant extent, is no doubt attributable to the structure of the Austrian pension insurance system. The study shows that Austrians have a keen interest in risk capital, both on the part of issuers and investors.

Based on time series analysis, this study examines the risk inherent in a representative portfolio. The portfolio comprises shares from North America, Asia Pacific, Eastern Europe and the euro area. It also includes German government bonds. To measure risk, a Capital Asset Pricing Model (CAPM) based on a multivariate GARCH structure is estimated. The most important finding is that the risk of the assets examined is distinctly time dependent, with the Eastern European shares fluctuating most sharply. Also, the risk measures studied reflect the lasting impact the Russian financial crisis had on capital markets. The modified model presented in the study reproduces the time dependence of the variances in nine out of ten cases. Evaluating the model by risk management standards attests to the good fit of the model, whose

VaR estimates plot the actual losses correctly through time. Covariance forecasting concludes the empirical exercise. It is evident that only the GARCH covariance does not show a systematic forecasting error.

> *One of the crucial aspects of the "takeover fever" in the banking sector is merger control. In Austria, this cartel law issue became the focus of public attention when the merger between Bank Austria and CA was approved by the European Commission only after adequate legal arrangements had been made by the parties concerned. The merger control authority examines concentrations from a competition law perspective if a "specified dimension" is reached, with the criteria being the turnover of the undertakings concerned and of their affiliated undertakings. In the banking sector, turnover is not suited as a quantitative indicator of the economic power of an undertaking. For this reason, both the EU Merger Regulation and the Austrian Cartel Act contain special provisions for the calculation of the notification thresholds, which are based on the sum of certain income items as defined in the Bank Accounts Directive as a turnover proxy. The study represents an extensive discussion of this calculation method.*

The opinions expressed in the section *"Studies"* are those of the individual authors and may differ from the views of the Oesterreichische Nationalbank.

Supplements
Austrian Outward and Inward Direct Investment at the End of 1998

Editorial

The Monetary Policy of the Eurosystem

One and a half years after the launch of European Monetary Union (EMU), media interest has come to focus on how the new system of the single European monetary policy and the institutions created for this system have operated so far. To sum it up, the Eurosystem has performed convincingly in the first 18 months of its existence: The inflation rate has been kept at a very low level, the unemployment rate is going down, and the relations between the Eurosystem and fiscal or wage policymakers have been marked by a general absence of friction.

For this issue, we have compiled a number of contributions that analyze the design and implementation of the monetary policy strategy of the Eurosystem, looking at the topic from various angles and using a variety of methodological approaches. Rather than attempting to offer a conclusive assessment of the Eurosystem's monetary policy – which cannot be delivered at the current juncture given the time lag with which monetary policy measures take effect and in light of the fact that EMU is still young – the articles provide an overall snapshot the details of which will be filled in at a later point. The main aim of this Focus issue is to provide input to an analytically substantiated discussion of the monetary policy of the Euro-system, thereby enhancing the transparency of monetary policy.

The Eurosystem's monetary policy strategy, which integrates monetary targeting and inflation targeting components, has so far served the Eurosystem well in mastering the challenges of EMU. Now it is important to give heightened attention to the fundamental challenges that monetary policy faces at the beginning of the new millennium, as *Peter Mooslechner* points out in his contribution. The issues that need to be addressed range from the threat of Japan falling into a liquidity trap, to the risk of asset price bubbles bursting in the U.S.A., and to the implications of the existence of a "new economy."

In the discussion about the Eurosystem's monetary policy, credibility plays a very important role. *Martin Schürz* explores analytical approaches to evaluating credibility and discusses a number of institutional factors that affect the credibility of monetary policy, such as transparency and accountability.

Money has been assigned a prominent role in the Eurosystem's monetary policy strategy. As the broad monetary aggregate M3 has exceeded the reference value since the beginning of 1999, *Peter Brandner* and *Helene Schuberth* look into the question as to whether a monetary overhang has built up that may spur inflation. The authors use a time series model to show that special factors have distorted monetary growth upwards.

Financial market players observing the Eurosystem's monetary policy, like Fed watchers in the U.S.A., build their interest rate expectations to no small extent on how they assess the performance of numerous inflation indicators. One of the pitfalls of assessing such clues are that they may be misconceived – a case in point is the development of the exchange rate of the euro. *Claudia Kwapil* discusses the significance of some major inflation indicators of the second pillar of the Eurosystem's monetary policy strategy and investigates them for their information content. The author explains

why the Eurosystem needs to rely on the assessment of a wide range of indicators for its monetary policy decisions.

Another analytical approach to evaluating the monetary policy of the Eurosystem is to look into the possibility of applying a rule to describe the decisions of the Eurosystem. *Friedrich Fritzer* applied a modified Taylor rule and concludes that a Taylor rule delivers an adequate description of the Eurosystem's policy in its early stage. No statistically significant evidence of a difference between the monetary policy before and after the implementation of Stage Three of Monetary Union was found.

Finally, a new operational framework for the implementation of monetary policy was put in place upon the transition to Stage Three of EMU. *Michael Pfeiffer* in his article focuses on the structural changes Austrian credit institutions have faced since then. He concludes that the Austrian banks have coped very well with the new regime. Even smaller banks have been participating in the regular main refinancing and the longer-term refinancing operations of the Eurosystem. Austrian credit institutions have, moreover, intensified their cross-border trading activities markedly.

Martin Schürz
Focus issue coordinator

Reports

Calendar of Monetary and Economic Highlights

Austria

June 2000

8   Following the monetary policy decisions taken by the Governing Council of the ECB on June 8 and earlier on April 27, 2000 – which add up to a 0.75 percentage-point increase in the Eurosystem's *key interest rates* – the following adjustments take effect in Austria as from June 9, 2000 in line with the euro-related amendment to civil legislation (Federal Law Gazette I No. 125/1998): The *base rate* is raised to 3.75% and the *reference rate* to 5.50%. In both cases this represents a rise by three quarters of 1 percentage point.

15/16 The *Oesterreichische Nationalbank* hosts its *28th Economics Conference,* which this year has been organized under the motto "The New Millennium – Time for a New Economic Paradigm." The conference convenes high-ranking representatives of the banking industry, international organizations, academia and politics. Governor Liebscher reiterates the importance of maintaining price stability and demonstrates optimism about Europe's potential for creating a "new economy."

30   Federal Law: *Amendment to the Banking Act* (Federal Law Gazette I No. 33/2000). The Austrian Banking Act is amended to reflect the abolition of anonymous savings accounts, changes in provisions for commodities futures to ensure compliance with the Capital Adequacy Directive II of the EU and to adapt banking legislation to EU-compliant provisions for consumer credits.

European Union

May 2000

5   Willem F. Duisenberg, *President of the European Central Bank (ECB),* makes a statement on the current development of the euro's exchange rate, addressing the concerns many European citizens have about the value of their currency. The President understands those concerns, but says that citizens should feel reassured by the fact that prices are stable in the euro area. Mr. Duisenberg recalls that the ECB has increased interest rates four times over the past six months and reiterates that the Bank will continue to do all it can to counter risks to the internal stability of the euro. European citizens can, thus, be assured that the future of the euro is that of a strong currency.

11   The *Governing Council of the ECB* decides to keep the interest rates for the Eurosystem's main refinancing operations, the *marginal lending facility* and the *deposit facility,* on hold, i.e. at a level of 3.75, 4.75 and 2.75%, respectively. ECB President Duisenberg explains that the Eurosystem needs to be alert given the abundance of liquidity in the markets. All available indicators and forecasts seem to point to a phase of continued economic growth. The President will not rule out a switch from fixed-rate tenders to variable-rate tenders.

18   With an overwhelming majority, the *European Parliament* votes to welcome *Greece* into the *euro area* as from January 1, 2001, since

Greece has fulfilled all formal criteria for accession as laid down in the Maastricht Treaty. The final decision on accession will be taken by the heads of state or government of the EU Member States at the EU summit meeting in Feira on June 19 and 20, 2000.

The Advocate General of the *Court of Justice of the European Communities* delivers his opinion on the case of Austria's anonymous savings accounts. The Advocate General rules that the *Republic of Austria* has failed to meet its obligations under the *EU money laundering directive*. He rejects the plea that Austria lodged against an elimination of such accounts.

25   At its meeting (held in the form of a teleconference), the *Governing Council of the ECB* decides that the interest rates on the main refinancing operations, the marginal lending facility and the deposit facility will remain unchanged at 3.75, 4.75 and 2.75% respectively.

30   The *European Commission* submits a recommendation, proposing that *Greece* enter the European Monetary Union at an initial rate of 340.75 GRD/EUR, which corresponds to the euro central rate of the Greek currency in the European Exchange Rate Mechanism II.

June 2000

4/5   The main items on the agenda of the *meetings of the ECOFIN Council* (Council of Economic and Finance Ministers of the EU states) *and the Euro-11 group* (which comprises only the ministers of the euro area states) are the budget policies of the participating Member States, the Broad Economic Policy Guidelines, the issuance of euro area coin samples, negotiations on the taxation of savings income, statistical requirements within Economic and Monetary Union (EMU) and support for Montenegro.

8   The ECB raises the Eurosystem's official rates by ½ percentage point each: *the interest rate on the main refinancing operations* to 4.25%, *the interest rate on the marginal lending facility* to 5.25% and *the interest rate on the deposit facility* to 3.25%. In addition, the ECB announces a switch from fixed-rate tenders to variable-rate tenders in its main refinancing operations.

9   In the *OECD's* latest economic survey, the *United Kingdom* wins plaudit for the transparency of its monetary and fiscal policy. The government is recommended to continue with its policy of structural reform. At the current juncture, the OECD sees only a few obstacles left that stand in the way of EMU entry.

15   The *Financial Action Task Force (FATF)* reaffirms the membership of *Austria* in the Paris-based task force of the OECD. Reaffirmation comes after Austria announced plans for a step-by-step abolition of anonymous savings accounts. The FATF stresses that it will monitor the implementation of the planned measures closely.

19/20   The outcome of the *European Council meeting in Feira* is as follows: Regarding the taxation of savings income, the EU heads of state or government settle on a system based on the exchange of information between banks and tax offices on the interest credited

to non-EU residents, to be implemented after a transition period of seven years.

Furthermore, the European Council gives the green light for the *accession of Greece to the Eurosystem* as from January 1, 2001. The exchange rate of the Greek drachma to the euro is irrevocably fixed at 340.75 GRD/EUR, which equals the central parity rate.

The *European Council* also confirms the *2000 Broad Economic Policy Guidelines.* As growth remains strong, the Member States shall meet a budgetary position of close to balance or in surplus earlier than envisaged, namely "as a rule, in the year 2001."

21 The *Governing Council of the ECB* decides to keep the interest rates for the Eurosystem's main refinancing operations, the marginal lending facility and the deposit facility, on hold, i.e. at a level of 4.25, 5.25 and 3.25%, respectively.

The *Committee on Economic and Monetary Affairs* of the European Parliament adopts a resolution on the communications strategy for the final phase of Stage Three of EMU.

27 For the first time, the *ECB* conducts its *main refinancing operation* in the form of a *variable-rate tender.* The minimum bid rate for the transactions, which are concluded with a maturity of two weeks, was set at 4.25%. Overall the ECB allots EUR 99 billion at an average bid rate of 4.32%.

28 The *Bank of Greece* cuts its *key interest rates* by a range of 50 to 75 basis points. It lowers the *repo rate* for its 14-day refinancing operations to 8.25% and the *lombard rate* to 9%. Moreover, it adjusts the *rate for the overnight deposit facility* to 7.25%, abolishing the second tier of the facility altogether.

July 2000

1 France takes over the rotating *presidency of the Council of the European Union* from Portugal for the next six months. The major task of the French presidency will be to conclude the Intergovernmental Conference on the reform of the EU institutions. While presiding over the ECOFIN Council, France wishes to improve the coordination of Member States' policies particularly among the euro area states, seek progress in aligning financial markets regulation, implement a more ambitious European innovation policy, and tackle practical issues of the introduction of euro notes and coins.

10 In its resolution on the Annual Report of the ECB, the *European Parliament* gives the ECB credit for having conducted a successful monetary policy in 1999 and calls upon the ECB to keep its policy geared to maintaining price stability.

11 The *European Central Bank* allots EUR 99 billion to bidders in settling its latest main refinancing operation, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation is 4.30%, the marginal rate 4.29%, and the allotment ratio 95.72%.

13   The *European Central Bank* announces that 14.545 billion banknotes representing a nominal value of EUR 616 billion will be printed before the launch date of January 1, 2002. 10 billion banknotes are expected to be put into circulation in the first weeks of 2002 to replace the national banknotes and 4.5 billion are considered logistical stocks.

16   For the first time a Greek delegation attends the *euro group meeting* on the eve of the ECOFIN Council. Among other things, the discussion centers around Article IV consultations with euro area countries and preparations for the physical introduction of the euro.

17   The main items on the agenda of the *ECOFIN Council* are the program of the French presidency, the tax package, the money laundering directive as well as the adoption of the terms of reference for the Committee of Wise Men set up to help pave the way for a single securities market.

25   The *European Central Bank* allots EUR 118 billion to bidders in settling its latest main refinancing operation, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation is 4.31%, the marginal rate 4.30%, and the allotment ratio 69.59%.

26   The *European Commission* submits a proposal for a Council regulation on protecting the euro against counterfeiting.

28–30 Martti Ahtisaari, Jochen Frowein and Marcelino Oreja, the *three wise men* commissioned by the EU-14 to draft a report on the political situation in Austria, visit Vienna to hold talks with representatives of the federal government, all four political parties represented in Parliament, the Church and the trade unions. The report may be ready by September.

August 2000

1   In its quarterly review, the *European Commission* reports that use of the euro has been mounting considerably in most Member States. Almost 25% of national and 42.2% of international payments by firms are made in euros. Austrian firms are still reluctant to use the euro: Only 0.35% of national and 7% of international payments are made in euros.

The *European Central Bank* allots EUR 45 billion to bidders in settling its *main refinancing operation* with a maturity of two weeks, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation and the marginal rate are 4.31%. A total of 710 credit institutions submits bids worth EUR 172.2 billion at rates between 4.25 and 4.45%.

2   The *Eurobarometer* survey conducted by the European Commission in May 2000 showed that 58% of EU citizens *support the introduction of the euro,* while 33% are against it. In Austria, 48% are in favor of the single currency, 38% oppose it (compared to 58% and 30%, respectively, at the end of 1999). The *euro enjoys most support* in Italy (81%), Luxembourg and Belgium (76%) and Spain (75%). Among

the smaller EU countries, support for the euro seems to be dwindling. Turning to enlargement, only 27% of EU citizens think that the accession of new Member States should be a priority. Support for enlargement is strongest in Denmark (57%) and Greece (53%).

4   The *Deutsche Bundesbank* has launched a new series of publications entitled "Euro 2002 – Information on the Introduction of Euro Cash." "Euro 2002" issues can be downloaded from the Internet under www.bundesbank.de (in German only).

8   The *European Central Bank* allots EUR 111 billion to bidders in settling its *main refinancing operation* with a maturity of two weeks, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation is 4.31%, the marginal rate 4.30%. A total of 741 credit institutions submits bids worth EUR 199.9 billion at rates between 4.25 and 4.50%.

14   The *European Central Bank* allots EUR 54 billion to bidders in settling its *main refinancing operation* with a maturity of two weeks, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation is 4.37%, the marginal rate 4.35%. A total of 590 credit institutions submits bids worth EUR 173.9 billion at rates between 4.25 and 4.42%. Since Tuesday was a holiday in some countries of the euro area, the allotment took place already on Monday.

22   The *European Central Bank* allots EUR 113 billion to bidders in settling its *main refinancing operation* with a maturity of two weeks, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation is 4.50%, the marginal rate 4.47%. A total of 786 credit institutions submits bids worth EUR 218.1 billion at rates between 4.25 and 4.61%.

28–30   At the *banking seminar of the European Forum Alpbach conference,* OeNB Vice Governor Tumpel-Gugerell emphasizes the newly evolving tasks for financial service providers (e.g. e-banking supervision).

29   The *European Central Bank* allots EUR 68 billion to bidders in settling its *main refinancing operation* with a maturity of two weeks, carried out as a variable rate tender with a minimum bid rate of 4.25%. The weighted average rate of the operation is 4.71%, the marginal rate 4.68%. A total of 649 credit institutions submits bids worth EUR 149.9 billion at rates between 4.25 and 4.85%.

31   The *Governing Council of the European Central Bank* takes the following monetary policy decisions: The minimum bid rate on the *main refinancing operations* of the Eurosystem will be raised by 0.25 percentage point to 4.5%, starting from the operation to be settled on September 6, 2000. The interest rate on the *marginal lending facility* and the interest rate on the *deposit facility* will also be raised by 0.25 percentage point to 5.50 and 3.50%, respectively, with effect from September 1, 2000.

As the *European Central Bank* reported on July 11, 2000, there had been problems concerning the quality of *EUR 100 banknotes* produced in a German printery. The ECB announces that a process has been developed to ensure that these EUR 100 notes are made fully compliant with the required quality standards.

Economic Outlook for Austria
from 2000 to 2002 Spring 2000

Pickup in goods exports fuels solid economic growth

1 Summary

The Austrian economy has been on an upswing since the second half of 1999. As the global economy recovered faster than anticipated, and as the economies of Germany and Italy, Austria's key trading partners, also expanded, Austria's real GDP growth came to 3.2% in the fourth quarter of 1999. Private consumption was the main driving force behind the upswing in 1999. Exports, on the other hand, had plummeted at the end of 1998 as a result of the international financial crises. Towards the end of 1999, however, global recovery and an expanding European economy fueled export demand.

This year, the worldwide recovery, above all the upturn in the euro area, are going hand in hand with a significant increase in export demand, which is gaining additional momentum from the competitive prices and on account of the euro's exchange rate. Rising sales in goods exports are generating solid output growth in manufacturing. Domestic demand is also continuing to increase. Brighter sales forecasts for companies, relatively low interest rates and higher corporate profits are boosting investment. Moreover, growth in private consumption remains high, as employment is picking up and the tax reform package is adding to private household incomes. Thus, a real GDP growth rate of 3.4% is projected for 2000. In 2001 and 2002, despite booming exports, fiscal consolidation measures and their effects on disposable incomes and on private consumption will bring down economic growth to 2.9 and 2.6%, respectively.

Calculated on the basis of the oil price developments and the effects of scheduled increases in indirect taxes and fees, the CPI deflator will climb from 0.7% in 1999 to 1.8% in 2000. Slightly slower domestic demand growth, falling oil prices and lower nonwage labor costs will drive down inflation to 1.4% in 2001 and 1.5% in 2002.

Since the deficit on the income account is going up and although exports are booming, the current account deficit will shrink by no more than 0.2 percentage point from 2.8% of GDP in 1999 to 2.6% in 2000. The current account deficit is expected to sink to 2.4 and 2.2% of GDP in 2001 and 2002, respectively.

With export and domestic demand – especially for services – remaining buoyant, the labor market will continue to be strong until 2001. Despite cyclically weaker growth in employment in 2002, the unemployment rate (EU definition) will go down from 3.7% (1999) to 3.3% in 2002.

2 International Economic Environment

The international economic outlook remains bright. The U.S.A. has experienced a continuing upswing for the past nine years. Real economic growth was measured at 4% in 1999. International forecasts predict a soft landing for the U.S. economy in the next few years.

After a temporary upturn in the first half of the year, Japan's output declined by an annualized rate of 2.7% in the second half of 1999 compared to the same period of the previous year. More favorable corporate profit prospects and rising business confidence indicate that an investment cycle is about to start.

The Southeast Asian countries most severely hit by the economic and financial crisis of 1997/98 seem to be recovering much faster than originally expected. Apart from increased stockbuilding, exports, which are booming thanks to the upswing in the U.S.A. and Europe, remain the pillars of economic expansion in these countries.

More animated domestic demand and an upbeat export forecast should also take Latin America back to a path of higher growth.

In spite of a mixed economic development in the region, the Commonwealth of Independent States (CIS) and the Central and Eastern European countries (CEECs) can also expect more vigorous economic growth over the next few years. Especially the CEECs will benefit from stronger domestic demand in the European Union.

Table 1

Economic Environment

	1999	2000	2001	2002
	Annual change in %			
GDP growth				
U.S.A.	+4.1	+4.2	+3.0	+3.3
Japan	+0.3	+1.1	+1.5	+2.3
CEECs and CIS	+2.2	+2.9	+3.2	+3.3
	% p. a.			
Interest rates				
Three-month rate	2.96	4.02	4.18	4.18
Ten-year rate	4.68	5.56	5.62	5.67
	USD			
Oil price	17.8	23.5	20.9	19.2
	USD/EUR			
Exchange rate	1.067	0.920	0.891	0.891

Source: ECB.

The economic expansion in the euro area markedly accelerated towards the end of 1999. Industrial production gained considerable momentum, and the weakness of the euro has stimulated export demand as well as investment activity, especially in countries maintaining close trade relations with the U.S.A. In France, domestic demand is the main factor underpinning economic growth. Italy, which, just like Germany, was

Real GDP Growth

Annual change in %

Legend: 1999, 2000, 2001, 2002

Source: ECB, OeNB.
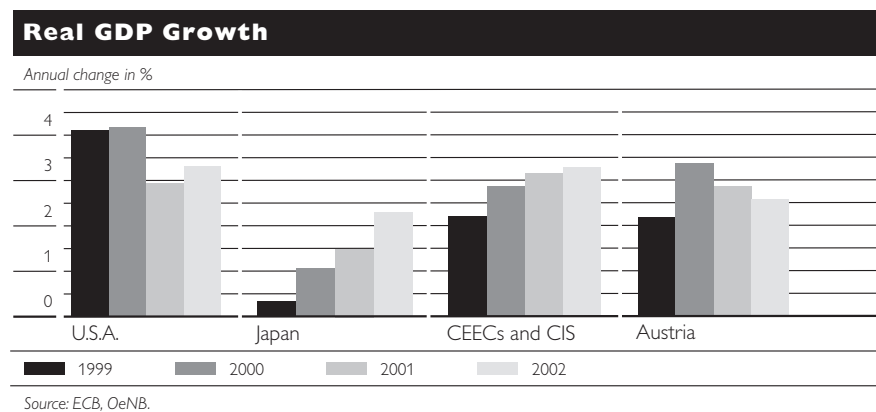
lagging behind in 1999, is also showing signs of recovery. Germany's weak domestic demand, on the other hand, which still carries the burden of unification and fiscal consolidation measures, does not seem to be picking up. Though exports and thus manufacturing are booming, overall economic growth in Germany will continue to fall short of growth rates in other European countries.

The forecast is subject to a caveat, as the three-month interest rates and exchange rates (i.e. external variables) used in the calculation were set at 4.18% and 0.89 EUR/USD over the forecast horizon. Ten-year yields, based on a fictitious ten-year bond for the euro area, were set at 5.56, 5.62 and 5.67% for the years 2000 to 2002. The oil price assumptions are based mainly on the average oil prices on the futures markets in mid-April 2000. Accordingly, it is assumed that over the forecast horizon, oil prices will gradually drop from USD 23.5 per barrel to USD 19.2 per barrel.

3   Economic Outlook for Austria

Pickup in goods exports fuels solid economic growth

A number of favorable factors will boost economic activity in Austria over the forecast horizon 2000 to 2002: First of all, there are signs that export sales will augment significantly, with increased international demand, the favorable cost structure, i.e. more competitive prices, fueling exports of manufactured goods. At the same time, private consumption, which has been very strong for the past few years, will be fostered by fiscal policies, at least temporarily. The tax reform package and family benefits that entered into force on January 1, 2000, give an advantage to the demographic groups with a higher propensity to spend. Manufacturing and investment in plant and equipment had already started to recover in the last quarter of 1999. Therefore further increases can be expected. Taking into account all these factors, the OeNB forecasts a growth rate of 3.4% for 2000.

While the investment cycle will peak by 2001, the positive effects of the tax reform package on disposable incomes will be offset by fiscal consolidation measures. As a consequence, growth in private consumer demand will slow down. In 2001 and 2002, competitiveness will not improve at the same pace as in the previous year, that is market share gains on the goods export markets are expected to be somewhat lower. However, higher wage settlements following the upturn on the labor market as well as heightened demand as a result of rising corporate profits will stimulate domestic private demand. Hence, growth rates of 2.9 and 2.6% of GDP are projected for 2001 and 2002, respectively.

The acceleration of economic growth from 2.2% in 1999 to 3.4% in 2000 results roughly equally from both the rise in domestic demand and a boom in external trade. The increase in domestic demand in 2000, in turn, is made up of higher private consumption and brisk investment activity. In 2001, the contribution to growth of private consumption will shrink to 1.3 percentage points; the contribution from net exports will also diminish. Still, with the investment cycle going strong, investment will contribute to overall growth 1.0 percentage point in 2001, which means that compared to

Table 2

OeNB's Economic Outlook for Austria (May 2000)

	1999	2000	2001	2002
	Annual change in %			
Development of prices and costs				
Deflators				
Private consumption	+0.7	+1.8	+1.4	+1.5
Gross fixed capital formation	+0.7	+1.1	+1.1	+0.9
Gross domestic product	+0.6	+1.2	+1.1	+1.4
Imports total	+0.4	+5.6	+1.9	+1.2
Exports total	+0.6	+2.2	+1.2	+1.1
Terms of Trade	+0.1	−3.2	−0.7	−0.1
Unit labor costs[1]	+1.3	−0.6	+0.5	+0.9
Labor productivity	+0.7	+2.2	+2.0	+1.6
Gross wages per employee	+2.1	+1.6	+2.4	+2.6
Real wages per employee[2]	+1.4	+0.4	+1.3	+1.2
Composition of real GDP growth				
Gross domestic product	+2.2	+3.4	+2.9	+2.6
Private consumption	+2.4	+2.6	+2.4	+2.5
Government consumption	+0.8	+0.1	+0.1	+0.0
Gross fixed capital formation	+2.8	+3.9	+4.0	+3.4
Investment in plant and equipment	+4.9	+7.7	+7.6	+5.9
Construction investment	+1.2	+1.0	+1.2	+1.2
Exports total	+4.7	+7.0	+5.9	+5.6
Imports total	+3.5	+5.7	+5.0	+4.8
Domestic demand (excl. changes in inventory)	+2.2	+2.4	+2.4	+2.2
	% of GDP			
Current account plus financial account	−2.8	−2.6	−2.4	−2.2
Labor market				
Unemployment rate (Eurostat definition)	3.7	3.5	3.3	3.3
	Annual change in %			
Workforce	+1.4	+1.1	+1.0	+1.0
Private sector	+1.8	+1.4	+1.1	+1.3
Employment rate (SNA)	+1.8	+1.5	+1.2	+1.2

Source: OeNB spring 2000 forecast.
[1] Gross wages as a percentage of GDP.
[2] Total payroll per employee.

the previous year, economic growth will go down by no more than 0.5 percentage point to 2.9%. In 2002, private consumption will again make a larger contribution to economic growth. As the investment cycle draws to a close, domestic demand and import demand will be dampened. Lower import demand coupled with solid net export growth will keep the contribution of net exports to economic growth high in 2002.

Higher oil prices and excise tax hikes drive up consumer prices in 2000
High oil prices will boost consumer prices above all in the first half of 2000. Since stock levels are low and demand is seasonally on the rise, the oil price will decline only moderately in the second half. Moreover, projected increases in various excise taxes (on tobacco, power and car insurance) will generate inflationary pressures in the second half of the year. Yet wage restraint will have a positive effect on price developments; therefore, it can be assumed that consumer price inflation will climb by 1.8% in 2000. Falling oil prices and marginally higher wage settlements than in the

previous years will continue to determine price developments in 2001 and 2002. Upward pressures on prices as a result of higher wages are projected particularly toward the end of the forecast horizon. Prices are expected to remain stable throughout the forecast period.

Contributions to Austria's HICP by Selected Categories

Percentage points

Food, beverages and tobacco
Services
Energy
Industrial goods less energy
HICP

Source: OeNB.
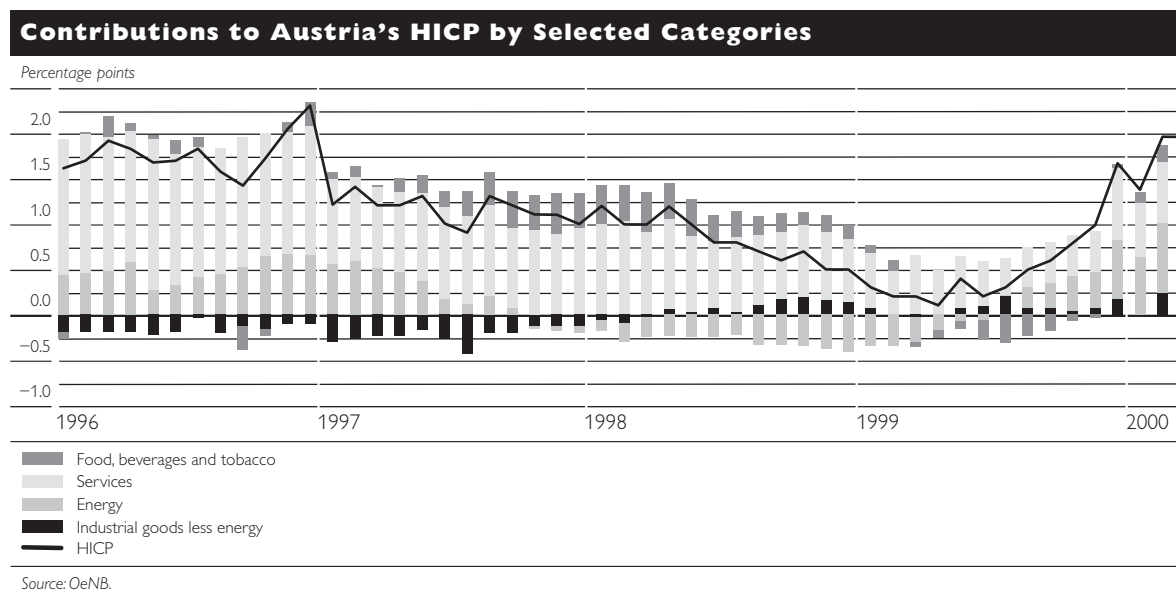
Economic upswing boosts employment

Robust domestic demand will stimulate employment throughout the forecast period. The unemployment rate (EU definition) will fall from 3.7% in 1999 to 3.3% in 2002, which is partly because labor supply will not climb as fast as labor demand. Gains in labor productivity (contribution to GDP per employee) remained below the long-term value of 2% since increases in employment between 1997 and 1999 consisted primarily of mounting demand for part-time employees and casually employed persons. Yet booming exports, hand in hand with positive effects on manufacturing, are expected to boost full-time employment throughout the forecast horizon, which, in turn, will also push up labor productivity this year.

In 2001 and 2002, the government's fiscal consolidation measures will have various impacts on the labor market: On the one hand, the dip in private consumption will bring down workforce demand; on the other hand, the planned measures to enhance Austria's competitiveness should make Austria more attractive to investors and thus also stimulate employment. Toward the end of the forecast horizon, heftier salary and wage hikes will act as dampener on employment.

Raising the legal retirement age as well as opening the labor market to seasonal workers in the tourist industry will slightly augment workforce supply in 2000 and 2001. At the same time it is unlikely that in the light of fiscal consolidation plans, the government will take additional active labor market measures and that a growing number of unemployed will have the opportunity to participate in retraining schemes.

Net exports have positive impact on current account

According to the OeNB's forecast, Austria's competitiveness vis-à-vis its most important trading partners in the euro area will improve considerably in 2000. Although Austrian export prices for the most part only reflect the weighted import prices of its main trading partners, increases in costs in Austria will have an impact on export prices. Import prices, on the other hand, are determined by the oil price and the exchange rate changes of the euro. Thus, the more moderate increase in export prices than in import prices will cause the terms of trade[1] to deteriorate.

The OeNB outlook expects exports to expand more rapidly than imports throughout the forecast period. Having established firm trade relations with the Central and Eastern European Countries, Austrian enterprises will profit from the upswing in this region, even though some uncertainties about the development of these economies persist. The buoyant growth in imports is a result of strong domestic demand; in other words, solid private consumer demand in the first half of 2000 and bustling investment activity in the second half of 2000 will boost import growth. However, as domestic demand tapers off towards the end of the forecast horizon, import growth is also expected to slow down.

Owing to a higher deficit on the income subaccount (especially the shortfall on incomes on interest-bearing financing instruments[2]), the deficit on the current account widened by ATS 15 billion to 2.8% of GDP in 1999 compared to 1998. Although a turnaround in the income subaccount is not in sight, the favorable development in external trade will bring down the deficit on the goods and services subaccounts and, eventually, will marginally reduce the current account deficit in the next few years.

4 Risks

This forecast assumes that service export growth will lag behind export market growth. However, enhanced competitiveness of services could boost exports and thus add to stronger overall economic growth.

The outlook expects a soft landing in the U.S.A. Yet the existing imbalance in U.S. external trade continues to pose a potential threat to the global economic development. If measures to redress the imbalance trigger severe recession in the U.S.A., the global economy will be harmed as well, which, in turn, will also impair Austria's export outlook. Any changes in the exchange rate of the euro against the U.S. dollar would also pose a risk to the outlook for exports.

In the main, the risks to the price forecast are upside risks. First, for the past few months, the oil prices have been higher than the forecast had assumed. At the beginning of June, the oil price was USD 29 per barrel, approximately USD 7 above the external assumptions. If the oil prices stagnate at a high level, inflation will climb more markedly in 2001 and

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1   The terms of trade express an index of the price of a country's exports in terms of its imports (i.e., export price index divided by import price index). The terms of trade deteriorate if a country's export prices do not increase as fast as the import prices.

2   This category comprises income on debt securities, deposits and loans.

2002. Second, the import price forecast is based on shrinking profit margins for companies outside the euro area exporting to Austria. If the profit margins do not decrease as much as expected, imported inflation will increase. At the same time, an appreciation of the euro could curb inflation.

Moreover, insecurity about how households will respond to the planned budget consolidation program adds to the upside risk for prices. While private consumption will be stimulated by family benefits, the tax reform package and higher employment, planned increases in charges and fees will diminish private household demand. In the past, people partly offset temporary reductions in disposable income by curbing their savings rate. If people do not dip into savings this time, consumer demand will plummet.

5 Other Forecasts – A Comparison

Like the OeNB, other national and international institutions expect the Austrian economy to pick up noticeably in 2000. For 2001, national forecasts predict a somewhat slower growth, whereas international institutions anticipate sustained growth. The projected growth rates for 2000 range from 2.8% (Institute of Advanced Studies, IHS) to 3.4% (OeNB), the rates for 2001 from 2.7% (IHS and Austrian Institute of Economic Research, WIFO) to 3.3% (IMF). All institutions agree that employment will rise but all forecasters reckon with far higher unemployment rates than the OeNB. This discrepancy can be traced to a revision of the unemployment rate from 4.4 to 3.7% in April, which the institutions had not been able to consider in their forecasts yet. There is also unanimity about the development trend of the inflation rate. All forecasts assume that in 2000, higher oil prices and the scheduled tax hikes will push up inflation a bit, and that the rate will decline again in 2001. While the OeNB inflation at 1.8% for 2000, all the other institutions expect lower rates, such as 1.2% (European Commission) and 1.6% (WIFO). The differences in inflationary expectations are traceable to differing assumptions on the euro exchange rate and thus the share of imported inflation in total inflation. While the OeNB's outlook assumed an exchange rate of USD/EUR 0.89 for 2000, the European Commission set the exchange rate at USD/EUR 0.98 and WIFO at USD/EUR 1.0.

6   Annex

Table 3

Austria's Key Macroeconomic Indicators

	OeNB May 2000			WIFO April 2000		IHS April 2000		EU Commission April 2000		IMF April 2000	
	2000	2001	2002	2000	2001	2000	2001	2000	2001	2000	2001
	Annual change in %										
Real GDP	+3.4	+2.9	+2.6	+3.1	+2.7	+2.8	+2.7	+3.2	+3.0	+3.1	+3.3
Private consumption, in real terms	+2.6	+2.4	+2.5	+2.7	+2.3	+2.6	+2.4	+2.7	+2.2	×	×
Gross fixed capital formation, in real terms	+3.9	+4.0	+3.4	+3.6	+3.7	+3.6	+3.4	+5.1	+4.8	×	×
Exports of goods and services, in real terms	+7.0	+5.9	+5.6	+5.5	+5.6	+6.9	+6.0	+9.0	+8.2	×	×
Imports of goods and services, in real terms	+5.7	+5.0	+4.8	+5.1	+4.9	+5.8	+5.2	+8.4	+7.2	×	×
GDP deflator	+1.2	+1.1	+1.4	+1.4	+1.4	+1.2	+1.2	+0.6	+0.8	+1.5	+1.7
Private consumption, price deflator	+1.8	+1.4	+1.5	+1.6	+1.4	+1.5	+1.4	+1.2	+1.1	×	×
CPI	×	×	×	+1.6	+1.4	+1.5	+1.4	+1.3[1]	+1.0[1]	×	×
Unit labor cost (all sectors)	−0.6	+0.5	+0.9	−0.2	+0.7	×	×	×	×	×	×
	%										
Unemployment rate (Eurostat definition)	3.5	3.3	3.3	4.2	4.1	4.1	3.9	4.0	3.6	4.0	3.9
	% of GDP										
Current account	−2.6	−2.4	−2.2	−2.2	−2.0	−2.0	−1.9	×	×	−1.9	−1.0
General government deficit	×	×	×	−2.0	−2.0	−1.7	−1.5	−1.7	−2.0	−1.7	−1.5
	USD/barrel										
Oil prices	23.5[2]	20.9[2]	19.2[2]	24.0	21.0	24.0	23.0	×	×	×	×
	% p. a.										
Long-term interest rate	5.6[2]	5.6[2]	5.7[2]	5.8[3]	5.6[3]	5.0	4.5	×	×	×	×

Source: OeNB, WIFO, IHS, EU Commission, IMF.
[1] *Harmonized CPI.*
[2] *ECB data.*
[3] *Benchmark.*

Table 4

Demand Components (in Real Terms)

At 1995 prices

	1999	2000	2001	2002	1999	2000	2001	2002
	ATS million				*Annual change in %*			
Private consumption	1,432,323	1,469,810	1,505,273	1,542,463	+2.4	+2.6	+2.4	+2.5
General government consumption	501,800	502,111	502,626	502,615	+0.8	+0.1	+0.1	+0.0
Gross fixed capital formation	622,853	647,288	673,366	696,225	+2.8	+3.9	+4.0	+3.4
Domestic demand (excl. changes in inventory)	2,556,976	2,619,209	2,681,265	2,741,302	+2.2	+2.4	+2.4	+2.2
Exports total	1,200,461	1,284,573	1,359,894	1,436,294	+4.7	+7.0	+5.9	+5.6
Imports total	1,183,219	1,250,495	1,312,691	1,375,844	+3.5	+5.7	+5.0	+4.8
Net exports	17,242	34,078	47,203	60,451	×	×	×	×
Gross domestic product	2,575,976	2,662,987	2,740,868	2,812,753	+2.2	+3.4	+2.9	+2.6

Source: OeNB spring 2000 forecast.

Table 5

Demand Components (at Current Prices)

	1999	2000	2001	2002	1999	2000	2001	2002
	ATS million				*Annual change in %*			
Private consumption	1,511,361	1,577,951	1,638,315	1,704,661	+3.1	+ 4.4	+3.8	+4.0
General government consumption	528,700	536,154	543,120	550,230	+2.4	+ 1.4	+1.3	+1.3
Gross fixed capital formation	653,000	685,652	721,328	752,870	+3.5	+ 5.0	+5.2	+4.4
Domestic demand (excl. changes in inventory)	2,693,061	2,799,758	2,902,762	3,,007,760	+3.0	+ 4.0	+3.7	+3.6
Exports total	1,235,118	1,351,070	1,448,000	1,546,275	+5.3	+ 9.4	+7.2	+6.8
Imports total	1,233,546	1,379,445	1,475,691	1,565,505	+4.0	+11.8	+7.0	+6.1
Net exports	1,572	− 28,376	− 27,692	− 19,230	×	×	×	×
Gross domestic product	2,683,634	2,806,615	2,920,867	3,039,447	+2.8	+ 4.6	+4.1	+4.1

Source: OeNB spring 2000 forecast.

Table 6

Demand Components (Price Indices)

	1999	2000	2001	2002	1999	2000	2001	2002
	1995 = 100				Annual change in %			
Private consumption	105.5	107.4	108.8	110.5	+0.7	+1.8	+1.4	+1.5
General government consumption	105.4	106.8	108.1	109.5	+1.6	+1.3	+1.2	+1.3
Gross fixed capital formation	104.8	105.9	107.1	108.1	+0.7	+1.1	+1.1	+0.9
Domestic demand (excl. changes in inventory)	104.4	105.3	106.9	108.3	+0.8	+1.5	+1.3	+1.3
Exports total	102.9	105.2	106.5	107.6	+0.6	+2.2	+1.2	+1.1
Imports total	104.3	110.3	112.4	113.8	+0.4	+5.7	+1.9	+1.2
Terms of Trade	98.6	95.4	94.7	94.6	+0.1	−3.2	−0.7	−0.1
Gross domestic product	104.2	105.4	106.6	108.1	+0.6	+1.2	+1.1	+1.4

Source: OeNB spring 2000 forecast.

Table 7

Labor Market

	1999	2000	2001	2002	1999	2000	2001	2002
	Number				Annual change in %			
Workforce (total)	4,018,297	4,064,304	4,103,147	4,142,440	+1.4	+1.1	+1.0	+1.0
Private sector	3,253,319	3,298,275	3,335,584	3,378,546	+1.8	+1.4	+1.1	+1.3
Dependently employed (SNA definition)	3,249,183	3,297,274	3,338,298	3,379,772	+1.8	+1.5	+1.2	+1.2
	%							
Unemployment rate (Eurostat definition)	3.7	3.5	3.3	3.3	×	×	×	×
	1995=100							
Unit labor costs (all sectors)[1]	100.7	100.1	100.6	101.5	+1.3	−0.6	+0.5	+0.9
	At 1995 prices in ATS1,000							
Labor productivity (all sectors)	641.1	655.2	668.0	679.0	+0.7	+2.2	+2.0	+1.6
Real wages per employee[2]	419.3	420.9	426.4	431.3	+1.4	+0.4	+1.3	+1.2
	At current prices in ATS 1,000							
Gross wages per employee	436.8	443.6	454.3	466.0	+2.1	+1.6	+2.4	+2.6
	At current prices in ATS million							
Gross wages, total	1,419,323	1,462,694	1,516,800	1,575,108	+3.9	+3.1	+3.7	+3.8

Source: OeNB spring 2000 forecast.
[1] Gross wages as a percentage of GDP.
[2] Gross wages as a percentage of GDP deflator.

Table 8

Current Account

	1999	2000	2001	2002	1999	2000	2001	2002
	ATS million				% of GDP			
Current account	−74,559	−74,266	−69,182	−68,367	−2.8	−2.6	−2.4	−2.2

Source: OeNB spring 2000 forecast.

Money and Credit
in the First Quarter of 2000

Pronounced Growth of Total Assets

In the first quarter of 2000, Austrian banks' total assets soared, climbing by EUR 22.5 billion or 4.3% to EUR 547.1 billion since December 31, 1999, a first-quarter peak in ten years. Domestic and foreign business advanced at a faster clip than in the comparable periods of the past decade.

First Quarter-over-First Quarter Asset Growth

Total assets (left axis)
Share of foreign assets in assets growth (right axis)

Source: OeNB.
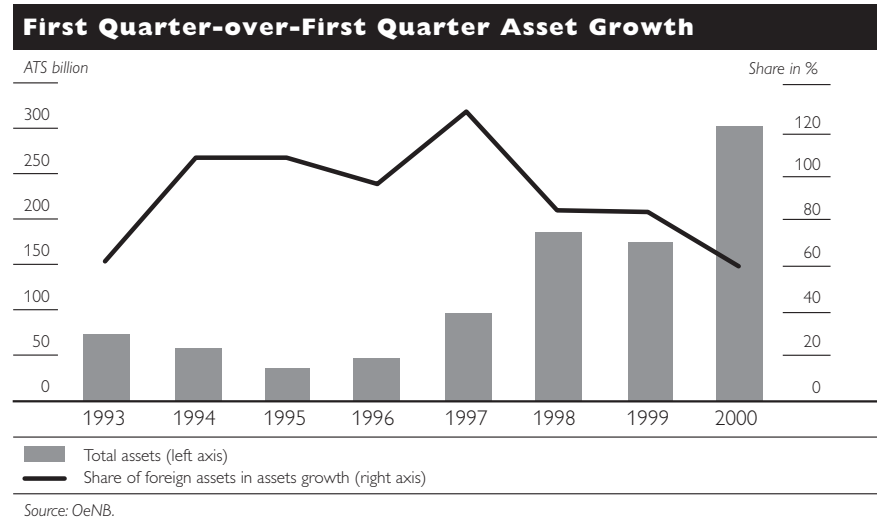
International operations accounted for just under two thirds of asset growth, domestic assets for slightly more than one third. In contrast to 1999, domestic interbank assets expanded powerfully in the first quarter of 2000. Domestic nonbank assets gained momentum as well, mainly in the wake of a marked recovery of domestic lending, which, for the first time since 1991, registered positive growth rates in the first quarter. However, external business still accounted for more than 80% of the rise in lending to nonbanks. In the same vein, about 70% of the expansion of securities and participations were traceable to international operations. Only the increment of interbank assets was mainly attributable to domestic operations, while external transactions accounted almost entirely for the net change in interbank liabilities. In the review period, Austrian banks likewise issued paper almost exclusively on international capital markets.

As for domestic assets in the first quarter of 2000, the significance of securitized and other lending to businesses continued to diminish relative to banks' total assets. Lending to the private and public sectors as well as interbank transactions were on the increase. Like in 1999, the contribution securitized financing made to growth surpassed its percentage in the volume outstanding on both the assets and the liabilities side. Deposits and loans, however, contributed much more strongly to asset growth and allocation in the period under review than in 1999. Investment in equities, above all mutual fund shares, lagged far behind the 1999 figures, sales of Austrian banks' direct paper also slowed down considerably on the year before. The share of foreign currency-denominated domestic loans remained at a very high level.

The number of independent banks remained unchanged at 951 in the first quarter 2000, the number of branch offices decreased by 8 to 4,568.

A total of 12 branches were newly established, 4 of which by savings banks and 5 by Raiffeisen credit cooperatives. Conversely, 20 branch offices were closed down, 12 branches of savings banks and 3 of building and loan associations. In January 2000, the Austrian share of MFIs doing business in the EU came to 8.5%, compared to 8.4% in January 1999.

Strong Revival of Austrian Banks' External Business

In the first quarter of 2000, Austrian banks stepped up their international exposure markedly. External assets and liabilities picked up by more than 10% each; yet, external business had been reduced substantially towards the end of 1999 to avoid millennium date change problems. The share of foreign assets in total assets went up by about 1½ percentage points to 26.6%. Loans to foreign nonbanks skyrocketed, outpacing the performance of the comparable 1999 period five times. Banks also invested more heavily in foreign securities and participations than in 1999. Interbank holdings at foreign banks, on the other hand, climbed more slowly than in the previous year, when Austrian banks had enhanced business with euro area partners given the emergence of a euro area-wide money market. The lion's share of the increase in credit extended to banks and nonbanks in the first quarter 2000 was registered in countries outside the euro area, mainly in important European financial hubs.

Growth in foreign liabilities largely stemmed from international money and capital markets. Interbank liabilities advanced 18%, i.e. at twice the speed year on year. Direct offerings in international markets picked up again after having plummeted in the first quarter of last year, with short-term securities replaced by long-term issues. These issues also served to refinance foreign currency loans, which remained on a stable growth path. As in 1999, deposits of foreign nonbanks receded.

Foreign branches of Austrian banks accounted for about 25% of the rise in international exposure. In the first quarter of 2000, their nonbank transactions surged above average: Branches abroad posted stronger growth in lending as well as in the acceptance of deposits than banks in Austria. When it comes to banks' direct offerings, foreign branches played a minor role though.

Foreign Currency Loans Picked up Speed

In the first quarter of 2000, demand for foreign currency loans gained further momentum, its rise exceeding all first-quarter data since the beginning of the series in 1988. When securitized assets[1]) are factored in, banks' outstanding loans[2]) to domestic nonbanks as well as loan portfolios increased by EUR 1.2 billion or 0.6% in comparison with year-end figures. Adjusted for interest charges, lending thus remained unchanged. Despite a

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1   *Debt securities not admitted to listing on the stock exchange.*

2   *Loans include all types of loans to resident and nonresident customers, regardless of classification. They also include both securitized and unsecuritized assets, but the latter only when the debt securities have not been admitted to listing on the stock exchange. (OeNB, Reporting guidelines for credit institutions' monthly returns pursuant to Article 74 paras 1 and 4 Austrian Banking Act, Vienna 1999, 22.)*

drop in the first quarter 1999, the annual lending growth rate accelerated slightly for three successive quarters, reaching 5.9%. Lending expanded entirely on the back of foreign currency loans. Foreign currency assets grew 10.8%, euro-denominated assets shrank by 1.3%.

Loans to Domestic Nonbanks

Annual change in %

Source: OeNB.
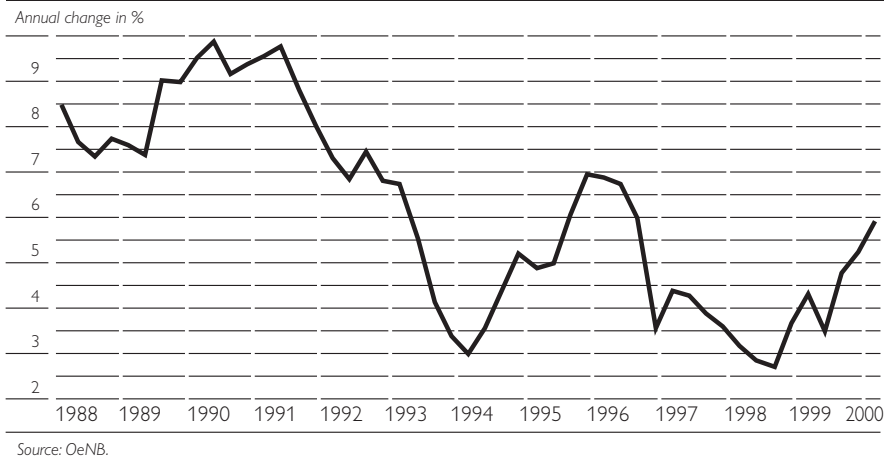
Loans to Nonbanks by Category

Annual change in %

Business
Households
Public sector

Source: OeNB.
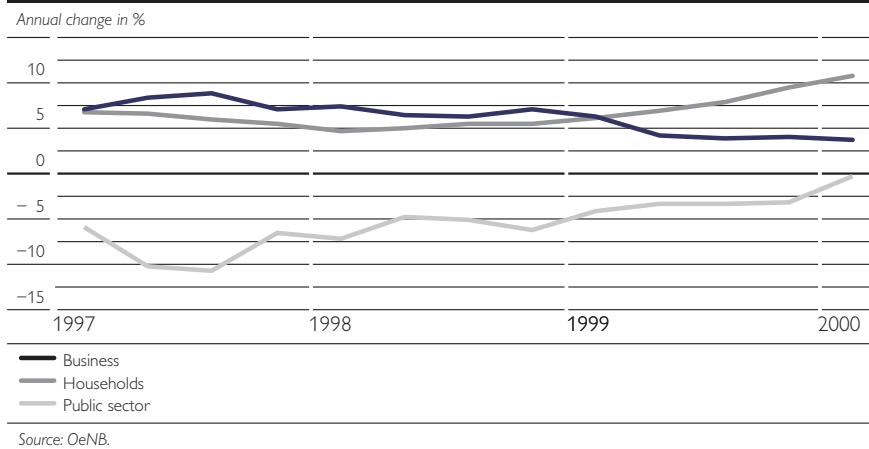
Austrian banks' lending rates remained on an uptrend. In March, commercial and private loans were offered at rates an average 0.3 percentage point higher than at the end of 1999. Since mid-1999 rates rose 0.7 and 0.78 percentage point, respectively, roughly equaling end-1998 levels.

Climbing interest rates did not, however, hamper credit growth. Loans to households showed buoyant 2.3% growth in the first quarter, mainly in the wake of lively demand for consumer durables. Home and home improvement loans progressed by 1.4%, compared to a decline in the first quarter of 1999. Loans extended by building and loan associations[1]) almost

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1   *Loans taken out under building and loan contracts after savings have reached the prescribed threshold.*

Austrian Banks' Lending Rates

Average in % p. a.

Source: OeNB.
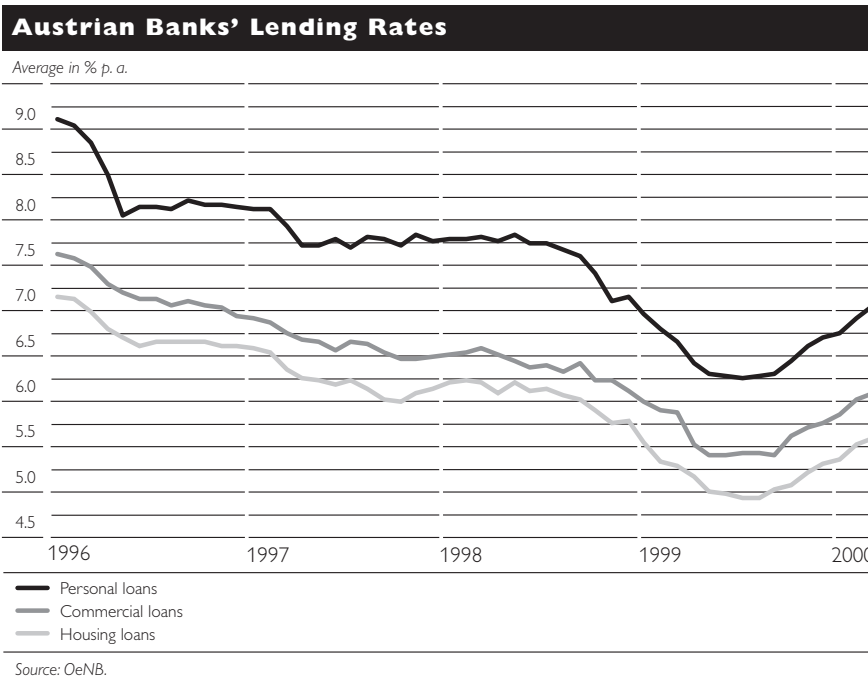
matched the sound performance of the previous quarter. Compared to the first quarter 1999, however, this loan category more than doubled as a result of the mid-1999 cut in interest rates.

Lending to businesses contracted 0.4% in the first quarter of 1999, as in 1998. Given advancing domestic demand and an improved international climate, the annual growth rate, which came to 4.0%, showed signs of improvement as of the middle of 1999. A temporary slump in self-financing in 1999[1]) might have hampered businesses' capability to finance investment projects from their own resources. Only few companies tapped domestic and international capital markets to raise funds, as was also evidenced by the low volume of debt securities issued in the first quarter.

In contrast to previous years, the public sector raised its borrowing from banks by 2.3% in the first quarter 2000. Loans to the federal government decreased, but those to state and municipal governments augmented. At the same time, the volume of government securities in domestic banks' portfolios moved up by 3.2%. In the first quarter 2000, overall bank lending to general government thus rose by 2.7% to EUR 52.2 billion.

Credit growth in 2000 can so far be traced almost entirely to nonrevolving loans, primarily cash advances. Current account credit and loans, on the other hand, declined. Discount loans became less attractive as a result of EMU-related changes in central bank refinancing and high handling costs, plummeting more than 10% in the first quarter. At the end of March 2000, they only stood at one third of their 1998 volume.

1   See Peneder and Pfaffermayr (2000). Temporäre Abschwächung der Selbstfinanzierungskraft 1999. In: WIFO-Monatsberichte 3, 181-189.

In the period under review, the upward trend of foreign currency loans prevailed. The rise of EUR 3.6 billion or 10.8% was an all-time high for first-quarter growth; foreign currency loans of domestic nonbanks picked up by more than 50% in the past 12 months. This trend may in part be attributed to changes in the euro exchange rate, but largely it was based on new contracts. Yen-denominated loans jumped 29% in the first quarter 2000, in which period the yen appreciated 4% against the euro. The volume of U.S. dollar loans surged 31%, the respective exchange rate changed by close to 5%. The Swiss franc loan portfolio expanded 4.8%, the Swiss franc advanced less than 1% against the euro. In March 2000, 69% of all foreign currency loans were denominated in Swiss franc, 25% in yen. This means that the yen share more than doubled within one year.

Foreign Currency Loans to Domestic Nonbanks
as at March 31, 2000

Share in %

JPY
21.6

USD
4.2

EU currencies
excl. EUR
1.1

other
0.1

CHF
73.0
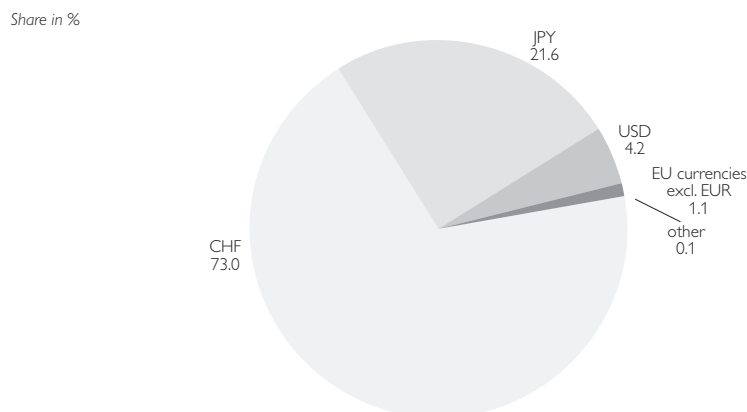
Source: OeNB.

So far, all types of borrowers have shown a preference for foreign currency loans this year: Businesses stepped up their foreign currency loan exposure by EUR 2 billion or 10%, while reducing euro-denominated loans by EUR 2.5 billion. More than 90% of household lending was denominated in foreign currencies. The same trend applied to the majority of new home and home improvement loans. In the first quarter 2000, the foreign currency share of private lending came to 19.4%, for the first time exceeding that of corporate loans (19.2%). New loans granted to state and municipal governments were also largely denominated in foreign currencies. The federal government and nonbank financial intermediaries reduced their total credit liabilities. However, their foreign currency loan exposure trended upwards, with euro-denominated loans decreasing.

This predominance of foreign currency loans has so far remained an Austrian phenomenon: In the first quarter 2000, Swiss franc-denominated loans granted by Austrian MFIs to domestic nonbanks accounted for 37.6% of total Swiss franc loans extended in the euro area. The Austrian share of yen-denominated loans amounted to 24.6% at the end of December 1999. Compared to lending within the euro area, the share of loans granted to domestic nonbanks in Austria came to just 3.2%.

At EUR 1.6 billion or 3.0%, the first-quarter increase of banks' domestic securities portfolios equaled only about half the rise in the first three months of 1999. The sluggish growth of mutual fund shares of EUR 0.2 billion or 2% – one tenth of the 1999 first-quarter figure – was largely responsible for this development. Banks' portfolio of shares contracted about 5%; Federal treasury bill holdings, on the other hand, grew vigorously. Advancing by 18%, banks' net acquisitions of bonds issued by Austrian businesses amounted to EUR 0.2 billion. Given the decline in corporate liabilities in the first quarter, the share of corporate bonds in Austrian banks' lending to businesses thus climbed 0.16 percentage point to 1.02%.

Healthy Growth of Short-Term Deposits Prevailed

Austrian nonbanks' deposits at credit institutions progressed EUR 2.7 billion or 1.6% since the beginning of 2000, up slightly on the first quarter 1999. In an environment of stable prices and low opportunity costs, the structure of deposits shifted further toward more liquid forms of investment. Deposits payable on demand[1] climbed 3.3%. Since the end of 1999, the share of deposits with maturities of up to one year edged from 67.3% up to 67.8% of total deposits.

From among the deposit categories, at 13.2%, time deposits expanded most powerfully. This rise was largely ascribable to the public sector, which scaled up account holdings by almost one third. Nonbank financial intermediaries also stepped up their time deposits. Businesses and households, on the other hand, showed merely sluggish time deposit growth, while markedly increasing their demand balances – businesses, albeit, to a lesser degree than households. The public sector scaled back demand deposits. On balance, demand deposits picked up 3.5% in the first quarter 2000.

By contrast, savings deposits contracted by –0.7%. Deposits under building and loan contracts dropped 0.6% since the end of 1999. Building and loan investment contracts went down 1.9%. New contracts were about level with the first-quarter figures of the past few years, with the total contract sum falling slightly short of the first quarter 1999.

Interest rates on savings deposits, like those on lending, trended upward in the first quarter of 2000. Interest on savings bonds picked up between 0.3 percentage point and 0.4 percentage point, depending on maturity; fixed-term savings accounts came to about half this rise. Interest on instant access savings deposits and personal checking accounts, though, did not yet show an uptrend.

In the first quarter 2000, about two thirds of the funds acquired by domestic nonbanks were traceable to deposits and one third to banks' issues of fixed-income securities, reversing the year-earlier proportions. However, securities launched by banks still had a much larger share in the increase than in the total volume, which came to just under 22% at the end of March. The rise in placements of domestic banks' direct paper was only just

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1   Demand deposits and instant access savings deposits.

First Quarter-over-First Quarter Deposits Growth
(ATS/EUR and Foreign Currencies)

ATS billion

Savings deposits
Time deposits
Demand deposits
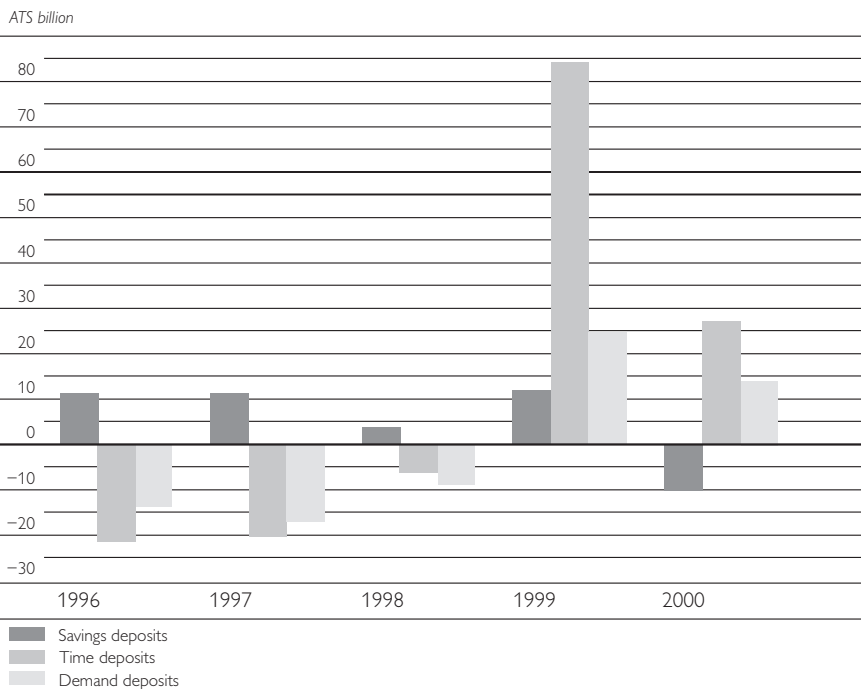
Source: OeNB.

half of the 1999 figure, with most of the increase coming from foreign currency-denominated securities. Bonds made up the bulk of new offerings; sales of mortgage bonds, municipal bonds and cash obligations, on the other hand, declined.

Austrian Banks' Deposit Interest Rates

Annual average in % p.a.

Personal checking accounts   Instant access savings deposits
Savings deposits up to 12 months   Savings deposits over 12 months
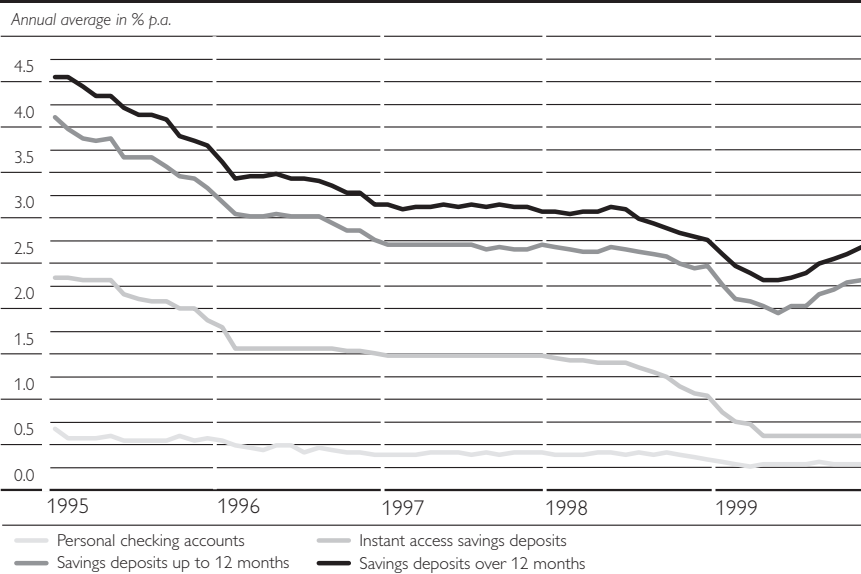
Source: OeNB.

Dynamic Expansion of Specific Off-Balance-Sheet Financial Transactions

Austrian banks expanded specific off-balance-sheet financial transactions[1]) by EUR 97 billion or 14.8% since the beginning of 2000. At EUR 753 billion, these transactions came to 138% of total assets, compared to 105% in 1999. Interest rate, exchange rate and gold contracts contributed most to this expansion. Banks also made extensive use of currency swaps to refinance foreign currency liabilities, turning to both basis swaps, i.e. floating for floating rate swaps, and fixed-floating swaps.

Capital Ratio at 13.7%

Austrian banks boosted their capital[2]) by EUR 1.3 billion to EUR 36.4 billion in the first quarter 2000. The calculation base rose by 5% at the same time, so that banks' capital ratio in fact dipped from 13.9 to 13.7%. Core capital (tier I capital) expanded by EUR 0.7 billion and accounted for just under 60% of the capital increase. Supplementary capital (tier II capital) went up by EUR 0.4 billion and tier III capital increased by EUR 0.1 billion.

Austrian Banks' Capital Ratio

ATS billion — *Share in %*

Tier I capital (left axis)
Tier II capital (left axis)
Tier III capital (left axis)
Deductible (left axis)
Capital in percent of total assets (right axis)

Source: OeNB.

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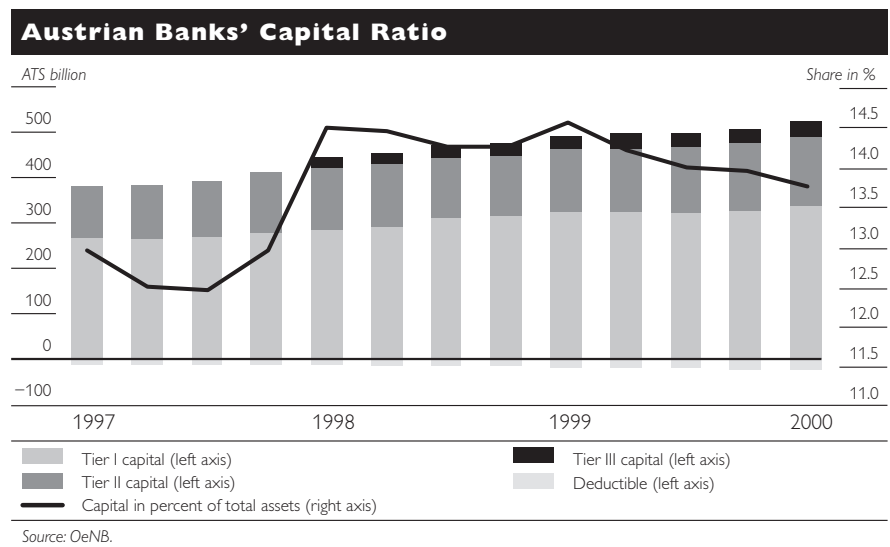
1   *Pursuant to Annex 1 to Article 22 Austrian Banking Act.*

2   *As defined under the "Own Funds" heading in Article 23 Austrian Banking Act.*

Balance of Payments in 1999[1])

The Austrian balance of payments reflects the considerable acceleration of the internationalization of the Austrian economy in 1999. The key factors behind this development were the boom in external trade, which started in the second half of the year, and the creation of euro financial markets.

1 Current Account

Austria's current account deficit calculated on the basis of transactions climbed from EUR 4,340 million in 1998 to EUR 5,420 million (or 2.8% of GDP) in 1999 (see table 1). In the EU, the current accounts of Germany, Spain, Greece, Portugal and the United Kingdom were also in deficit.

Current Account Balances of the EU Member States

% of GDP

Source: National sources.
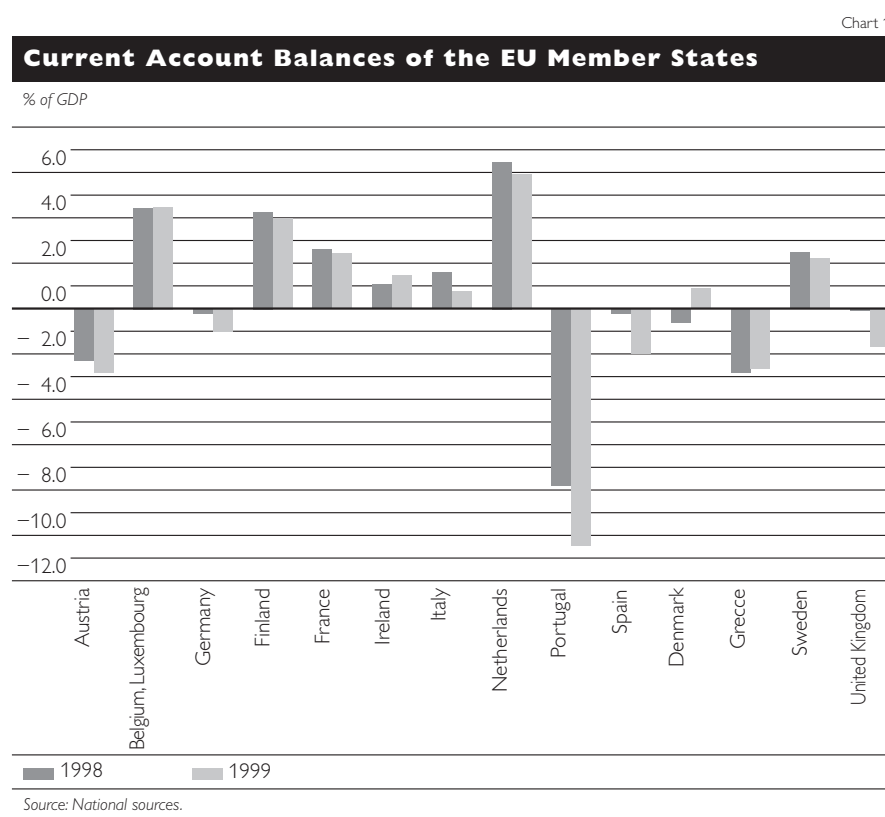
The rise in the current account deficit by EUR 1,080 million was primarily due to outflows in the income subaccount, which went up by EUR 1,100 million. On the other hand, the shortfall on goods and services narrowed slightly by EUR 140 million.

The *euro area as a whole* reported a current account surplus of EUR 22,800 million in the survey period. Against *countries outside the euro area[2]),* Austria posted a current account surplus of EUR 770 million and a current account deficit of EUR 6,190 million against *countries of the euro area.*

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1   *Based on transactions. Editorial close: May 3, 2000. As of the beginning of 1999, the Austrian balance of payments figures published in "Focus on Austria" are based on the currency unit euro, using the irrevocable conversion rate of EUR 1 = ATS 13.7603. In the German-language edition of OeNB's statistical monthly ("Statistisches Monatsheft"), by contrast, the data are given both in euros and in schillings.*

2   *Austria's current account vis-à-vis non-euro-area residents.*

1.1 Goods

The deficit on goods stagnated at –EUR 3,310 million in 1999, with Austrian external trade gaining considerable momentum in the second half of 1999 after relatively modest growth rates in the first six months (goods exports: +3.2%, goods imports: +3.5%). Over the whole year of 1999, goods exports and imports grew by 6% each.

The analysis of external trade[1] broken down by countries shows (see table 2) that Austria's external trade with *EU Member States* developed hesitantly between January and December 1999; the export and import growth rates amounted to only 3.6 and 3.7%, respectively. In absolute figures, goods worth EUR 37,290 million were exported from Austria to other EU countries and goods worth EUR 44,160 million were imported from the countries of the single market to Austria.

By contrast, merchandise trade with *countries outside the EU* was very lively in the survey period. Compared to 1998, exports were up 9.7% and imports increased by 9.4%. Austrian exports to non-EU member countries totaled EUR 22,280 million and imports from third countries to Austria came to EUR 20,380 million. The increase in exports is mainly traceable to the robust growth of goods sold to Switzerland (+29.5%) and the U.S.A. (+19.4%). Trade with Japan, Austria's most important market in Asia, also developed at an above average rate: Exports ran to EUR 730 million (a 39.4% increase compared to 1998), imports amounted to EUR 1,620 million (a 13.2% increase compared to 1998).

Exports to Eastern European countries climbed more rapidly than in 1998 (+2.7% to EUR 9,590 million), whereas import growth (+7.1% to EUR 7,570 million) slowed down.

Broken down by major commodity groups (see table 3), investment and consumer goods – proportionately the largest groups – registered above-average growth rates of both exports (some 8% each) and imports (some 10 and 8%, respectively). Food exports (with a 5% share in total exports) even rose by 14%. The 7% growth rate in energy imports was influenced by the oil price, which went up considerably in the course of the year.

1.2 Services

The favorable development of the balance on services continued in 1999, with the surplus going up by EUR 165 million to EUR 2,290 million. Once again travel was the engine of this upswing.

1.2.1 Travel

The recovery of the travel industry, which had started in the winter season 1997/98 after a five-year downturn, continued throughout the past calendar year. The number of overnight stays climbed by 0.5 million or 0.6% (see table 5), with the highest growth rates recorded in the first quarter. However, compared to the historic high of almost 100 million

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1   *According to Statistik Österreich.*

overnight stays in 1992, the number was still a fifth lower at 82.4 million in 1999.

The increase in overnight stays can primarily be attributed to a growing number of tourists from Germany (+300,000), the Netherlands (+200,000) and the United Kingdom (+100,000) as well as visitors from Central and Eastern Europe (+150,000). At the same time, the industry recorded fewer guests from France (–170,000) and from Russia (–50,000), which was gripped by economic turmoil.

Travel receipts (including international passenger transport) climbed by EUR 390 million or 3.4% and came to approximately EUR 11,750 million in the past calendar year (see table 4). Of the 2.7% increase in *revenues per overnight stay* to EUR 143, only 0.8 percentage point were attributable to higher prices. International passenger transport accounted for EUR 1,430 million (+EUR 130 million) of overall travel receipts, travel (excluding international passenger transport) rose by EUR 260 million to EUR 10,320 million. However, considering that tourism[1]) gained 3.2% (arrivals) or 3.1% (revenues in USD) worldwide, Austria once again lost market share in international tourism, with an increase in arrivals by 0.6% and a 2.3% decline in revenues (in USD).

Like in 1998, *travel expenditure* amounted to EUR 9,315 million (+0.3%) in 1999. International passenger transport accounted for EUR 740 million (+1.8%), travel excluding this item for EUR 8,570 million (+0.2%). One reason travel expenditures stagnated was that more Austrians opted to spend their vacations in Austria, as the price of vacations at home had become more attractive than holidays abroad.

The results of a survey commissioned by the OeNB among 12,000 households showed that the structure of Austrians' spending abroad had changed only marginally. At the top of the list in 1999 was the *Iberian peninsula,* where Austrians spent a total of approximately EUR 1,000 million, EUR 210 million more than in the previous year. Austrians thus followed a general trend. According to the World Tourism Organization, Spain recorded the highest growth rates in tourism of all European countries. In the balance of payments statistics of the German Bundesbank, Spain for the first time replaced Italy as the Germans' most popular holiday destination. Still, *Italy* remains Austrian tourists' uncontested favorite destination, with spending totaling EUR 1,800 million (+EUR 80 million) in 1999. There were also gains in *Germany* (thanks to a boom in business travels) and in Eastern Europe (with the exception of the Czech Republic), where, contrary to previous years, the amount of shopping trips only played a minor role. Austrian visitors' spending in other Mediterranean countries (in the eastern Adriatic region, Greece and, above all, Turkey), as well as western and northern Europe declined.

This development of travel receipts and expenses pushed the *surplus on the travel account* up considerably for the second time in a row to more than EUR 2,430 million. Travel excluding international passenger transport

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1   Source: Press release by the World Tourism Organization of January 25, 2000.

accounted for EUR 1,740 million, international passenger transport for EUR 690 million of this total.

1.2.2 Other Service Items

Other service items, like royalties and license fees (–EUR 460 million), transport (EUR 1,330 million) as well as other business-related services (EUR 1,340 million) also posted satisfactory results.

1.3 Income

In 1999, the deficit on the income subaccount amounted to EUR 2,540 million, EUR 1,100 million more than in 1998. Like in the previous years, *compensation of employees* remained in surplus at roughly EUR 500 million.

By contrast, the net outflow of cross-border *investment income* rose further, first and foremost because Austria's net debtor position increased sharply, reaching a value of EUR 3,100 million (see table 6). Gross investment income represents some 10% of the current account balance, which means that its share is approximately the same as that of the travel subbalance.

The Components of Investment Income:

According to the criteria defined in the 5th edition of the Balance of Payments Manual of the IMF, investment income incorporates income derived from direct investment, portfolio investment and other investment (which in essence comprises revenues from deposits, loans and reserve assets). Since the definition of reserve assets was changed in the review period of 1999, shifts in investment income have also occurred. The OeNB has met the obligation to calculate income on the basis of the accrual principle since the review period of 1997. Due to the present requirements concerning the harmonization of international statistics, the interest rate derivatives have been filtered out of the income on portfolio investment and reclassified under financial derivatives as of the review period of 2000 and retroactively back to the review period of 1992. Since some analyses require that investment income be considered with interest rate derivatives and others require the exclusion of interest rate derivatives, this aggregate is treated and analyzed separately.

Splitting investment income into the two different investment categories (income on venture capital-oriented investment[1]) and income on interest-bearing financial assets[2]) provides the following picture:

In 1999, the dynamic development of net investment income was triggered by interest-bearing financial instruments (their share of total investment income without interest rate derivatives was just above 60%). While income on venture-capital oriented investment in the form of equity capital and equity securities was in deficit by EUR 1,200 million, which was

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1   Comprising all income on investment in the form of equity capital and equity securities.

2   Comprising income on debt securities (fixed-interest bonds, deposits and loans, without regard to whether they are included in the categories direct investment, portfolio investment, other investment or foreign exchange reserves) and interest rate derivatives.

about the same as in the previous three years, the deficit on income derived from interest-bearing financial instruments mounted by some EUR 800 million each in the past two years and came to EUR 2,150 million in 1999. Interest rate derivatives posted a surplus of EUR 800 million and EUR 630 million in 1997 and 1998, respectively, which dropped to EUR 270 million in 1999.

Chart 2

Components of Austria's Investment Income[1]

EUR million

- Investment income on venture capital (direct investment and equity securities)
- Investment income on interest-bearing investment (debt securities, deposits and loans)
- Interest rate derivatives
- Total investment income

Source: OeNB.
[1] *1992 to 1997 final data, 1998 revised data, 1999 provisional data; as of 1997 in accordance with IMF's 5th BOP Manual.*

Table 1

Components of Austria's Investment Income[1]

	Investment income on venture capital[2]			Investment income on interest-bearing investment[3]			Interest rate derivatives	Total investment income
	Income		Balance	Income		Balance	Balance	Balance
	from abroad	abroad		from abroad	abroad			
	EUR million							
1992	− 184	790	− 974	5,218	5,763	− 545	−100	−1,619
1993	− 11	764	− 775	5,336	6,008	− 672	+136	−1,311
1994	278	1,294	−1,016	4,858	5,404	− 546	+ 43	−1,519
1995	130	1,715	−1,585	5,341	5,731	− 390	+309	−1,666
1996	668	1,628	− 960	6,049	5,960	+ 89	+156	− 715
1997	873	1,965	−1,092	6,741	7,202	− 461	+793	− 760
1998	984	2,322	−1,338	7,095	8,332	−1,237	+631	−1,944
1999	1,221	2,434	−1,213	7,387	9,538	−2,151	+266	−3,098

Source: OeNB.
[1] *1992 to 1997 final data, 1998 revised data, 1999 provisional data; as of 1997 in accordance with IMF's 5th BOP Manual.*
[2] *Investment income on direct investment and equity securities.*
[3] *Investment income on debt securities, deposits and loans.*

Income on direct investment was the most important component of income on venture-capital oriented investment. In 1999, Austrian enterprises' subsidiaries abroad for the first time posted profits of more than EUR 1,020 million (+18%), whereas Austrian companies with inward

direct investment augmented their profits by only 6% to EUR 2,180 million. Like in the previous two years, income on direct investment produced on balance outflows on the income subaccount, which came to more than EUR 1,000 million in 1999.

The revenues derived from investment income calculated on the basis of the average volume of interest-bearing investment[1]) amounted to a calculated interest rate of 4.3% on the assets side; on the liabilities side, the revenues were some 50 basis points higher.

Investment income derived from Austrian investment within the euro area amounted to EUR 3,270 million in 1999, slightly less than 40% of total investment income; interest-bearing securities accounted for EUR 2,910 million. Foreign investors within the euro area yielded investment income of EUR 5,270 million, which corresponds to a share of almost 50%. Income on interest-bearing securities totaled EUR 3,850 million. In a regional breakdown, Austrian outward investment outside the euro area focused on other EU countries and the U.S.A., whereas most investors not belonging to the euro area who invested in Austrian financial assets were located in Switzerland, the United Kingdom and the U.S.A.

1.4 Current Transfers

The current transfer deficit came to EUR 1,860 million in 1999, up from EUR 1,740 million in 1998. This figure comprises the lion's share of Austria's transactions with the EU. Austria's contribution to the EU budget amounted to EUR 2,250 million, and its receipts totaled EUR 1,310 million. The latter sum contains subsidies for infrastructure projects which are posted under the capital account. On balance, Austria contributed EUR 940 million to the EU budget in 1999, compared to EUR 820 million in the previous year.

2 Capital Account

The capital account closed with a deficit of EUR 130 million in 1999, after EUR 180 million in 1998. The *government's* capital transfers in kind comprise above all receipts from the EU which serve infrastructure measures and are therefore not to be considered as part of the current transfers. They amounted to EUR 200 million in 1999, compared to EUR 170 million in 1998. The *private sector's* capital transfers in kind closed with a deficit of EUR 350 million (EUR 280 million in 1998).

3 Financial Account

The introduction of the euro played a major role in the 1999 financial account. The new European currency is directly or indirectly responsible for both the dynamic development of cross-border financial transactions from Austria abroad and vice versa as well as the regional and currency-wise dispersion of net new investment.

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1   Contrary to the end-of-year figures in the international investment position, the stock was adjusted for price effects.

In terms of figures, this means that Austria's net new investment abroad totaled EUR 37,980 million, double the amount of transactions in 1998 (see table 7). Financial assets in the euro area accounted for approximately two thirds of this investment; of interest-bearing investment, a little less than 70% were euro-denominated debt securities.

Changes in Definition

The new classification of reserve assets considerably changed the structure of the financial account. From 1999 onwards, claims are defined as reserve assets if denominated in a currency other than euro and if they are held vis-à-vis nonresidents. Furthermore, reserve assets comprise monetary gold, special drawing rights and the IMF reserve position. Since transactions in euro or vis-à-vis residents are subsummed under "portfolio investment" and "other investment," the "monetary authorities" item accounts for a larger share within these categories than prior to 1999.

Table 2

Financial Account by Sectors

	1998[1])	1999[2])	4th quarter of 1999[2])
	net, EUR million		
Financial account total			
Assets	−16,900	−37,983	−1,890
Liabilities	+21,912	+44,653	+2,437
Balance	+ 5,012	+ 6,670	+ 457
Breakdown by sectors			
OeNB			
Assets	− 3,722	− 727	− 474
Liabilities	×	+ 5,670	−2,489
Balance	− 3,722	+ 4,943	−2,963
Government			
Assets	− 646	+ 15	+ 587
Liabilities	+11,291	+14,621	+2,240
Balance	+10,645	+14,636	+2,827
Banks			
Assets	− 3,035	−16,143	+2,740
Liabilities	+ 4,865	+18,461	+1,049
Balance	+ 1830	− 2,318	+3,789
Other sectors			
Assets	− 9,497	−21,128	−4,833
Liabilities	+ 5,756	+ 5,901	+1,637
Balance	− 3,741	−15,227	−3,196
Memorandum item:			
OeNB and banks			
Assets	− 6,757	−16,870	+2,266
Liabilities	+ 4,865	+24,131	−1,440
Balance	− 1,892	+ 7,261	+ 826
Unclassified transactions (errors and omissions)			
Balance	− 490	− 1,117	+1,071
Financial balance	+ 4,522	+ 5,553	+1,528

Source: OeNB.
[1]) Revised data.
[2]) Provisional data.

Chart 3

Austria's Financial Account with Countries in and outside
the Euro Area (Selected Net Subaccounts in 1999)¹)

EUR billion

Source: OeNB.
¹) Provisional data.
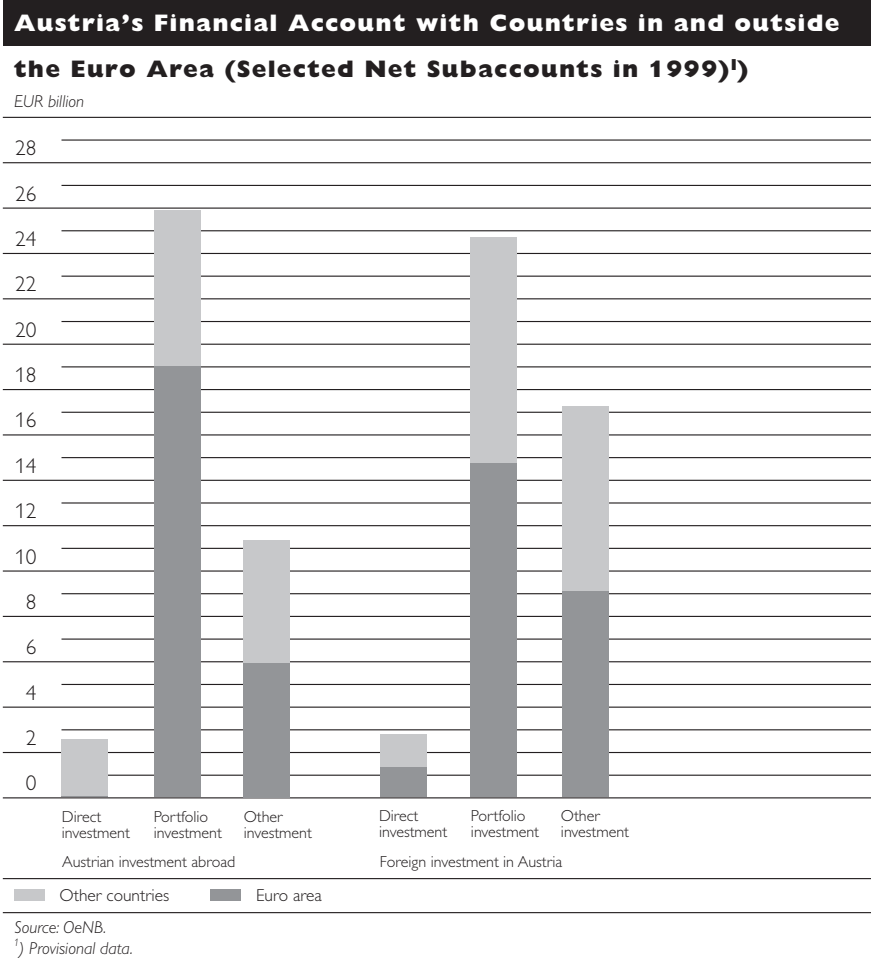
In the survey period, Austrian investors tended to opt for interest-bearing investment (accounting for 80% of total net new investment), though share purchases continued to rise.

Foreign investors purchased Austrian securities and equity capital to the tune of EUR 44,650 million, compared to EUR 21,900 million in the previous year. Austrian issuers did very well on the newly created euro market. Net new investment by residents of the joint monetary area accounted for some 50% of the total increase in external liabilities. Foreign investors showed a clear preference (90%) for interest-bearing securities, whereas net new investment in equity capital and shares was on the decline compared to 1998. Some 75% of all interest-bearing securities were euro-denominated.

A breakdown by *Austrian economic sectors* shows that the financial sector including the OeNB and the banks invested EUR 16,870 million in new external assets, with additional external liabilities amounting to EUR 24,130 million. On balance, the banks and the OeNB imported net capital with a transaction volume of EUR 7,260 million via the various channels. Domestic nonbanks raised their external assets by EUR 590 million on balance; the key factors behind this development were high

capital imports by the government (EUR 14,640 million), derived mainly from the sale of securities, on the one hand and increased outward investment (EUR 15,230 million) by mutual funds and insurance companies, which was chiefly made possible by the changed framework resulting from the introduction of the euro, on the other hand.

Broken down by *maturity,* Austrians invested more money in long-term financial assets or equity capital than foreigners invested in comparable Austrian assets; net capital exports of long-term financial assets came to EUR 7,000 million. This increase in assets contrasted with short-term net capital imports of EUR 13,670 million on balance, which were primarily attributable to the expansion of the banking system's external liabilities.

3.1 Direct Investment

Austrian direct investment abroad amounted to EUR 2,530 million in 1999 (1998: EUR 2,650 million). The high net investment in equity capital (including premises and buildings) of EUR 2,195 million reflects EUR 3,350 million of new investment and EUR 1,160 million of disinvestment by more than 1,000 Austrian companies and private persons. Thanks to the significantly higher income earned by Austrian subsidiaries abroad over the past few years, reinvested profits reached EUR 540 million in 1999. The repayment of loans taken out by Austrian investors to affiliated companies reduced outward direct investment stocks by EUR 200 million.

Some 40% of outward direct investment in the survey period, totaling slightly more than EUR 1,000 million, went to Eastern Europe. Like in 1998, the Czech Republic attracted the largest amount of Austrian investment (EUR 240 million) among the Central and Eastern European countries, followed by Poland (EUR 190 million), Slovenia (EUR 150 million) and Russia, where the large investment volume (EUR 150 million) was also used to cover losses or recapitalize to hedge long-term investment. Croatia (EUR 130 million) came in fifth in this ranking. The remaining EUR 150 million were invested in Hungary, which attracted only little Austrian investment in 1999, and the other countries of the region. Austrians invested only half as much in the EU (EUR 550 million) as in Eastern Europe, with Sweden having attracted the lion's share (EUR 325 million) thanks to a major investment project. Though Germany was the target of a large number of investment projects, substantial disinvestment in the media sector resulted in disinvestment of EUR 180 million on balance. With a total of EUR 810 million, investment outside Europe, especially in the U.S.A., Australia and the Caribbean off-shore financial centers, was extrardinarily high. All in all, Austria maintained direct investment relations with more than 100 countries worldwide. As regards the sectoral breakdown, asset-side direct investment covered a broad range of industries, from banking, building materials and foodstuffs (tobacco) to engineering and trade.

Inward direct investment in Austria came to EUR 2,770 million. The volume of net acquisitions by foreign companies of Austrian equity capital thus marginally exceeded Austrian outward direct investment. Compared with the year before, inward direct investment remained at a high level in

1999, albeit not quite as high as in 1998. Inward acquisitions of EUR 1,990 million contrasted with inward disinvestment of EUR 920 million. Equity holdings (including premises and buildings) thus amounted to EUR 1,070 million on balance. According to preliminary calculations, reinvested earnings totaled EUR 1,640 million, whereas the repatriation of other claims by foreign investors on their Austrian subsidiaries led to minimal disinvestment.

550 Austrian firms were involved in new investment, the expansion of existing investment or disinvestment in 1999.[1] The foreign partners came from more than 60 countries. As was mostly the case in previous years, Germany was the largest investor with a share of about 33% (EUR 930 million). The remaining EMU members (especially the Netherlands) accounted for another 14% of inward direct investment, EU members outside Monetary Union (United Kingdom) for 6%. Covering of losses was a major factor in inward investment made by Hungary, the sole significant investor from Central and Eastern Europe. Switzerland (EUR 270 million or 10%) owes its prominent position chiefly to its role as a prime location for holding companies. 27% of inward investment (EUR 760 million) came from outside Europe, above all from the U.S.A. and Japan. Broken down by sectors, the telecommunications industry remained the most popular target of investment. It accounts for three of the ten largest investment projects, including the largest project with 25% of the total direct investment volume of 1999. Significant investment was also recorded in trade, metal goods, electronics and technical services.

3.2 Portfolio Investment

The creation of the euro capital market was the driving force behind the sharp rise in investment in 1999. Already in 1998, in the runup to the introduction of the euro, cross-border *purchases and sales of securities* had increased compared to the years before, but in 1999, the amount of foreign securities acquired by Austrian investors more than doubled compared to 1998. Austrian investors' intention to restructure their portfolios after the introduction of the euro and at the same time invest in foreign securities without foreign exchange risks mainly fuelled this development. At the same time Austrian issuers had the opportunity to place their issues both in the euro area and with nonresidents; the federal government sold a large volume of issues abroad.

The results based on net transactions provide the following picture: Austrians' net new investment reached a transaction value of EUR 25,830 million (after EUR 10,150 million in 1998). Foreign investors raised their portfolio in Austrian securities through transactions by EUR 24,610 million, which resulted in net capital exports of EUR 1,230 million on balance (after net capital imports of EUR 5,870 million in 1998). The following figures illustrate the euro's impact on the capital markets and its relevance to Austria. 92% of Austrian net new investment in debt securities (some four fifths of all purchases) consisted of euro-denominated securities;

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1   *Excluding reinvestment.*

issues from (other) countries of the euro area accounted for 73% of Austria's net investment. 80% of securities sold by Austrian issuers abroad were euro-denominated; some 60% of investors in domestic securities came from the euro area.

The transactions were performed against the following background:[1])

— Rising European and U.S. bond yields for long-term debt securities as well as climbing equity prices in Europe, Japan and the U.S.A.

— Net sales on the markets for international debt securities as a reference value for issuing activity on securities markets increased by 60% compared to the previous year, even though activity subsided somewhat in the fourth quarter (most likely also due to problems in connection with the year 2000 date change).

— Financial institutions accounted for the highest share of issues, also because of the higher volumes of issues for the funding of takeovers. At the same time, bustling activity was registered in the area of corporate bonds, which once again carried higher spreads against benchmark bonds, while government borrowing remained stagnant both in Europe and the U.S.A.

— Turning to international placements, net sales of euro-denominated securities for the first time surpassed net sales of U.S. dollar-denominated securities. Both currencies gained market share at the expense of other currencies, especially of the Japanese yen, and together held a share of 90%. Both the euro and the U.S. dollar benefited from their "home markets" in Europe and North America, respectively.

3.2.1 Austrian Investors' Portfolio Investment

Austrian investors purchased foreign securities with a transaction value of EUR 25,830 million. Debt securities accounted for 80% of total net new investment in foreign securities and equity securities for the remainder, which was despite increasing market capitalization. The sharp increase in Austrian investment in foreign securities as well as the regional distribution thus corresponded to the development in the euro area, except for the fact that other countries of the euro area diversified their portfolios more by opting for larger stakes in equity securities.

The transaction-induced increase of *foreign equity securities* totaled EUR 5,085 million in 1999, with foreign shares and other equity securities accounting for EUR 2,925 million and *foreign mutual funds shares* accounting for EUR 2,160 million. Austrians preferred quoted *shares* of the financial, industrial and technological sectors; 40% of this investment was made in the first quarter of the year. Domestic investors were especially keen on shares from the U.S.A. and the euro area. In the mutual funds shares category, investors showed a predilection for balanced funds and equity funds (40% were purchased in the fourth quarter).

While the purchase of *foreign money market instruments* did not play a major role although there was some stimulation of issuing activity (net

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1　See also the BIS Quarterly Review: "International Banking and Financial Market Developments," February 2000.

purchases totaled EUR 100 million), *foreign bonds and notes* were very popular with Austrian investors (EUR 20,650 million). A breakdown by investors shows that banks accounted for 40% of investment in this category. Institutional investors (insurance companies, mutual fund firms and pension funds) were responsible for the remaining 60%. Portfolio enlargement focused very much on the euro area (73% of debt securities). Debt securities launched by German issuers played a significant role in investment in the euro area (some 45% of net new investment), with Austrian investors purchasing not only government bonds but also increasingly attracted by the growing selection of mortgage bonds. Furthermore, especially securities from France and the Netherlands were much sought after. Broken down by nominal currencies, Austrian investors opted for euro-denominated securities (92% of all net new investment), despite higher U.S. yields and the climbing exchange rate of the U.S. dollar.

3.2.2 Portfolio Investment in Austria

In 1999, foreign investors purchased Austrian securities with a market value of some EUR 24,610 million. This marks a 50% increase in net sales of Austrian securities compared to 1998. The foreign investors' interest in both debt securities and equity securities was higher than in 1998. The

Chart 4

Cross-Border Security Transactions –

Net Investment by Financial Instruments[1])

EUR billion

Austrian investment abroad — Foreign investment in Austria

Equity securities   Debt securities
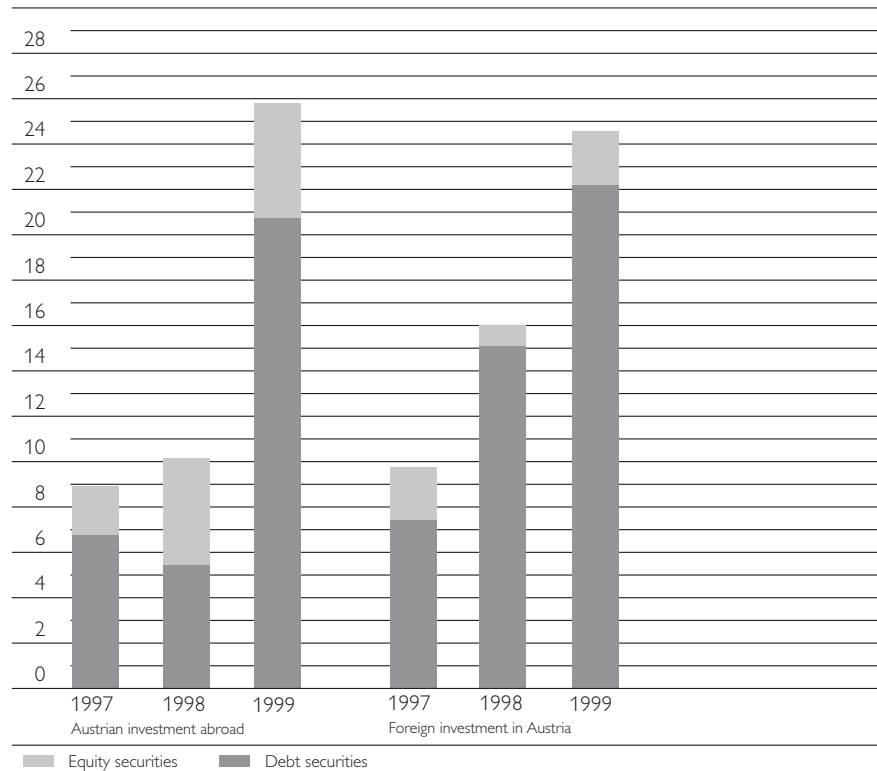
Source: OeNB.
[1]) *1997 final data, 1998 revised data, 1999 provisional data.*

significant proportion of net sales of central government issues (60% of the total sales) highlights the attractiveness of this type of securities abroad under the new conditions created by the common currency.

Foreign investors acquired *Austrian equity securities* worth EUR 2,370 million in 1999. Unlike in 1998, when foreign investors had sold Austrian shares on balance, they purchased *Austrian shares* for some EUR 890 million in 1999. Foreigners snapped up shares especially of listed banks, industrials and utilities; 55% of the purchases were completed in the second quarter (in April, the ATX reached the highest end-of-month quotation of 1999). Approximately EUR 1,480 million were invested in *Austrian mutual fund shares,* especially in fixed-income funds and balanced funds.

Austrian *bonds and notes* with a market value of EUR 18,700 million and domestic *money market instruments* worth EUR 3,540 million were sold abroad in 1999, which together marked a 40% increase on 1998. Money market instruments, which were relatively sought after measured in terms of total sales of Austrian debt securities abroad, apparently benefited from the insecurity about future interest rate developments, which emerged in the second half of the year.

More than half of the purchases were apparently made by investors in the euro area, while the rest was sold above all via British banks.[1] A breakdown by sectors shows that like in 1998, the government was the main issuer in 1999. Nonresidents purchased debt securities floated by the government with a market value of EUR 13,570 million. Foreign investors showed a clear preference for federal government bonds (EUR 12,720 million) floated by means of tender procedure or as syndicated loans which, thanks to gradual reopenings and poolings, have become highly liquid bonds.[2]

Table 3

Tender and Syndicated Loans

in 1999[1]

		ISIN	Net sales
			EUR million
3.9%	Federal government bond 1998−2005/3	AT0000384524	1,750
4.125%	Federal government bond 1999−2014/1	AT0000384748	568
6.25%	Federal government bond 1997−2027/6	AT0000383864	1,541
4%	Federal government bond 1999−2009/2	AT0000384821	1,618
3.4%	Federal government bond 1999−2004/3	AT0000384862	2,439
4.3%	Federal government bond 1999−2003/2	AT0000384359	987
5.5%	Federal government bond 1999−2010/4	AT0000384938	1,858
Total			10,761

Source: OeNB.
[1] *Transaction values: + = sale abroad.*

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1 On the liabilities side, debt security sales and purchases are regionally classified according to the issuer/payment agent rather than the issuer/holder of the security, i. e. creditor. The payment agent is usually the foreign bank which is also the lead manager or the appointed paying agent. In the case of tender allocations of federal government bonds, payment is made by the individual tender banks. Since most domestic securities are sold on the primary market and, in the case of issues in U.S. dollars, are secured by swaps, it can be assumed that the regional allocation roughly corresponds to the creditor countries.

2 With an outstanding volume of at least EUR 5,000 million as a reference value for liquid euro bonds.

Apart from long-term securities, many foreign investors also decided in favor of Austrian Treasury bills, which are also issued by the federal government. 90% of the government bonds sought after by foreign investors were euro-denominated. In addition, the public sector also sold Swiss franc and Japanese yen issues abroad.

The bonds and money market instruments issued by banks posted sales abroad worth EUR 5,350 million. In addition to the usual high share of U.S. dollar-denominated securities, banks also sold issues in Swiss francs to refinance domestic loans in this currency. Sales of corporate bonds abroad saw a contrasting development; on balance, foreign investors sold Austrian corporate bonds worth EUR 210 million. Contrary to other countries of the euro area, the number of corporate bonds on offer did not increase.

3.3 Other Investment

Like security transactions, *deposits and loans* also witnessed a dynamic development in 1999, which was considerably influenced by financing and refinancing activities by the banking system (the OeNB and banks). Debt financing, especially in connection with Eastern European countries, (mostly by means of export financing) and syndicated loans granted by Austrian banks in connection with takeovers played a decisive role, as did the short-term refinancing of current account transactions and transactions for the banks' own account as well as transactions of the nonbank sector. The "payment channels" used in 1999 were not only the banks but also the settlements carried out by the OeNB.

The transactions in the balance of payments in 1999 show that the banking system accounted for EUR 8,650 million of net new investment abroad amounting to EUR 11,320 million, mostly long-term investment, which is included in the loans item. About one third of the loans granted by Austrian banks were extended to Central and Eastern European countries. 50% of transactions performed by the banking system in the form of deposits and loans were carried out with other EMU Member States. Almost the entire volume of net inflows from foreign banks and enterprises went to the Austrian banking system; more than 95% of the inflows consisted of short-term loans and deposits. Investors from the euro area represented a market share of some 50% of nonresident creditors.

The banking system recorded net capital imports of EUR 7,620 million on balance, whereas nonbanks exported net capital of EUR 1,750 million (almost as much as in 1998).

3.4 Reserve Assets

Under the new, standardized definition for the euro area, Austria's *reserve assets* on a transaction basis declined by EUR 1,960 million in 1999. The decrease was primarily due to transfers of reserve assets of EUR 1,180 million to the ECB, as stipulated in the relevant treaties and agreements, at the beginning of 1999.

4 Annex

Table 1

Balance of Payments Summary

	1998[1])	1999[2])	Annual change
	EUR million		
Current account	−4,342	−5,418	−1,076
Goods, services and income	−2,604	−3,560	− 956
Goods and services	−1,167	−1,024	+ 143
Goods	−3,289	−3,311	− 22
Services	+2,122	+2,287	+ 165
thereof:			
Travel	+1,502	+1,744	+ 242
Construction services	+ 245	+ 256	+ 11
Financial services	+ 42	+ 96	+ 54
Royalities and license fees	− 639	− 462	+ 177
Other business services	+1,235	+1,338	+ 103
Government services, n,i,e,	+ 362	+ 299	− 63
Unclassified transactions	−1,545	−2,070	− 525
Income	−1,437	−2,536	−1,099
Compensation of employees	+ 505	+ 561	+ 56
Investment income	−1,942	−3,098	−1,156
Current transfers	−1,738	−1,858	− 120
General government	−1,349	−1,411	− 62
Private sector	− 389	− 447	− 58
Capital and financial account	+4,832	+6,535	+1,703
Capital account	− 180	− 134	+ 46
General government	+ 109	+ 186	+ 77
Private sector	− 277	− 349	− 72
Acquisition/disposal of nonproduced, nonfinancial assets	− 11	+ 28	+ 39
Financial account	+5,011	+6,669	+1,658
Direct investment	+1,758	+ 233	−1,525
Portfolio investment	+5,865	−1,227	−7,092
Other investment	+ 741	+5,869	+5,128
Financial derivatives	− 439	− 169	+ 270
Reserve assets[3])	−2,914	+1,963	+4,877
Errors and omissions	− 490	−1,117	− 627

Source: OeNB.
[1]) Revised data.
[2]) Provisional data.
[3]) OeNB: Gold and foreign exchange, reserve position in the Fund, SDRs, etc.: increase: − / decrease: +.

Table 2

Merchandise Exports and Imports as Recorded

in the Foreign Trade Statistics

Goods by geographic area

	1999					
	Exports		Imports		Balance	
	Annual change	Share of total exports	Annual change	Share of total imports		Annual change
	%				*EUR million*	
OECD	+ 6.5	77.4	+ 5.0	81.3	−6,397	+337
EU	+ 3.6	62.6	+ 3.7	68.4	−6,870	−297
EMU	+ 3.2	55.9	+ 3.8	63.2	−7,528	−492
thereof:						
Germany	*+ 2.5*	*34.8*	*+ 5.3*	*41.7*	*−6,164*	*− 34*
Italy	*+ 3.4*	*8.4*	*+ 0.3*	*7.6*	*+ 82*	*+150*
France	*+ 5.7*	*4.5*	*+ 6.9*	*5.0*	*− 540*	*− 64*
CEECs[1])	+ 2.7	16.1	+ 7.1	11.7	+2,022	−250
U.S.A.	+19.4	4.6	+18.1	5.4	− 767	− 93
Japan	+39.4	1.2	+13.2	2.5	− 895	+ 16
Total	+ 5.8	100.0	+ 5.5	100.0	−4,971	− 73

Source: Statistics Austria.
[1]) *Central and Eastern European countries: Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovenia, Ukraine, Yugoslavia.*

Table 3

Merchandise Exports and Imports as Recorded

in the Foreign Trade Statistics

Goods by commodity category

	Exports			Imports			Balance	
	1999	Annual change		1999	Annual change		1999	Annual change
	EUR million		%	*EUR million*		%	*EUR million*	
Foodstuffs	2,819	+ 349	+14.1	3,563	+ 30	+0.9	− 744	+319
Raw materials	2,670	+ 240	+ 9.9	5,112	+ 242	+5.0	−2,442	− 2
thereof: energy (SITC 3)	*570*	*+ 9*	*+ 1.6*	*2,737*	*+ 172*	*+6.7*	*−2,166*	*−163*
Semimanufactured goods	8,177	− 790	− 8.8	7,797	− 524	−6.3	+ 380	−267
Manufactured goods	45,812	+3,437	+ 8.1	48,018	+3,657	+8.2	−2,206	−220
Capital goods	15,992	+1,189	+ 8.0	16,283	+1,439	+9.7	− 291	−251
Consumer goods	29,820	+2,248	+ 8.2	31,735	+2,217	+7.5	−1,915	+ 31
Miscellanous manufactured articles	92	×	×	50	×	×	+ 42	×
Total	59,570	+3,268	+ 5.8	64,541	+3,341	+5.5	−4,971	− 73

Source: Statistics Austria.

Table 4

Travel and International Passenger Transport

	1998[1])	1999[2])	Annual change	
	EUR million			*%*
Travel				
Receipts	10,058	10,316	+ 258	+ 2.6
Expenses	8,556	8,572	+ 16	+ 0.2
Balance	1,502	1,744	+ 242	+16.1
International passenger transport				
Receipts	1,299	1,432	+ 134	+10.3
Expenses	730	743	+ 13	+ 1.8
Balance	568	689	+ 121	+21.2
	1,000			*%*
Foreign tourist bednights	*81,867*	*82,396*	*+ 529*	*+ 0.6*

Source: Statistics Austria, OeNB.
[1]) Revised data.
[2]) Provisional data.

Table 5

Foreign Tourist Bednights by Country of Origin

	1999			
	Overnight stays	Annual change		Share
	1,000		*%*	
Germany	53,074	+ 283	+ 0.5	64.4
Netherlands	7,010	+ 223	+ 3.3	8.5
United Kingdom	2,782	+ 108	+ 4.0	3.4
Belgium, Luxembourg	2,270	+ 15	+ 0.7	2.8
Switzerland, Liechtenstein	2,782	− 21	− 0.8	3.4
Sweden	636	+ 12	+ 1.8	0.8
France	1,723	− 167	− 8.8	2.1
Italy	2,676	+ 70	+ 2.7	3.2
Spain	463	− 23	− 4.8	0.6
Finland	179	+ 14	+ 8.3	0.2
U.S.A.	1,566	− 30	− 1.9	1.9
Japan	575	+ 12	+ 2.1	0.7
Hungary	692	+ 43	+ 6.7	0.8
Slovakia	139	+ 6	+ 4.7	0.2
Czech Republic	691	+ 45	+ 7.0	0.8
Poland	795	+ 99	+14.1	1.0
Commonwealth of Independent States	333	− 55	−14.1	0.4
Slovenia	203	− 2	− 0.8	0.2
Croatia	233	+ 4	+ 1.8	0.3
Other Countries	3,574	− 106	− 2.9	4.3
Total	82,396	+ 529	+ 0.6	100.0
Memorandum item: Austrian tourists	*30,301*	*+1,012*	*+ 3.5*	*x*

Source: Statistics Austria.

Table 6

Investment Income

	1998[1])	1999[2])	Annual change
	EUR million		
Investment income receipts	8,709	8,875	+ 166
Investment income payments	10,650	11,972	+1,322
Net investment income[3])	− 1,942	− 3,098	−1,156
Net direct investment incom[3])	− 1,202	− 1,164	+ 38
Income on direct investment abroad	863	1,018	+ 155
Income on direct investment in Austria	2,065	2,182	+ 117
Net portfolio investment income[3])	− 1,740	− 2,328	− 588
Income on foreign equity securities	165	282	+ 117
Income on domestic equity securities	259	255	− 4
Income on foreign debt securities	2,091	2,877	+ 786
Income on domestic debt securities	4,249	5,376	+1,127
Income on foreign money market instruments	18	45	+ 28
Income on domestic money market instruments	137	168	+ 30
Financial derivatives on interest rate contracts, net	+ 631	+ 267	− 364
Net other investment income[3])	+ 1,000	+ 395	− 605
Income on other investment, assets[4])	4,940	4,385	− 555
Income on other investment, liabilities	3,940	3,991	+ 51

Source: OeNB.
[1]) *Revised data.*
[2]) *Provisional data.*
[3]) *Income on outward foreign investment less income on inward foreign investment.*
[4]) *Income on deposits, credits and reserve assets.*

Table 7

Financial Account

(including change in reserve assets)

	1998[1])	1999[2])	4th quarter 1999[2])
	EUR million, net		
Financial account	+ 5,011	+ 6,669	+ 457
Assets	−16,901	−37,983	−1,981
Liabilities	+21,913	+44,652	+2,437
Direct investment	+ 1,758	+ 233	− 111
Direct investment abroad	− 2,652	− 2,534	− 300
Equity capital	− 2,098	− 2,195	− 219
Reinvested earnings	− 530	− 537	− 65
Other capital	− 24	+ 198	− 16
Direct investment in Austria	+ 4,411	+ 2,767	+ 190
Equity capital	+ 3,192	+ 1,069	− 148
Reinvested earnings	+ 1,211	+ 1,642	+ 339
Other capital	+ 7	+ 56	− 2
Portfolio investment	+ 5,865	− 1,226	− 758
Portfolio investment in foreign securities	−10,153	−25,833	−5,933
Equity securities	− 4,709	− 5,085	−1,784
Bonds and notes	− 5,775	−20,647	−4,373
Money market instruments	+ 331	− 101	+ 225
Portfolio investment in domestic securities	+16,018	+24,607	+5,175
Equity securities	+ 908	+ 2,367	+ 664
Bonds and notes	+14,807	+18,704	+3,568
Money market instruments	+ 304	+ 3,536	+ 943
Other investment	+ 741	+ 5,869	+1,592
Assets	− 825	−11,317	+4,580
Trade credits	+ 641	− 263	− 38
Loans	− 3,840	−11,576	−2,515
Currency and deposits	+ 2,405	+ 1,770	+7,094
Other assets	− 30	− 1,249	+ 40
Liabilities	+ 1,566	+17,186	−2,988
Trade credits	− 266	+ 97	+ 87
Loans	+ 59	+ 1,862	+1,301
Currency and deposits	+ 1,465	+14,855	-4,613
Other liabilities	+ 308	+ 372	+ 236
Financial derivatives	− 439	− 169	− 364
Assets	− 356	− 262	− 425
Liabilities	− 83	+ 93	+ 61
Reserve assets[3])	− 2,914	+ 1,963	+ 97

Source: OeNB.
[1]) *Revised data.*
[2]) *Provisional data.*
[3]) *OeNB: Gold and foreign exchange, reserve position in the Fund, SDRs, etc.: increase: − / decrease: +.*

The Monetary Policy

of the Eurosystem

Monetary Policy and Monetary Strategy in EMU:
New Framework – New Challenges

Peter Mooslechner

I Introduction

More than two years ago, the EU took the decision which EU Member States were to join the euro area and the European System of Central Banks (ESCB) was established; one and a half years ago, Monetary Union entered Stage Three; today, one of the central questions about monetary policy is – not surprisingly – how the new system of a single European monetary policy and the institutions created for this system operate in practice. However, answering this question is not an easy task, given that the abundance of media reports and the ongoing public discussion about the euro's exchange rate obscure an analysis from a strictly monetary policy point of view.

An analysis of the Eurosystem's[1] monetary policy performance in the past two years produces some noteworthy results[2]:

– The nomination of the participants in Stage Three of Monetary Union, the announcement of the irrevocable bilateral exchange rates between the participating currencies and the establishment of the ESCB and the European Central Bank (ECB) stabilized expectations of the Eurosystem's monetary policy already in 1998 and ensured that, contrary to some gloomy predictions, the euro got off to a smooth start (Obstfeld, 1997; Wyplosz, 1997; Feldstein, 1997; Corsetti and Pesenti, 1999).

– In an environment of unstable financial markets (DeLong, 1999b; Hoenig, 1998; Marshall, 1998), Monetary Union demonstrated its stabilizing role even before having entered into Stage Three by preventing exchange rate crises from spilling over to the EU. Moreover, the coordinated interest rate decision in December 1998 harmonized interest rate policies already in the runup to the changeover.

– The changeover to Stage Three of Monetary Union went smoothly also at all operational and technical levels, from payment systems to the use of a new mix of monetary instruments (ECB, 1999b), even though prior to the transition, several countries had been forced to push through far reaching reforms of financial market structures which had evolved over time.

– By curbing interest rates sharply in April 1999 and shifting to a "tightening bias" in monetary policy in the fall of 1999, the Eurosystem showed that it was willing to respond swiftly and flexibly to new challenges for monetary policy. The historically low inflation rate this year may be attributable first and foremost to special factors, but the de-facto price stability projected for the next few years is evidence of the success of the single monetary policy.

All in all, the transition to Stage Three of Monetary Union involved far fewer uncertainties and difficulties for monetary policy than originally expected. However, this assessment does not imply that all the problems

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1 The concept "Eurosystem" comprises the European Central Bank (ECB) and the national central banks of the Member States which have adopted the euro in Stage Three of EMU (currently eleven). The broader concept ESCB also includes the central banks of the – currently four – Member States which have so far not joined EMU.

2 For further details see also Favero et al. (2000) and OECD (2000).

have been resolved, the changeover to full Monetary Union has been entirely completed and that the Eurosystem can return to a type of monetary policy pursued before EMU.

Leaving aside the slide in the euro's exchange rate, the creation of Monetary Union with its common monetary policy infrastructure represents a radical departure from previous policies in Europe. Hence, returning to pre-EMU monetary policies is out of the question. At the same time, the Eurosystem still has a long way to go before European monetary policy becomes as established and autonomous as U.S. or German monetary policy had been for decades.

There is one aspect which seems particularly appropriate to highlight and explain these challenges for the Eurosystem's monetary policy: the implementation of the Eurosystem's monetary policy, i.e. the monetary policy strategy, in the changed institutional and economic environment of Monetary Union. It is therefore vital to continue to discuss this monetary policy strategy and critically review it against the background of the conditions under which it is formulated and its results.

Notwithstanding the importance that has to be attached to the formulation of the Eurosystem's monetary policy, it would be wrong to disregard the background against which monetary policy is implemented. However, it often appears as if this general aspect of monetary policy had been neglected recently, as all attention has focused on the "novelty" of a single monetary policy. Still, it must be noted that these general conditions and problems rather than the changeover to Stage Three of Monetary Union will be the central challenges for monetary policy in the next decade.

2 The Eurosystem's Monetary Policy in Theory and Practice

With the changeover to Stage Three of EMU on January 1, 1999, Europe took the historically unique step of fundamentally reorganizing the institutional and economic framework of monetary policy. Naturally, this unprecedented process also entails a higher degree of uncertainty, which has to be overcome above all by pragmatically implementing monetary policy.

Thus, the monetary policy strategy of the Eurosystem had to incorporate both the historical experience of the participating countries and the new conditions created by Monetary Union. At the same time, the plans to establish Monetary Union had sparked off an academic debate about monetary policy strategies, which also influenced the choice of strategy.[1] Considering the uncertainties involved in the changeover to a single monetary policy for eleven participating countries, such as changes in the quality of indicators and the monetary transmission mechanism and various kinds of structural breaks, it would have been surprising if a decision in favor of a simple monetary policy strategy (for instance, adopting a direct

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[1] For the latest information on various aspects of the debate see Bernanke and Mishkin (1997), Brandner and Schuberth (1999), Carnegie-Rochester Conference Series on Public Policy (2000), Cecchetti (1998), Clarida et al. (1999), Federal Reserve Bank of Kansas City (1999), King (1997), McCallum (1999), Monetary Policy Rules (1999), Money and Monetary Policy in a Changing World (2000).

monetary rule) or the continuation of the NCB's old monetary policies had been a viable option.

Article 105 of the Maastricht Treaty states that "the primary objective of the ESCB shall be to maintain price stability;" however, it does not give a clear definition of this target and does not stipulate which strategy shall be chosen or which instruments are considered to be appropriate to achieve this goal.

The Governing Council of the ECB thus devised a new monetary policy strategy which blends elements of the monetary policies formerly pursued by the individual central banks (continuity) with the new demands and uncertainties of the transition to Monetary Union (flexibility) as well as the provisions of the Statute of the ESCB and of the ECB.[1] It is a flexible strategy that does not adopt part and parcel one of the theoretical concepts which used to be (or still is) followed by one national central bank.[2] Apart from accomplishing the desired continuity in its stability-oriented policy, the ECB – being a young institution – was compelled to quickly build up a credibility track record of its own.

The Eurosystem's monetary policy strategy is based on two elements: the formulation of the price stability target and a wide range of economic and financial indicators for the assessment of the risks for price stability.

– The ESCB defines price stability not as a variable inflation target but as a "year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area of below 2%." Price stability, according to this definition, "is to be maintained over the medium term."

– The range of indicators for the assessment of the risks of price stability is based on a two-pillar model.

1) To signal the prominent role that has been assigned to money, the ECB Governing Council has set a reference value for M3 which is consistent with price stability in the medium term[3] as the first pillar of the overall stability-oriented strategy. Thus, the monetary policy strategy incorporates modified elements of the monetary targeting policy of the Deutsche Bundesbank.

2) The second pillar of the monetary policy strategy is a broadly-based assessment of the outlook for price developments. Forecasts of crucial economic indicators, including inflation developments, play a significant role in this assessment.

It is vital that these two pillars not be misinterpreted as targets or any form of monetary rule. On the contrary, the ECB's Governing Council has made it clear that it will take its decisions on the basis of a comprehensive assessment of a broad range of economic indicators, whereas isolated developments of individual indicators, such as the deviation of monetary

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1   For a comprehensive discourse on the monetary policy strategy see ECB (1999a).

2   Since the prevalent monetary policy strategy, the peg (to the Deutsche mark), was automatically rendered obsolete by the creation of Monetary Union, money targeting (Deutsche Bundesbank) and direct inflation targeting (Bank of England) remained as strategies which could be chosen as guidelines for a new monetary policy.

3   The calculation of this reference value is based on the definition of price stability, assumptions for the trend growth of potential output and for the trend development of the velocity of circulation of M3.

growth from the reference value, will not prompt automatic and "mechanistic" monetary policy responses (ECB, 1999a).

The structure of the monetary policy strategy clarifies the much discussed role of the exchange rate: Along with other indicators, the exchange rate of the euro is a component of the second pillar. Therefore, it cannot be viewed as a target of the Eurosystem's monetary policy, but it is given some consideration in actual monetary policy decisions. Nonetheless, more weight will be attached to the exchange rate whenever its development poses a threat to price stability in the Eurosystem. In any other case, it will have a largely insignificant impact on monetary policy decisions. This is also true of all the other indicators of the second pillar, such as wage developments.

One and a half years after the transition to Stage Three of Monetary Union, only little can be said about the success of the Eurosystem's monetary policy strategy. It is too short a period to give an in-depth qualitative, let alone empirical, assessment. However, some trends and patterns can already be made out, so that at least the experience made so far can be assessed and analyzed.

On the whole, the monetary policy strategy of the Eurosystem has done well in the first 18 months of Stage Three of Monetary Union. The results accomplished in this period are definitely consistent with the defined targets. Such an assessment may not sound very enthusiastic, but it is quite satisfactory, considering that implementing a single monetary policy for eleven very different European countries in an entirely new institutional environment has been a truly historic feat. The first year of Monetary Union was characterized by an extraordinarily high degree of price stability (though it must be admitted that a series of special effects contributed to this success). Although several factors like high oil prices, the strong dollar and rising demand currently weigh heavily on monetary policy, international forecasts anticipate inflation rates of slightly below the 2% value which the ECB Governing Council defines as price stability for 2000 and the next few years.

The current economic development and the latest forecasts confirm that the chosen monetary policy strategy has not hampered the upswing in Europe that started in the summer of 1999. Even the European labor market has already shown signs of a long-awaited recovery. This assessment may not sound spectacular either, but compared to monetary policy in Europe prior to EMU, the Eurosystem's monetary policy strategy has performed admirably.

As a case in point, without Monetary Union, Europe may well have been hit much harder by the international financial crisis of 1998. Following the "safe haven" pattern of capital transactions, without EMU the Deutsche mark and the currencies closely linked to it would have appreciated, which would have generated tensions in the European Monetary System (EMS). We have repeatedly seen that situations like that can lead to interest hikes and realignments of the currencies affected. Such developments would ultimately have a severe impact on the real economies of all EU Member States (DeLong, 1999b). Similarly, harmonizing interest rates before Stage

Three of EMU and averting nationally oriented interest hikes in economies at a more advanced stage of the business cycle also helped prevent the economic tensions between countries that had often occurred prior to Monetary Union.

Finally, it is of crucial importance that the monetary policy strategy of the Eurosystem has been implemented with a high degree of flexibility since the beginning of 1999. In the first few months of EMU, economists worried about threats of deflation (Perry, 1998; DeLong, 1999a) and negative real effects following the international financial crisis; later, the strong U.S. dollar and the increases in oil and commodity prices generated inflation risks. All these effects were reflected in the indicator model of the Eurosystem's monetary policy strategy and thus also fed into the corresponding political decisions.

One of the most complex questions in this context is the assessment of the usefulness of M3 as an indicator (i.e. the first pillar). Monetary growth clearly reflected the uncertainties about data and about reactions to the changeover to Stage Three of Monetary Union. Since the beginning of 1999, M3 has expanded at a much higher rate than the reference value of 4.5%. The derivation of this reference value can only evaluate long-term relations between inflation, economic growth and velocity of circulation based on historical data to produce forecasts about which future development of M3 is consistent with price stability. If, however, these relations are no longer as stable as before EMU, their significance as indicators for monetary policy will be limited.

It may be too early to make reliable predictions, but there are already signs that the usefulness of M3 as an indicator could be limited. In any case, the defined monetary policy strategy proved appropriate to deal even with this problem: The implementation of the strategy, at least temporarily, shifted more toward inflation targeting, a move that highlights the fundamental flexibility of the ECB's monetary policy.

Regardless of all positive aspects, it must also be stressed that any monetary policy strategy is faced with a vast range of unpredictable factors and problems, ranging from ordinary data problems to flawed forecasts and long-term structural changes whose impact on monetary policy is hard to assess. As has been mentioned before, the media have been giving the problems linked with the Eurosystem's monetary policy extensive coverage; this may be comprehensible in the light of the "novelty" of a single monetary policy and the political implications of EMU for the whole integration process; but, on the other hand, such attention appeared exaggerated under the currently favorable economic conditions and in comparison to the attention focused on other countries' monetary policies.

There are still a number of questions which the Eurosystem's monetary policy strategy has not addressed satisfactorily so far, such as the specific role of the exchange rate under conditions of virtual price stability. Obviously, there is no easy answer to this question, but why should the Eurosystem's exchange rate policy attract so much interest compared to the exchange rate policies pursued, for instance, by the Bank of England or the

Bank of Japan, which both have to contend with highly overvalued currencies?

3 Monetary Policy Challenges at the Beginning of a New Millennium

Issues that are given broad media coverage these days are often far less important to monetary policy than a number of challenges triggered by structural changes in the national economies. Three topics that have already become highly relevant to the formulation of monetary policy[1]) are discussed below:

The economic debate of the 1990s added weight to monetary policy and its theoretical basis, which went hand in hand with a shift in monetary policy toward a range of new issues brought about by the receding threat of high inflation in all industrial countries. As inflation had been considered one of the most crucial economic problems in the 1970s and early 1980s, economists had long turned a blind eye to more subtle and complex questions for monetary policy. Consequently, monetary policy today focuses on entirely different issues than 20 years ago (Clarida et al., 1999), for instance on the institutional framework of monetary policy (Hahn and Mooslechner, 1999) as well as on the impact monetary policy has on the real economy and the transmission mechanism of monetary policy (Mishkin, 1995).

All these aspects will in more ways than one shape the monetary policies of the Eurosystem and of the U.S.A. and of every other industrialized country at the beginning of the new millennium. Already today, a series of questions and case studies highlights the challenges lying ahead, but economists are not yet able to provide the necessary answers.

3.1 Deflation and the "Liquidity Trap:" The Case of Japan

In the first half of 1999, the danger of extensive deflation[2]) sparked fierce discussion, but political reactions to such fears and the fact that the coincidence of extraordinary price-dampening factors was overrated prevented this risk from materializing. Still, the focus of attention has shifted to Japan, which has witnessed an unusual period of stagnation for almost a decade.

Japan has often been described as the tragic paragon of (price) deflation, which, however, has not produced cumulative effects yet. Neither the zero-interest-rate policy of the Japanese central bank nor far reaching fiscal and economic measures have succeeded in setting off sustained economic growth. It is almost an irony of fate that until recently, the Japanese economy had been a veritable success story since the end of the Second World War.

From an economist's point of view, however, the case of Japan is less an example of deflation than an example of the "return of the liquidity trap" and the typical situation of a macroeconomic "underemployment equili-

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1   For further details see also King (1999).

2   See, for instance, The Economist: Could it happen again? (February 20, 1999).

brium" (Krugman, 1998). It is vital to consider both problems when formulating monetary policy strategies, as traditional strategies have proven inadequate to tackle them.[1]) In any case, the Japanese example shows that macroeconomic "equilibria" are not necessarily "good" for economic policy, but nonetheless often turn out to be quite stable. This means that monetary policy has to act swiftly, i.e. before such an equilibrium has become established. At the same time, the problems resulting from compensatory economic policies and the role of harmonized economic policies are gaining new importance.

Structurally low inflation rates substantially change the perspective of monetary policy, as Akerlof, Dickens and Perry (1995a and 1996b) have demonstrated. An analysis of these aspects raises a lot of new questions as regards monetary policy instruments (Johnson, Small and Tyron, 1999) and transmission mechanisms; none of these questions has been answered satisfactorily so far.

– Do different stages in cycles require different monetary policy instruments?
– Which transmission mechanisms become important under these circumstances, and what answers can we provide if we use the established type of analysis focused strongly on the interest rate mechanism?

There is no doubt that the Eurosystem's monetary policy is structurally capable of responding flexibly to a range of different challenges. It remains to be seen, however, whether our current economic expertise is sufficient to respond fairly well, at least, to these new challenges; in any case, these are problems that are certainly not intrinsic to the monetary policy newly formulated by Monetary Union.

3.2 Asset Prices, Exchange Rates and Financial Market Stability: The Case of the U.S.A.

It is probably not possible to fully comprehend the case of Japan without taking into consideration the boom in stock and real estate prices in the 1980s. The bursting of the bubble at the beginning of the 1990s, which was partly triggered by monetary policy, marked the beginning of Japan's predicament.

Price bubbles on asset, and especially financial, markets are not restricted to Japan or to stagnating economies. On the contrary, in the light of increasingly recurring instabilities on the financial markets, it seems that asset price inflation is a much more important cause of general deflation and inflation effects than developments on the goods and factor markets (Bernanke and Gertler, 1999; Cogley, 1999). However, we still do not know what exactly determines asset prices and their often sudden rises and falls, neither do we know what final outcome these price developments have. How should economic policymakers deal with these unresolved questions?

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1   A similar fundamental aspect of monetary policy is the question of the effectiveness of monetary policy in a "cash-free" economy, as described, for instance, by Friedman (1999) or Henckel et al. (1999).

The case of the U.S.A. demonstrates a situation in which a central bank may end up tying its own hands when asset prices boom in a thriving economy and economic policy is successful.[1]) Even in a period of sustained economic growth, the risk of a share price crash can limit the room for maneuver for monetary policy to such an extent that the primary monetary targets can be pursued only to a limited extent. In fact, any kind of instability on the financial markets, especially exchange rate risks, can place similarly substantial constraints on monetary policy (Crockett, 1997).

As financial markets and financial assets expand further, such effects are bound to become increasingly relevant to monetary policy.

3.3 Monetary Policy and New Economy

One of the key political challenges of the next decade will be to ascertain whether a New Economy really exists and, if it does, to assess its implications. The U.S. economy has witnessed an economic upswing for more than nine consecutive years. The expansion has accelerated year by year and has lasted longer than anticipated. Even though growth has stayed vigorous, unemployment low and capacity utilization high, inflation has remained subdued, especially because productivity also moved into a higher growth path.

There is no ultimately convincing explanation for these two phenomena, neither for the exceptional durability of the upturn nor for the separation of price developments and economic growth. The only thing that seems to be clear is that something has happened in the U.S.A. that could mark a structural break in the long-term trend of growth and productivity. The reasons for this are just as unclear as whether similar phenomena could turn up in Europe.[2])

The concepts usually associated with the term New Economy are linked with the rapid development of information and communications technologies. While individual cases may be identified that are evidence of the significance of these factors, their systematic role has not been proven yet.

The existence of a New Economy, and the phenomenon of faster inflation-free growth, which it obviously can sustain, would have a massive impact on monetary policy (Orphanides, 2000). If a higher, inflation-free growth path really exists, it will be necessary to redefine monetary policy. This, in turn, will give rise to doubts about the appropriate monetary policy strategies, at least for a transition period, until the new framework can be assessed. But again this is definitely not a phenomenon solely linked with the creation of EMU and the Eurosystem's monetary policy. The New Economy is a challenge monetary policymakers have to face worldwide.

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1   See "Greenspan in der Geldpolitischen Zwickmühle," an article describing a situation in which the Fed's hands are tied in BHF-Bank Wirtschaftsdienst (2000).

2   Scientific literature on the various aspects of New Economy is still scarce, but recommended reading includes, for instance, Gordon (1998), McGuckin and Stiroh (1999), OECD (2000), Oliner and Sichel (2000), Stiroh (1999) and Zarnovitz (1999).

4   Conclusion

The Eurosystem's monetary policy and monetary policy strategy have been central to the monetary policy debate since the transition to EMU, which has not come as a surprise, considering the historic dimension of the creation of EMU and a single monetary policy for eleven EU Member States.

Leaving aside the factor history, however, it is difficult to see the point of so much critical interest in the Eurosystem's monetary policy. Europe benefited from Monetary Union long before it was actually established; negative international developments, such as the financial crisis of 1998, did not hit the EU as hard as before EMU. Also, the transition to Stage Three of EMU and a single monetary policy was smooth, despite fears to the contrary. Finally, the Eurosystem's stability performance in the first 18 months was quite impressive, and international forecasts predict persistent price stability also in the next few years.

The Eurosystem's monetary policy strategy has proved very flexible and has succeeded in tackling a wide range of different challenges over the past 18 months. At the same time, the Eurosystem had to disappoint those who hoped that its monetary policy strategy would be an unmodified continuation of national strategies. In fact, this was never considered a realistic option, given the fundamental changes and uncertainties that the harmonization of the monetary policies of eleven countries and their central banks and the creation of a single monetary policy entailed.

Nevertheless, the Eurosystem's monetary policy strategy is in fact based on the experience of the national central banks. It blends components of monetary and inflation targeting. This pragmatic approach is reflected in the two-pillar strategy of setting a reference value for M3 and choosing a range of indicators for the assessment of the risks to price stability. Within this framework, the much discussed exchange rate of the euro is an indicator for price risks, but certainly not a monetary policy target per se.

In practice, the Eurosystem's monetary policy strategy has done well since the beginning of EMU. Above all, it should be noted that it served as a viable basis for monetary policy decisions when deflation risks were identified in early 1999 but also when inflation risks augmented and economic growth gathered pace in the fall of the same year. At the same time, the changeover was, not surprisingly, accompanied by a number of uncertainties, but such uncertainties are not specific to the changeover. These open questions range from doubts about the usefulness of the money aggregate M3 as an indicator after the changeover to Stage Three of Monetary Union to the uncertainty about the role of a currency's exchange rate in the monetary policy strategy of a large economic area in general. Experience has shown that especially the latter question is not exclusively linked to the Eurosystem, but also affects national central banks like the Bank of England or the Bank of Japan.

With all the discussion about the Eurosystem's monetary policy, it is easy to lose sight of the central challenges that monetary policy will have to face in the future. Over the past decade, monetary policy and its theoretical basis have increasingly become key topics of discussion. The attention of

economic policymakers focused on new aspects, like the institutional framework of monetary policy and its impact on the real economy or the transmission mechanism. Three examples illustrate this trend: the threat of deflation and the liquidity trap in Japan, the risks of asset price bubbles in the U.S.A. and the implications of the existence of a New Economy for monetary policy. Monetary policy has to address these and similar questions as soon as possible to strengthen its capacity to tackle the challenges of the new millennium.

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The Credibility of the Eurosystem

Martin Schürz

1 Introduction

The term credibility crops up in economic policy debates a lot. Often, it is simply a commonplace, cited as an argument for policy recommendations, possibly cited even to justify opposing positions in the same discussion. An issue that is seldom raised in this context is what the catchword credibility stands for.

What is, in fact, meant by credibility, and how can the concept be applied to the Eurosystem? The first part of this paper discusses the conclusions major economic studies have reached on this subject. The second part examines the specific issue of the determinants of the credibility of the Eurosystem.

The concept of credibility relates to human relationships with an intertemporal dimension. Webster's Dictionary defines credibility as *"the ability to have one's statements accepted as factual or one's professed motives accepted as the true ones."*[1]) The former Vice Chairman of the Fed, Alan Blinder, defines credibility as *"matching deeds to words: A central bank is credible if people believe it will do what it says"* (1999, p. 5) and describes its characteristics as follows: *"Credibility means that your pronouncements are believed even though you are bound by no rule and may even have a short-term incentive to renege. In the real world, such credibility … is painstakingly built up by a history of matching deeds to words. A central bank that consistently does what it says will acquire credibility by this definition almost regardless of the institutional structure."* (Blinder, 1998, p. 65)

The Eurosystem, too, places much stress on the importance of matching words with deeds: *"The key to credibility and transparency is not to promise more than one can deliver."* (Issing, 1999b, p. 517) The academic literature on the subject casts doubt on such a view, though: *"Presumably, agents do not just listen to policymakers' words but also judge their underlying preferences and incentives. Targets are easy to announce but may be hard to deliver."* (Bomfim and Rudebusch, 1997, p. 7)

2 Discussion of the Credibility of Monetary Policy in Economic Literature

Roughly parallel in time to the decline of national sovereignty in economic policy, increased significance came to be attached in economics to the concept of credibility, and analysts' conception of how economic agents form expectations underwent a change.

As there is scant evidence about the factors that influence people's investment and consumption decisions, economic researchers make assumptions about the formation of expectations. In the 1960s and 1970s, most macroeconomic models were based on the notion that economic agents develop expectations on the basis of past and present information (adaptive expectations model). As the theory of rational expectations gained ground, however, economic models increasingly assumed that economic decisions are not affected by people's previous experiences alone – people also tend to take into account any information they have about prospective economic policy actions. *Lucas,* in his critique of the adaptive expectations

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1   The definition of reputation in Webster's Dictionary is *"the fact of being highly esteemed."*

hypothesis, first noted the significance of the anticipated effects of prospective government action (Lucas, 1976). According to Lucas, people would revise their expectations in light of major prospective changes in economic policy.[1]) By conceiving individuals as *"forward-looking agents,"* the theory of rational expectations gives considerable prominence to the credibility of economic policy actions.

Strictly speaking, the theory of rational expectations is not a *theory* but only a *hypothesis* which assumes the rational formation of expectations. This permits simplifications in the modeling of strategic interactions and model calculations. The assumption of rational expectations serves as a substitute for an unanalyzed process of expectation formation. Psychological, sociological, cultural and ethnological approaches to expectations are ignored.

In game theory, credibility is treated as a problem of dynamic inconsistency. Rational behavior being assumed, the focus of the mathematically complex game theory metaphors is on formalization of the incentives. The time inconsistency literature thus stresses the importance of binding mechanisms that prevent *"cheap talk"* in strategic interactions (Farrell, 1993). Agents will be credible if they have an incentive to maintain their behavior even if the situation has changed.[2])

Time inconsistency studies often neglect political and economic effects or social factors such as power, group influence or habits. The time inconsistency literature is, in fact, based on simplistic implicit assumptions about human behavior. Individuals are conceived of as senders and receivers of external stimuli.[3])

In a seminal paper published in the mid-1970s, Kydland and Prescott drew attention to the incentives for politicians to pursue short-term growth and employment objectives associated with negative long-term effects. During election years, opportunistic governments would seek to improve their chances of re-election by aiming for higher economic growth at the expense of rising inflation. Examples can be constructed taking governments with ideological preferences that incline them to attach greater importance to economic growth than to price stability.

However, as economic agents respond to short-term incentives by rapidly adjusting their expectations, such incentives will be reflected in wage demands and price setting. This will lead to a — in welfare terms —

1   Examples of such economic policy announcements are the Thatcher disinflation of 1979 and the change in U.S. monetary policy between 1979 and 1982 (Volcker disinflation).
     The minutes of FOMC meetings show that the theory of rational expectations played a role in discussions of credibility in relation to monetary policy (a point established by Faust and Svenson, 1998). More significant, however, was a broad view of credibility based on adaptive expectations. According to this, the past success of central banks shapes their future reputation. The methodological contradiction whereby internal calculations of the Fed's credibility were based on the assumption of the existence of "forward-looking agents" but the economic policy discussions of the Fed's decision-making body — the Federal Open Market Committee (FOMC) — rested on that of adaptive expectations, remained unresolved.
2   Seen in this way, time inconsistency is equivalent to lack of credibility and time consistency to credibility.
3   The parables chosen as illustrations of real life often reveal more about the authors' ideological background than about the supposedly objective character of analytical time inconsistency problems (Mishkin, 1996, p. 7; Chang, 1998).

suboptimal outcome of an inflationary spurt not matched by additional economic growth. As the world of models is predicated on rational agents, politicians are unable to cheat the population about their incentives.

Pioneered by the academic work of Kydland and Prescott (1977), and Barro and Gordon (1983a, 1983b), a broad consensus has evolved in the scientific community on the validity of two economic propositions: that the long-term Phillips curve is vertical, i.e. inflation has no sustained effect on economic growth; and that government has an incentive to seek a surprise increase in inflation.[1] Other time inconsistency problems, such as the behavior of central banks during financial crises or in deflationary environments, have received little attention.

If a central bank monetary policy follows rules the noncompliance with which would entail costs for the institution, this should enhance its credibility. The best-known policy proposal along these lines was that advanced by Milton Friedman, who argued for the adoption of a given rate of money supply growth as a binding rule. Other popular suggestions of the recent past include McCallum's rule, Taylor's rule and Svenson's rule.[2]

There is also a belief that the credibility of a central bank can be underpinned by establishing optimal contracts. The independent central bank is given incentives to optimize economic welfare (Persson and Tabellini, 1993). This takes the form of contracts between the principal (the government or the general public) and the central bank (the agent). Walsh (1995) demonstrates that an optimal contract would tie the remuneration of the monetary decision-maker to the inflation rate or monetary growth achieved.[3]

A central bank that is not subject to any institutional constraints or is not given adequate incentives will require a strong reputation as a source of credibility. Barro and Gordon (1983b) investigated the role of reputation in repeated games.[4] The central bank and private agents interact over a number of time periods. This results in an intertemporal goal conflict. While the central bank can outwit collective bargaining partners with surprise inflation in a one-shot game, this is no longer the case in repeated games. The central bank will thus not pursue short-term economic objectives, because if it did its reputation might be tarnished.[5]

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1   Blinder (1997) and McCallum (1997) argue that rational central bankers will have no inclination to tolerate inflation, meaning the central problem of time inconsistency is a thing of the past. An alternative explanation is that the problem of high inflation rates resulted from macroeconomic mismanagement in the 1960s and 1970s, while the low inflation experienced in the 1990s may have changed the context for central banks' credibility.

2   Under McCallum's rule, a target nominal GDP rate is set. Taylor's rule concerns the reaction of a central bank to fluctuations in inflation and output fluctuations. Svenson's rule is a modified version of a direct inflation target (McCallum, 1988; Taylor, 1993; Svenson, 1999).

3   In New Zealand the governor is subject to sanctions going as far as dismissal for missing the inflation target.

4   Employers and employees agree in advance on a nominally fixed wage. As it is assumed that the central bank also has an employment target, the monetary decision-makers have an incentive to create surprise inflation, so as to reduce real wages.

5   However, repeated games result in multiple equilibria, thus raising the question as to which of a multiplicity of possible solutions to select.

Rogoff (1985) recommended solving the credibility problem by appointing a conservative central banker. This person must be more inflation averse than the median voter. The people, or policymakers, appoint a monetary policymaker of whom it may be safely assumed that he/she will not seek to provoke surprise inflation. The choice of a central banker whose preferences diverge from those of the people is a problematical analytical construct.[1]) Why should people who have recognised their inherent inflationary bias be incapable of learning to do better? And why should people who are unable to change their inflationary tendencies not choose a central banker with different preferences?

The image of Odysseus and the sirens is often labored in this connection. However, the figure of Odysseus listening to the sirens' song while chained to the ship's mast is an inappropriate metaphor for an independent central bank. Odysseus' ruse consists in attaining both objectives – listening to the seductive melodies without losing his hold on rationality. In the case of *inflationary bias,* however, the aim is only to resolve a conflict arising from the intertemporal divergence of economic policy incentives.[2])

Neither does the appointment of a Rogoff-type central banker solve all theoretical problems. The monetary policy modeled would be suboptimal, as it would be insufficiently flexible to react appropriately to a crisis. Because of this, Lohmann (1992) suggested a ruling whereby the political system would be permitted to overrule decisions of the independent central bank in certain exceptional cases.

Blinder (1998) concludes that the findings of the economic literature on the issue of credibility are of only limited relevance. *"In central banking circles it is viewed as obvious that the accumulation and destruction of reputational capital more closely resembles adaptive than rational expectations – it lags behind reality. Here, I think, central bankers are closer to the truth than the economic theorists."* (Blinder, 1998, p. 44)

3 The Credibility of the Eurosystem as an Institutional Goal

While the credibility of the U.S. Federal Reserve has tended to be inextricably linked with the personal credibility of its members – the Federal Open Market Committee is a body dominated by its chairperson – the Eurosystem aims at achieving and maintaining institutional credibility (Issing, 1999b). Credibility based on personal reputations is inherently fragile, as it depends on individual characteristics, and may collapse during

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1   Alan Blinder (1998) suspects that this is a typical example of economic research in action. An economist notices that a given institutional constellation works well in practice, and thereafter demonstrates that it can also be incorporated in a model. For a different point of view, see Chang (1998): "Rogoff's analysis may explain why central bankers are often known to be 'hawkish' on inflation: according to Rogoff's theory this position would be a social response to the credibility problem in central banking."

2   In game theory, a "type" is determined, and is then no longer altered, as this would lend an undesirably ad hoc character to the analysis. In real life, it is scarcely possible to assume rigid sets of preferences on the part of decision-makers and of society as a whole. In the world of Rogoff's model, society is clever enough to be aware of its inflationary bias, but is incapable of remedying it. It needs a conservative central banker, who must remain true to his/her conservative attitude throughout his/her term of office.

transitional periods, e.g. the resignation of the governor (Mishkin, 1999).[1]
Institutional credibility is, in all events, not exposed to this risk.

There are a number of reasons why the Eurosystem is seeking to gain credibility:

1. Studies based on rational expectations models have shown that the real economic costs of disinflation are lower when the private sector actually believes the central bank (Ball, 1991, 1994; Bomfim and Rudebusch, 1997). Under circumstances of low central bank credibility disinflation will be associated with greater economic damage. If the central bank announces that it is targeting a lower inflation rate, and wages and prices accordingly adjust in advance to this, then credibility will have helped achieve a better outcome in welfare terms.[2]

   The link between central bank credibility and low costs of disinflation is, however, empirically questionable.[3] Bernanke et al. (1998) argue that inflation expectations do not directly adjust to announced inflation targets. There has also been virtually no decline in the "sacrifice ratio" in those countries that have moved to a straight inflation-based approach in their monetary policy (Mishkin, 1999, p. 25).

2. From an institutional perspective, credibility can be seen as helpful in crises (see the results of a survey by Blinder of central bankers' and academic economists' opinions, 1999). If a central bank is compelled to alter its strategy, this will be easier if it has already acquired credibility.[4]

3. Broader based social scientific approaches to credibility take social influences as their starting point. The importance of the credibility of economic policy arises from the fact that its effectiveness depends on the behavior of other agents. Credibility is thus related to power or the lack thereof (Grabel, 2000). If a given form of behavior cannot be imposed, and the cooperation of other social agents is required, the importance of credibility to economic policy will be greater. If, for instance, capital flows can no longer be limited by controls on the movement of capital, then economic policymakers will have to constantly strive to retain investors' confidence.

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1   This is also the tentative result of a questionnaire sent to the chief economists of the Fed's primary dealers (see Schürz 2000a: Credibility of the Fed and the ESCB: a comparative research project mimeo). Market analysts see credibility as a matter not just of professional qualifications, but also of factors such as general education, ability to put across complex subjects in easily understood terms, openness and moral standing.

2   Clarida, Gali and Gertler (1999) show that there are also credibility gains when a central bank does not attempt to raise output beyond the sustainable rate of growth. In their model, short-term price movements are also influenced by expectations.

3   The lack of empirical evidence for the impact of credibility has often led to the introduction of central bank independence as an explanatory variable. This is analytically prolematic, as the question being investigated, namely that of the determinants of credibility, is reintroduced into the analysis as a definition. Moreover, definitions of central bank independence suffer from similar analytical problems to those of credibility.

4   The responses to Blinder's questionnaire (1999) reveal the methodological conflicts between central banks' conceptions of credibility and formalized academic descriptions. The Barro and Gordon model assumes perfect information. On this assumption, credibility would not be an "asset to be exploited in a crisis," as "rational agents" would not allow themselves to be misled by the central bank.

4 Measurement of Monetary Credibility

Credibility is not observable. Moreover, it is not limited to the two alternatives, "credible" or "noncredible." Rather, central banks are more or less credible, and there is no single yardstick for measuring credibility.[1]

How can we, in spite of this, attempt to quantify credibility? Monetary growth can immediately be excluded as a measure. Even on the assumption that a central bank were able to exercise complete control over the money supply, it would not be possible to compare private forecasts and monetary growth, because there are no surveys of private expectations about shifts in monetary aggregates.

If a central bank publicly announces an inflation target, this can be compared with the forecasts of economic research institutes, and the expectations of independent experts and households.[2] *Target credibility* would then be the degree of congruence between the announced target and private inflation expectations. In the case of a completely credible central bank the announced target would be reflected in the private sector's expectations.

This methodological approach is questionable for a number of reasons. Inflation surveys sometimes have too short a time horizon to permit comparison with medium-term monetary policies, the effects of which may have a lag of up to 24 months. Inflation expectations may also be low for the simple reason that the level of inflation has already been low in the past. Moreover, inflation expectations need not necessarily determine behavior with regard to consumption and investment decisions.

An indirect means of obtaining quantitative information about inflation expectations is that of observing the behavior of bond yields with different maturities (see Haldane, 1999).[3] On the basis of the hypothesis of the maturity structure of interest rates, it is assumed that long-term interest rates will be equal to expected future short-term rates plus an uncertainty premium. Monetary policy will influence investors' expectations about the future level of money market interest rates. If investors' expectations improve, then the uncertainty premium will decrease, and the long-term interest rates that drive monetary transmission mechanisms will be close to the levels desired by the central bank. In the case of a completely credible monetary policy, inflation expectations would thus be tied to that policy.

However, as the reaction of market interest rates to changes in key lending rates represents a combination of inflation expectations, anticipated future movements in interest rates and changes in real rates of return, and it is difficult to distinguish analytically between the different components, this is an inadequate measure of credibility. Market rates may rise or fall when the central bank raises its discount rates. It would thus be premature to

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1   Stanley Fischer (1995) notes that credibility is a "slippery concept." It is not even clear whether credibility follows an asymmetrical pattern in the sense that it takes a long time to build up but is quickly lost.

2   The Governing Council of the ECB has defined price stability as a medium-term rate of increase in the HCPI of less than 2%. However, this should not be confused with an inflation target.

3   This, too, raises analytical difficulties. For instance, the low capital market yields in Japan in 1999 provide no indications as to the credibility of the Bank of Japan; on the contrary, it was acting in a liquidity trap.

draw conclusions about the reputation of the Eurosystem from declining long-term interest rates in the euro area.

Such calculations implicitly assume that monetary credibility is synonymous with anti-inflationary credentials. However, as the causes of inflation are not exclusively monetary, this is an oversimplification. For instance, monetary policy is responsible neither for price movements caused by supply shocks such as oil price rises, nor for increases in inflation due to unwise wage settlements.[1] Moreover, monetary policy has a number of tasks, though price stability is generally viewed as the primary objective. These range from providing a conducive climate for the attainment of overall economic goals all the way to maintaining the stability of financial markets.[2] The behavior of a central bank during financial crises may add to its credibility.[3] Alan Blinder also believes that a central bank's contribution towards meeting targets for the real economy can increase its credibility.[4] This being so, the overall conduct of central banks, and its attempts to reconcile different, sometimes conflicting economic policy goals, needs to be included in an analysis of their credibility.

5 Determinants of the Credibility of the Eurosystem

As there is no satisfactory quantitative measure of the credibility of the Eurosystem, a variety of factors influencing it are discussed below.

In principle, monetary success will tend to enhance credibility. The Eurosystem can point to low inflation in the euro area during its first 15 months, as well as a decline in unemployment, and a general absence of friction with other policies. However, as the Eurosystem does not yet have a long track record, its performance cannot yet have a decisive impact.[5]

The Eurosystem has a web of long-term relationships with a variety of social agents. Its relations with the political system, financial markets and the general public depend on trust. The Eurosystem is subject to certain rules, but – apart from its independence and the arrangements governing its accountability – it has no further institutional incentives or commitments.

The notion that a good reputation might be sufficient to confer monetary credibility is not substantiated by existing analyses. Given

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1   The reputation of the Eurosystem could thus theoretically rise or fall without its actually being responsible for the level of inflation (according to neoclassical theory, companies and private consumers will not constantly allow themselves to be misled).

2   Thus the U.S. central bank has a number of statutory objectives of equal weight, and the ESCB has several, clearly prioritized objectives (ECB, 1999).

3   Economists have endorsed the provision of liquidity after the stock market crash of October 1987 despite the absence of a formal theoretical framework for this assessment (Clarida, Gali and Gertler, 1999, p. 80).

4   Conversation with the former Vice-Chairman of the Fed, Alan Blinder, on December 4, 1999. An analysis of the minutes of FOMC meetings from 1987 to 1994 shows that monetary decision-makers take a far broader view of credibility. The following example illustrates this point: During an economic downturn that threatened to turn into a recession, the Chairman of the Fed, Alan Greenspan, spoke of credibility in connection with the contribution of monetary policy to the real economy: "If we could come through this period even with a mild recession, or preferably none whatever, I think the credibility of this institution would be such by the fall of 1990 that we could probably write our own ticket in that respect."

5   Due to the long lags in the transmission process, it will be some years before the success of the Eurosystem can be gauged.

incomplete contracts, attention would have to focus on the category of trust.[1]) Trust is primarily a sociological category. Giddens (1995) defines trust as *"belief in the reliability of a person or system in respect of a given amount of results or events."* This trust is based on a *"belief in the honesty or liking of another person, or in the rightness of abstract principles (technical knowledge)."* (1995, p. 49) Trust is certainly less easy to model than time consistency, as it is a more complex concept, but it has the advantage of providing a more adequate description of the uncertainty inherent in the reality of monetary policy.[2])

In situations of incomplete contracts and asymmetrical information, trust can be seen as a social strategy that provides a substitute for rules.[3]) Relationships built on trust are essentially fragile in nature. They call for a considerable effort of learning, and are prone to crisis.

5.1 Institutional Determinants of the Credibility of the Eurosystem

Normative economic analyses of monetary credibility tend to stress the importance of the institutional independence of the central bank. The central bank should not be dependent on agents which are *competing* for shares of GDP. The purpose of the autonomy of the Eurosystem in its monetary decision-making – that is, its immunity from short-term political incentives – is to solve a problem of collective action. Grilli et al. (1991) emphasize that *"the primary advantage of an independent central bank is its credibility."*

However, central bank independence only ensures that a specific – perhaps empirically rather insignificant – time inconsistency problem is solved, namely the opportunity open to politicians for triggering surprise inflation (Persson and Tabellini, 1990).[4]) The independent central bank does not solve the general problem of dynamic inconsistency, but merely transfers it from the level of politics to that of the central bank (Posen, 1993; McCallum, 1995).

More far-reaching proposals, along the lines of a direct inflation target, optimal contracts or monetary rules, are thus aimed at constraining the behavior of the independent institution. To such notions, the ECB's chief economist replies, *"It is one thing to develop a rule from an academic perspective, and quite another to be responsible for its monetary implementation."* (Othmar Issing, interview with the Frankfurter Allgemeine Zeitung, February 14, 2000)

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1   *"We remain convinced of the strength of the euro. This conviction is based on sound analysis, and on our confidence that the markets and the public understand us." (Othmar Issing, interview with the Süddeutsche Zeitung, October 18, 1999)*

2   *The current debate (May 2000) on the exchange rate of the euro to the U.S. dollar illustrates the importance of confidence. Despite the fact that a given exchange rate is not a target of the Eurosystem, public and media discussion of the credibility of the Eurosystem's monetary policy focuses on this exogenous variable.*

3   *See Lorenz (1999). Trust may be based on experience, and it may be based on characteristics or institutions.*

4   *In the literature of time inconsistency, surprise inflation is assumed to affect growth. In reality, changes in key lending rates first affect growth and employment, and only then feed through to the inflation rate.*

5.1.1 Transparency

The Eurosystem reports regularly and extensively on economic developments in the euro area, as well as on subjects of special interest.[1] Academic critics of the Eurosystem's monetary strategy often call for greater transparency and argue that this would increase the system's credibility. Other central banks not bound by rules, including the U.S. central bank, are also exposed to similar charges of lack of transparency. Their *"'just do it' strategy suffers from a lack of transparency, which leads to confusion in the market place, a lack of accountability of the central bank and a missed opportunity to focus the public and the politicians on the need for a long-run orientation of monetary policy."* (Mishkin, 1999, p. 37) Many academics fault inconsistencies between theoretical monetary strategy and actual policy, concluding that the Eurosystem therefore suffers from credibility problems (CEFS, 1999; Buiter, 1999).

The criticism of the Eurosystem's monetary strategy, and the simultaneous acknowledgement of its successes (CEPR, 2000) show how difficult it is to arrive at a consistent evaluation of its credibility. The initial problems encountered by the Eurosystem in communicating its policy need not detract from its credibility. However, the divergent positions taken by decision-makers do hinder interpretation by market analysts, as the latter are compelled to weigh statements on monetary policy against each other.

In the literature, on the one hand proponents of a direct inflation strategy highlight the importance of transparency as an integral element of this strategy, while on the other, even proponents of the banking secrecy literature demand greater transparency (Goodfriend, 1986). According to these positions, the necessity for a high degree of transparency is solely a matter of efficiency. A consistent and transparent monetary policy is to influence expectations, which have grown in importance as a result of market liberalization. If market analysts want the Eurosystem to display greater transparency, this has little to do with credibility, but much rather reflects their interest in anticipating the ECB's imminent interest rate moves.

Transparency implicitly supplies monetary decision-makers with an incentive to give consistent reasons for their strategic thinking and decisions. As the principal (the population of the euro area) will find it easier to monitor a transparent monetary policy, there is a greater incentive for the agents (the Eurosystem) to keep to their announced monetary policies. Transparency will only contribute to the credibility of the system if it increases public approval. This brings us to the question of the link between accountability and credibility.[2]

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1   *In its Monthly Bulletins, the Eurosystem reports on economic developments in the euro area. After the first Governing Council meeting each month, the President of the ECB explains the considerations underlying the monetary decisions taken and answers journalists' questions. The issue of whether the Bank's internal inflation forecasts should also be published is currently under consideration. See also the discussion of the transparency of the Eurosystem's monetary policy in the Monthly Report 3/2000 of the Deutsche Bundesbank.*

2   *An instructive example of misplaced transparency is "bias talk" (the publication of the preferences of FOMC members with regard to future monetary strategy) in U.S. monetary policy, introduced in February 1999. This instrument was soon abandoned, as it tended to confuse financial markets rather than providing valuable information.*

5.1.2 The Accountability of the Eurosystem

To retain democratic legitimacy, an independent institution must be accountable for its activities. Mishkin (1999) suspects that transparency will also lead to greater accountability, as it can touch off public debates on monetary policy. This need not necessarily be the case.[1] In all events, however, transparency is a precondition of accountability. Only if monetary policy measures are argued adequately, will the principal (the population of the euro area) be able to assess the performance of the agent (the Eurosystem).

The European Central Bank is obliged to submit an annual report to the European Parliament, the ECOFIN Council, the European Commission and the European Council. The President and the other members of the Executive Board are invited to hearings of the European Parliament and the responsible committees. The Statute of the ESCB requires the publication of quarterly reports on its activities.

In a debate with Willem Buiter, a member of the Monetary Policy Committee of the Bank of England, Otmar Issing, chief economist at the ECB, argued that the activities of the Eurosystem can only be assessed ex post: *"Accountability can and should be based primarily, if not exclusively, on its observable record in fulfilling its mandate."* (Issing, 1999, p. 517) *"We also stand ready to be judged by the degree of correspondence between what we say and what we do."* (Issing, 1999, p. 518) The implicit, problematical assumption is that "what we say," i.e. what monetary policymakers say, will be a matter of broad common consent. Buiter counters that the entire monetary decision-making process and not merely its outcomes should be subject to accountability (Buiter, 1999, p. 188).

5.1.3 Cooperation

The significance of institutional cooperation in the pursuit of economic strategies and in the practical implementation is less often stressed in connection with monetary credibility.[2] If all those concerned with economic policy formulation in the euro area are committed to rapid economic growth, full employment and price stability, this will enhance the credibility of the EU with regard to economic policy, and in turn have a positive impact on monetary credibility. Where macroeconomic imbalances require correction, a restrictive monetary stance may enhance the EU's monetary reputation, thereby also benefiting the credibility of its economic policy.[3]

By contrast, restrictive monetary policies introduced in response to expansionary fiscal policies might conceivably add to the monetary

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1   *Hughes-Hallett (1999) argues that a dictator may act in a transparent manner, but that this presumably does not mean that he is accountable. Transparency also implies openness with regard to essential information. What falls under the heading "essential" is largely disputed (see the controversy between Issing and Buiter, 1999).*

2   *For a general discussion of the danger of "Stackelberg warfare" see Blackburn and Christensen (1989); for a critique of the Eurosystem see Buiter (1999), pp. 204-205.*

3   *Here, the Volcker disinflation of 1979 and the Thatcher disinflation of 1979 can be cited as examples.*

decision-makers' reputation, but the effects of such a policy mix on the credibility of EU economic policy would be negative.

6 Conclusions

Maintaining a reputation for sound monetary policy gained on the basis of institutional independence, a clear objective, a record of success, and a clear incentive not to risk the confidence thus acquired is how the Eurosystem attempts to ensure credibility.

However, as it is not clear whether the Eurosystem's reputation, which ultimately stems from its principals' confidence in it, adds up to a strong enough commitment, and is also sufficient for unforeseen crises, this paper has discussed a variety of policy approaches aimed at increasing the credibility of monetary policy. These are directed towards adding to the transparency and accountability of the Eurosystem in the formulation and implementation of monetary policy. There is certainly no optimal means of establishing the credibility of monetary policy. All the potential options have different advantages and disadvantages, as they either conflict with other objectives or oversimplify monetary policy decisions. However, it should be emphasized that, when it forms part of a wider framework of credible economic policies, monetary credibility will be of benefit to overall economic performance.

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Monetary Growth during the Changeover to Economic and Monetary Union

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1 Introduction

The monetary policy strategy of the Eurosystem[3] assigns a prominent role to money. The European Central Bank (ECB) announces a reference value for the growth rate of the broad monetary aggregate M3 which is consistent with price stability. Monetary growth exceeding the reference value over a longer term may be interpreted as a monetary overhang or as excess money supply. Since the start of Stage Three of Economic and Monetary Union (EMU), the growth of the monetary aggregate M3 has remained above the reference value. It is uncertain whether this implies the buildup of an inflationary potential. During the changeover to Stage Three of EMU, special factors may have distorted monetary growth upwards. To assess the inflationary potential correctly, it is important to know whether any such special factors have a short-term or a long-term effect, because only long-term monetary growth above the reference value would imply an upward risk to price stability.

Therefore it is crucial to identify special factors in monetary growth. Several approaches lend themselves to this purpose: The options comprise an analysis of the institutional framework, an analysis of the money demand functions and the use of time series techniques.

The analysis of institutional changes in the financial system or of the monetary policy instruments leads to the assumption that stepped-up M3 growth at the beginning of Stage Three of EMU may be linked, among other things, to portfolio shifts in the wake of the introduction of the new minimum reserve system (ECB, 2000a). It is difficult, however, to quantify the distortions caused by institutional factors.

An analysis based on a money demand function, which models the link between the demand for money, interest rates, income and the rate of inflation, might provide valuable insights. Within this framework, it is assumed that money demand behavior is adequately represented by the estimated money demand function and that the move to Stage Three of EMU did not entail any structural changes in money demand. A systematic difference or an especially large deviation of the value of the monetary aggregate as estimated by the money demand function from the actual value of the monetary aggregate, even if it is temporary, could mirror irregular influences that are not explained by the money demand function. The problem with this method is that the money demand function is assumed to be stable, a prerequisite which is difficult to verify empirically at the current stage.

This study uses the third suggested approach: Special factors affecting the growth of monetary aggregates are identified by means of a time series analysis. To this end, a univariate time series model is used to determine endogenously different types of special factors and the time at which these

special factors become effective. Moreover, the analysis determines whether the special factors have a short-term or a long-term effect.

The time series analysis is based on the premise that the dynamic pattern of monetary growth described by the model did not change after the move to Stage Three of EMU. Because this assumption applies only to monetary growth, it is less restrictive than the premises which must be accepted if the analysis is based on a money demand function. In such an analysis, the restriction extends to other money demand variables (e.g. incomes, interest rates, prices); the structural relationships between these variables are assumed to have remained unchanged after the changeover to the single currency.

A univariate time series model may be based on monthly data, which allows the use of more information about monetary growth than estimating money demand functions does, because money demand functions are based on quarterly data.

To interpret monetary growth and to identify any inflationary potential, the following aspects are analyzed: Does the time series analysis of monetary growth show any significant special influences? If so, are the effects of these nonrepetitive events temporary or permanent, that is, did these events have only a short-term effect at the beginning of Stage Three of EMU and did their influence diminish in the course of the year 1999, or do they have a lasting effect?

This study is divided into the following sections: The role of monetary aggregates in the Eurosystem's monetary policy strategy is explained in section 2; the growth of M3 and its components since the introduction of the euro is discussed in section 3; section 4 describes the time series approach, the multiplicative seasonal autoregressive integrated moving average (ARIMA) model, and the outlier adjustment procedure; the results are presented in section 5; the main conclusions are summarized in section 6.

2 The Monetary Policy Strategy of the Eurosystem and the Role of Monetary Aggregates

In its meeting of October 13, 1998, the Governing Council of the ECB decided to pursue a monetary policy strategy based on two pillars:[1]

Under this strategy, the broad monetary aggregate M3 is assigned a prominent role as a leading indicator for the development of consumer prices. Therefore, the observation of monetary growth was made the first pillar of the Eurosystem's monetary policy strategy.[2] The second pillar of the Eurosystem's strategy consists in "a broadly-based assessment of the outlook for price developments and the risks to price stability in the euro area." This assessment is made using a wide range of economic and financial variables as indicators for future price developments.[3]

1　See Brandner and Schuberth (1999) for a detailed analysis of the monetary policy strategy.

2　ECB press release. A stability-oriented monetary policy strategy for the ESCB, October 13, 1998.

3　ECB press release. A stability-oriented monetary policy strategy for the ESCB, October 13, 1998.

With its choice, the Eurosystem opted against a strategy of strict monetary targeting, as important prerequisites – the controllability of the monetary aggregate and the stability of money demand – are not guaranteed empirically. Nor does the Eurosystem pursue an inflationary targeting strategy: It announces neither an inflation target, nor does it publish an inflation forecast.

Whereas "[d]eviations of current monetary growth from the reference value would, under normal circumstances, signal risks to price stability,"[1]) there is no commitment on the part of the Governing Council of the ECB to correct deviations of monetary growth from the reference value over the short term. Interest rates will not be changed "mechanistically" in response to such deviations in an attempt to return monetary growth to the reference value (ECB, 1999b).

At its meeting on December 1, 1998, the Governing Council of the ECB set the reference value for the annual growth of the monetary aggregate M3 at +4.5%. The Governing Council of the ECB monitors monetary developments against this reference value on the basis of three-month moving averages of the monthly twelve-month growth rates for M3, taking into account that the monthly growth rates may exhibit temporary distortions.

The reference value for monetary growth was derived using three key measures: GDP growth, inflation and the velocity of circulation. The quantity equation indicates the relationship between these variables (formulated in growth rates):

$$\Delta m = \Delta p + \Delta y - \Delta v.$$

Hence the reference value for the growth of broad money Δm results from the contributions to monetary growth of the rate of inflation Δp consistent with price stability, the medium-term growth rate of real GDP Δy, and the trend in the velocity of circulation of M3 Δv.

The reference value for 1999 was derived as follows: The derivation of monetary growth consistent with price stability or which serves to attain price stability is based on the assumption of medium-term real GDP trend growth of 2 to 2½% per annum and a trend decline of velocity in the approximate range of between ½ and 1% a year. The reference value of 4.5% for M3 growth is obtained by inserting the above values (of the ranges) into the equation and assuming a rate of inflation consistent with price stability, i.e. a rate of price increase of less than 2% per annum. In December 1999, the Governing Council of the ECB confirmed the reference value of 4.5% for 2000.

3 The Development of M3 in 1999

In the discussion about what monetary policy strategy the Eurosystem should choose, it was argued that any structural changes in the financial system (such as the introduction of uniform monetary policy instruments or

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1   ECB press release. The quantitative reference value for monetary growth, December 2, 1998.

more intense competition among banks) in the wake of the changeover to EMU could trigger substitution effects between the components of M3 and longer-term investments. Hence the monetary aggregate was considered a variable which could be exposed to irregular influences at the start of Stage Three.

Indeed, the annual growth rate of M3 jumped from 4.7% over the twelve months to December 1998 to 5.8% in January 1999. While the gap to the reference value of 4.5% did not widen further in the first half of 1999, it continued to expand from the third quarter (see chart 1). Not until January 2000 did the monthly twelve-month growth rate for M3 slow to 5.2%. In February and March 2000, M3 growth accelerated again to 6.1% and 6.5%, respectively.

It is interesting to note that the key interest rate cuts at the beginning of April 1999 coincided with an annual M3 growth rate that was temporarily lower than in the previous month. When the ECB raised interest rates at the beginning of November 1999, February 2000 and March 2000, the twelve-month rates of growth were higher in each case than in the immediately preceding months.[1]) This observation may point to problems of the short-term controllability of M3.

The effect of seasonal adjustment is noteworthy: The annual rates of growth (chart 1) indicate that M3 growth deviated increasingly from the reference value in the course of 1999. However, the seasonally adjusted monthly changes in M3 growth rates do not point to a continuous acceleration in 1999.

Chart 2 shows that the pickup in M3 growth from the beginning of Stage Three was led by overnight deposits. In fact, in January 1999, this category expanded by a robust 18.1%. From mid-1999, growth eased somewhat. The strong rise in overnight deposits in 1999 may have its origins in moderate inflation, low interest rates and the associated low opportunity cost of holding liquidity.

In the course of 1999, currency in circulation rose moderately. The increase accelerated temporarily in the fourth quarter, when people built up precautionary cash reserves for the turn of the millennium; the faster pace of economic growth may have compounded this trend.

Short-term deposits exclusive of overnight deposits augmented at a generally subdued pace after the introduction of the euro. The slight steepening of the yield curve and the accompanying portfolio shifts into longer-term financial assets may explain the scaled-back demand for this category of deposits.

After holdings of marketable securities had declined sharply in the first three quarters of 1999, demand for this type of investment was spurred from November 1999. However, the rise in this deposit category may be distorted upward: Although the concept of M3 refers to monetary holdings of euro area residents only, statistical limitations do not, at the current stage, permit marketable securities held by nonresidents to be identified

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1   Moreover, the months in which interest rates were raised in fact coincided with the months in which monetary growth was strongest.

separately (ECB, 2000a). This suggests that the observed faster growth of money market fund shares and money market paper as well as of debt securities with a maturity of up to two years in the last quarter of 1999 may be overestimated.

Against this background, the analysis of M3 growth in 1999 has to deal with the following questions: Is the deviation of M3 growth from the reference value – the monetary overhang – a result of nonrepetitive events linked to the special environment at the start of Stage Three? Is the monetary overhang basically a temporary phenomenon, or is it increasing further?

4 Outlier Adjustment Using Time Series Models

Economic time series are subject to a wide variety of influences and special factors, such as shifts in economic policymaking, changes in the legal framework or changes in the definition and delimitation of variables. Such events and the ensuing distortions could result in improperly identified models and problems estimating model parameters. If an analysis is based on a model which does not take such influences and events into account, forecasts or economic policy recommendations derived from the analysis may prove wrong. One approach which increases the precision of model estimates, provides a more correct analysis of special influences, and improves forecasts is outlier determination.

If the type, onset and course of exogenous influences (also referred to as interventions) are known, an intervention analysis (Box and Tiao, 1975) can serve to determine the effects of outliers. However, if the onset and type of intervention is not known, which is usually the case, intervention analysis is unsuitable to determine possible special factors. In such a case, a different method must be chosen: The outlier adjustment procedure jointly estimates the time series model and any special factors which may be impacting on the time series. The approach determines both the onset and the type of influence. Thus outlier adjustment is suited to determining the time at which influences that are not part of "normal" time series developments arise as well as identifying the strength of these influences.[1]

The underlying data-generating process of monetary aggregates M_t (which are not affected by special factors) is specified as a multiplicative seasonal ARIMA model (Box and Jenkins, 1976):

$$(1) \quad \phi(B)\alpha(B)\Phi(B^s)\alpha^*(B^s)M_t = \theta_0 + \theta(B)\Theta(B^s)a_t, \quad a_t \; n.i.d.(0,\sigma_a^2).$$

The terms $\phi(B), \alpha(B), \Phi(B^s), \alpha^*(B^s), \theta(B), \Theta(B^s)$ are polynomials in the backshift operator B (that is $BM_t = M_{t-1}$) of the order p, d, P, D, q and Q; s denotes the season.[2] The roots of the terms $\alpha(B)$ and $\alpha^*(B)$ lie on

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1   However, if the time at which influences arise and the type of influence are known, the two methods – intervention analysis and outlier adjustment – may be combined.

2   For example $\phi(B) = 1-\phi_1 B-\phi_2 B^2-...-\phi_P B^P$ or $\Phi(B^s) = 1-\Phi_1 B^s-\Phi_2 B^{2\cdot s}-...-\Phi_P B^{P\cdot s}$.

the unit circle; the roots of the other terms lie outside the unit circle. θ_0 is a constant; a_t represents white noise. The short-form reference to this model is ARIMA $(p,d,q)x(P,D,Q)_s$.

Not the series M_t is observed, but rather the series M_t^*, which is affected by outliers

$$(2) \quad M_t^* = M_t + \sum_i^n \omega_{\chi i} f_i(t) = \frac{\theta(B)\Theta(B^s)}{\phi(B)\alpha(B)\Phi(B^s)\alpha^*(B^s)} a_t + \sum_i^n \omega_{\chi i} f_i(t),$$

with $\omega_\chi = \omega_{AO}, \omega_{LS}, \omega_{TC}, \omega_{IO}$ indicating how large the effect of the special factors $f_i(t)$ is. These special factors are modeled as a parametric function of time. In the following description of the outlier types, $I_t(t_i)$ is the indicator function of intervention i, i.e. $I_t(t_i) = 1$ if $t = t_i$ and $I_t(t_i) = 0$ otherwise. Depending on how $f_i(t)$ is modeled, four types of outliers and their effects on time series are distinguished (Chen and Liu, 1993):

– an additive outlier (AO), that is, $f_i(t) = I_t(t_i)$, is an event which has an effect only on one period in the time series (e.g. an error in data collection);

– a level shift (LS), that is, $f_i(t) = \frac{1}{1-B} I_t(t_i)$ is an event that has an impact on a time series at a particular time and whose effects are permanent. A change in the data collection mechanism or a change in the definition of the variables may cause a level shift;

– a temporary change (TC), that is, $f_i(t) = \frac{1}{1-\delta B} I_t(t_i)$ is an event which has an impact on a time series initially, with the impact diminishing over time (e.g. in the form of an exponential decay at rate δ);

– an innovational outlier (IO), that is, $f_i(t) = \frac{\theta(B)\Theta(B)}{\phi(B)\Phi(B)} I_t(t_i)$, whose impact is exercised through the process which describes the dynamic pattern of the time series (e.g. by means of the underlying ARIMA model). An IO is capable of showing the onset and further impact of an external effect. As IOs depend on the model used, unlike the other types of outliers, IOs stand for an entire class of outliers.

Analyzing the residuals of an estimated model plays a major role in the outlier adjustment procedure. Therefore it is essential to know the effects of the different types of intervention on the residuals of the model. The estimated residuals $\hat{e}_t$ contaminated with n outliers can be expressed by the following equation (no distinction is made between the estimated and the true parameters of the ARIMA model, which is assumed to be correctly specified):

$$(3) \quad \hat{e}_t = \frac{\phi(B)\alpha(B)\Phi(B^s)\alpha^*(B^s)}{\theta(B)\Theta(B^s)} M_t^* = \pi(B) M_t^* = \sum_i^n \omega_{\chi i} \pi(B) f_i(t_i) + a_t,$$

with the specification of $f_i(t)$ depending on the type of outlier.

Alternatively, the effect of an individual outlier at time t_i can be expressed as (subindex χ denotes the type of outlier):

$$(4) \qquad\qquad\qquad \hat{e}_t = \omega_\chi z_{\chi t} + a_t,$$

where $z_{\chi t} = 0$ for $t < t_i$, and $z_{\chi t} = 1$ for $t = t_i$, and for $t > t_i$:

AO: $z_{\chi(t_i+k)} = -\pi_k$

LS: $z_{\chi(t_i+k)} = 1 - \sum_{j=1}^{k} \pi_j$

TC: $z_{\chi(t_i+k)} = \delta^k - \sum_{j=1}^{k-1} \delta^{k-j}\pi_j - \pi_k$

IO: $z_{\chi(t_i+k)} = 0$

and $k \geq 1$.

The OLS estimate of the effect of an outlier at time t_i may be expressed as follows, and a standardized statistic may be developed[1])

(5a) AO : $\hat{\omega}_{AO}(t_i) = \sum_{t=t_i}^{T} \hat{e}_t z_{\chi t} \bigg/ \sum_{t=t_i}^{T} z_{\chi t}^2$ $\qquad \hat{\tau}_{AO}(t_i) = \{\hat{\omega}_{AO}(t_i)/\hat{\sigma}_a\} \left(\sum_{t=t_i}^{T} z_{\chi t}^2 \right)^{1/2}$

(5b) LS : $\hat{\omega}_{LS}(t_i) = \sum_{t=t_i}^{T} \hat{e}_t z_{\chi t} \bigg/ \sum_{t=t_i}^{T} z_{\chi t}^2$ $\qquad \hat{\tau}_{LS}(t_i) = \{\hat{\omega}_{LS}(t_i)/\hat{\sigma}_a\} \left(\sum_{t=t_i}^{T} z_{\chi t}^2 \right)^{1/2}$

(5c) TC : $\hat{\omega}_{TC}(t_i) = \sum_{t=t_i}^{T} \hat{e}_t z_{\chi t} \bigg/ \sum_{t=t_i}^{T} z_{\chi t}^2$ $\qquad \hat{\tau}_{TC}(t_i) = \{\hat{\omega}_{TC}(t_i)/\hat{\sigma}_a\} \left(\sum_{t=t_i}^{T} z_{\chi t}^2 \right)^{1/2}$

(5d) IO : $\hat{\omega}_{IO}(t_i) = \hat{e}_{t_i}$ $\qquad \hat{\tau}_{IO}(t_i) = \{\hat{\omega}_{IO}(t_i)/\hat{\sigma}_a\}$

The standardized statistics $\hat{\tau}_\chi(t_i)$ may be compared with a critical value C to assess the significance of outlier effects in the residuals (Chang et al., 1988).

Chen and Liu (1993) propose an iterative procedure to estimate the model parameters and the outliers jointly and to adjust the time series for special factors. Equations (2) and (3) are the basis for this three-step procedure, which is explained in the box below.

5 The Results of the Outlier Adjustment Procedure

Table 1 shows the type and onset of the outliers determined for the monetary aggregates M1, M2 and M3. The analysis is based on euro area monthly data for the period spanning January 1980 through March 2000 (data source: ECB) and was performed with various degrees of sensitivity toward the identification of outliers. High sensitivity means that the method identifies outliers easily (the critical value in the tests is low). A strong test – one that identifies only nonrepetitive events with a high statistical significance as outliers – is performed with a low degree of sensitivity. Hence the discussion of the results centers on tests with low and medium sensitivity to outliers.

In January 1999, an innovational outlier is identified for all three monetary aggregates. This outlier has the highest statistical significance, which means that it is the most important special factor. While the time

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1   As $\hat{\omega}_{AO}(T)=\hat{\omega}_{LS}(T)=\hat{\omega}_{TC}(T)=\hat{\omega}_{IO}(T)$, that is, as the effect of an outlier is the same for the last observed instance for each type of intervention, it is practically impossible to determine empirically the type of outlier at the end of a time series.

series analysis was expected to identify the onset of a special influence at the beginning of Stage Three of EMU, it came as a surprise that this special factor was to be identified as an innovational outlier, and not as a level shift. However, up to now, the discussion has centered on the assumption that the influences linked to the introduction of the euro led to a level shift in the monetary aggregates. Accordingly, the high annual growth rates (change on the same month of the previous year) would have resulted from a base effect only, whose impact would have ceased in January 2000.

Unlike a level shift – a one-time shift in the level of the monetary aggregate – an innovational outlier has a permanent effect. Because of the stochastic characteristics of nominal monetary aggregates (they are integrated of order two), the innovational outlier also influences long-term monetary growth. Whereas the short-term influence of the innovational outlier for M1 is somewhat different from that for M2 and M3 because the ARIMA specifications are different,[1]) the changeover to Stage Three as a special factor entailed a permanent shift in the growth rate of all aggregates.

A more in-depth analysis shows that in January 1999 the innovational outlier for M2 and M3 derives largely from M1 components. Both the difference between M1 and M2 and the difference between M3 and M2 contain short-term influences only and hence have no effect on long-term monetary growth.

Table 2 compares published and adjusted monetary growth rates. The annual rate of increase of M1 in January 1999 adjusted for outliers was 6.4 percentage points below the published annual rate of 14.7%.

The difference between the published and the adjusted growth rates in the same period is smaller for M2 and M3. Exclusive of innovational outliers, M2 growth in January 1999 is 2.9 percentage points lower than the published rate of 7.8%, and adjusted M3 growth was 1.5 percentage points lower than the published rate of 5.8%. Throughout the remainder of 1999, published M3 growth outpaced adjusted growth by 1.3 percentage points. It may be noted that M3 growth adjusted for the innovational outlier was below the reference rate until June 1999, when it began to accelerate steadily to 6.0% in March 2000.

Some 0.8 percentage point of the differential between the published and adjusted growth rate in 1999 is probably attributable to a temporary effect, perhaps caused by special institutional factors. One special factor which may have added to the considerable expansion of the monetary aggregates, above all at the beginning of 1999, was the introduction of a uniform minimum reserve system in which the holdings of required reserves are remunerated (ECB, 2000a). Hence countries which had not paid interest on minimum reserve holdings prior to the introduction of the euro entered a system in which investment in monetary aggregate components subject to minimum reserve requirements had become more attractive, resulting in an influx into the euro area of deposits and marketable financial instruments from countries outside the euro area.

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1   Model for M1: $(3,1,0)x(0,1,1)_{12}$; model for M2 and M3: $(0,1,1)x(0,1,1)_{12}$.

The analysis does not confirm the frequently cited presumption that the surge in monetary growth in January 1999 represented a one-time increase in money holdings that only temporarily raised monetary growth rates. The outcome of the time series analysis shows that the innovational outlier in January 1999 increased monetary growth not just temporarily in 1999 (by 1.3 percentage points), but permanently (by 0.5 percentage point) after February 2000.

This long-term "EMU effect" on M3 growth may be discussed in economic terms by using the quantity equation (in terms of growth rates). By definition, the pickup in monetary expansion Δm must correspond to a change, also effective at the beginning of Stage Three, in at least one other component, namely the medium-term trend of real GDP growth Δy, price developments Δp or the trend in the velocity of circulation of the monetary aggregate Δv. However, causal inferences must not be made on the basis of this definitional relationship only. Whether the dynamic effects of the Single Market, which unfold fully only with the introduction of the single currency and which are reflected by a higher trend of real GDP growth, or a higher rate of inflation, or a faster decline in the velocity of circulation explain the stepped-up monetary growth can be determined only by performing an analysis using a structural model.

6 Summary and Conclusions

Monetary growth has been above the reference value since the changeover to Stage Three of EMU, which on the one hand gives rise to the concern that a monetary overhang posing a potential inflationary risk has accumulated. On the other hand, it is assumed that monetary growth may have been distorted upward in 1999 by special factors which had only a temporary impact on monetary growth.

Within the framework of a multiplicative seasonal ARIMA model and outlier adjustment procedure, various forms of special factors affecting monetary growth are identified endogenously. A statistically highly significant innovational outlier is identified for all monetary aggregates – M1, M2 and M3 – in January 1999. As a result of this special factor effective at the start of Stage Three of EMU, monetary growth is permanently higher than "normal" monetary growth, "normal" growth being that growth which can be derived from the time series developments of the two preceding decades. The parameter estimates of the model imply that in 1999, 1.3 percentage points of M3 growth are attributable to this innovational outlier. Since the end of February 2000, this effect has come to 0.5 percentage point.

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Definition of Monetary Aggregate M3

Liabilities[1])	M1	M2	M3
Currency in circulation	×	×	×
Overnight deposits	×	×	×
Deposits with agreed maturity up to 2 years		×	×
Deposits redeemable at notice up to 3 months		×	×
Repurchase agreements			×
Money market fund shares/units and money market paper			×
Debt securities up to 2 years			×

Source: ECB (1999a).

[1]) Liabilities of the money-issuing sector and central government liabilities with a monetary character held by the money-holding sector.

M1 includes currency as well as overnight deposits. M2 comprises M1 and deposits with maturities of up to two years and deposits redeemable at notice of up to three months. M3 comprises M2 and certain marketable instruments issued by the MFI sector (repurchase agreements, debt securities with maturities of up to two years, money market fund shares/units and money market paper).

Since September 1997 the ECB has been calculating M3 on the basis of the consolidated balance sheet of the MFIs in the euro area, which is drawn up under the new harmonized money and banking statistics for the euro area (ECB, 1999b). Prior to September 1997 the ECB calculated the total of the estimated national contributions to the respective euro area monetary aggregates. These estimates were based on the national money and banking statistics, which were not fully harmonized across the euro area. To calculate the historical monetary aggregate series, the ECB used the irrevocable euro conversion rates fixed on December 31, 1998.

Since September 1998 the monetary growth rates have been calculated on the basis of monthly flows representing actual financial transactions. This takes into account fluctuations of market prices (of securities subsumed under M3 which are traded on the secondary market), exchange rate changes and revaluations.

Procedure for the Joint Estimation of the Model and Outliers

Step 1 (initial estimation)

1.1 Identify and estimate the ARIMA model with the adjusted time series (for the first iteration, use the original time series) and calculate the residuals.

1.2 Search for and determine all outliers in these residuals according to the statistics (5a to d), applying the critical value C. Remove the effect of the outlier from the residuals.

1.3 Adjust the data for the effect of the outlier and return to step 1.1. If no more outliers are found, proceed to step 2.

Step 2 (joint estimation of the model parameters and the effects of the outliers)

2.1 Estimate the effects of the outliers found in step 1 using the multiple regression model based on (3). $\hat{e}_t$ is the regressand; the corresponding $f_i(t)$ s are the regressors.

2.2 The statistics $\hat{\tau}_i = \hat{\omega}_{\chi i}/std(\hat{\omega}_{\chi i})$ are compared with the critical value C to eliminate nonsignificant outliers. Return to step 2.1 with the reduced number of outliers. If only significant outliers remain, proceed to step 2.3.

2.3 Adjust the data only for the significant outliers and reestimate the ARIMA model. If the standard error has improved by more than a chosen tolerance against the preceding estimation, return to step 2.1, if not, proceed to step 3.
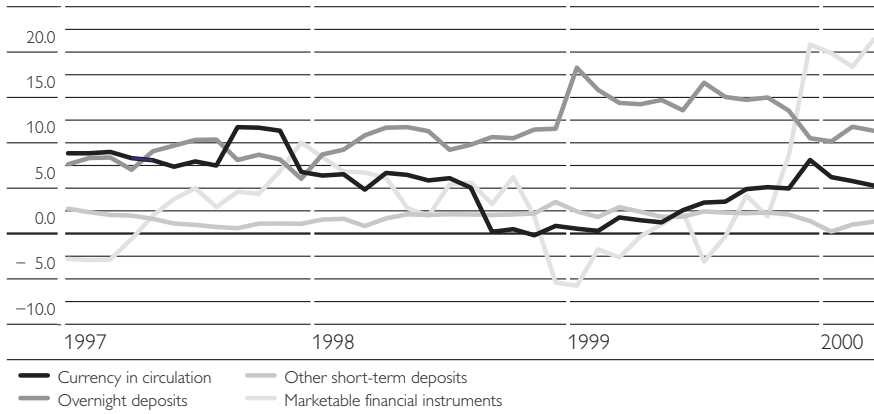
Step 3 (final parameter estimation and outlier adjustment)

3.1 The ARIMA parameters obtained in step 2.3 are the final parameters.

3.2 Compute the residuals using these parameters and the original time series.

3.3 Repeat step 1 without estimating new ARIMA parameters.

3.4 If necessary, repeat steps 2.1 and 2.2.

Chart 1

M3 Components in the Euro Area

change on previous year in %

- Currency in circulation
- Overnight deposits
- Other short-term deposits
- Marketable financial instruments

Source: ECB.

Chart 2

M3 Growth and Reference Value

change on previous year in %   %

- Annual growth rate M3 (left axis)
- Central three-month average (left axis)
- Reference value (left axis)
- Monthly change of M3, seasonally adjusted (right axis)
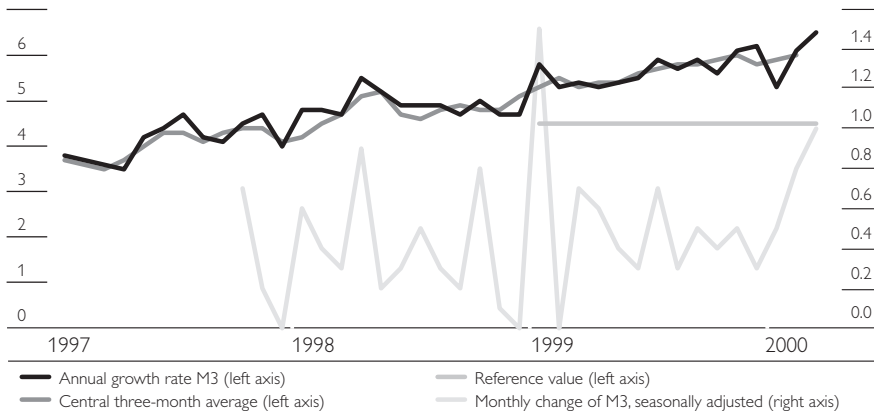
Source: ECB.

Table 1

Outliers in Monetary Aggregates[1]

	sensitivity of outlier adjustment					
	high		medium		low	
M1	1986m3	LS	1986m3	LS	1986m3	LS
	1989m12	IO	1989m12	IO		
	1997m12	TC	1997m12	TC		
	1999m1	**IO**	**1999m1**	**IO**	**1999m1**	**IO**
	1999m12	AO	1999m12	AO	1999m12	AO
	and 10 additional outliers					
M2	1991m12	AO	1991m12	AO		
	1997m12	AO	1997m12	AO	1997m12	AO
	1999m1	**IO**	**1999m1**	**IO**	**1999m1**	**IO**
	1999m12	AO	1999m12	AO	1999m12	AO
	and 11 additional outliers					
M3	1984m9	AO				
	1986m3	AO				
	1992m1	TC				
	1992m12	IO				
	1993m3	LS				
	1994m12	IO				
	1997m12	IO				
	1999m1	**IO**	**1999m1**	**IO**	**1999m1**	**IO**

[1] Estimation period: 1980m1 − 2000m3; ARIMA-models: M1: $(3,1,0)x(0,1,1)_{12}$; M2, M3: $(0,1,1)x(0,1,1)_{12}$; AO: additive outlier; IO: innovational outlier; LS: level shift; TO: temporary change; high, medium and low sensitivity refers to the critical values of the test statistics (2.7, 3.0 und 3.3).

Table 2

Euro Area Monetary Aggregates[1]

		published and adjusted					
		M 1		M 2		M 3	
		published	adjusted	published	adjusted	published	adjusted
		change on previous year in %					
1998	November	8.5	8.5	4.9	4.9	4.7	4.7
	December	9.2	9.2	6.0	4.8	4.7	4.7
1999	January	14.7	8.3	7.8	4.9	5.8	4.3
	February	12.6	8.8	6.5	4.2	5.3	4.0
	March	11.7	8.1	6.8	4.5	5.4	4.1
	April	11.5	6.3	6.3	4.0	5.3	4.0
	May	12.1	7.9	6.4	4.2	5.4	4.1
	June	11.5	7.3	6.3	4.0	5.5	4.2
	July	14.1	9.3	7.7	5.4	5.9	4.6
	August	12.8	8.4	7.0	4.7	5.7	4.4
	September	12.8	8.3	6.9	4.6	5.9	4.6
	October	13.0	8.4	7.0	4.7	5.6	4.3
	November	11.8	7.4	6.3	4.1	6.1	4.8
	December	9.8	8.2	5.1	4.2	6.2	4.9
2000	January	9.1	8.3	4.0	4.1	5.3	5.0
	February	10.4	8.2	5.1	4.6	6.1	5.6
	March	9.9	7.6	5.1	4.6	6.5	6.0

Source: ECB (2000b), OeNB.
[1] Adjusted growth rates are based on low-sensitivity outlier adjustment.

Indicators for Assessing Price Changes

Claudia Kwapil

Introduction

The monetary policy strategy of the Eurosystem is based on a definition of price stability and on two pillars which impose a clear structure on the analysis of indicators relevant to monetary policy decisions. The Eurosystem has defined price stability as an annual increase of the euro area HICP of below 2% over the medium term.[1])

The first pillar of the monetary policy strategy includes an analysis of the broad monetary aggregate M3. This indicator has been assigned a prominent role, as it is assumed that overall price trends across the euro area correlate closely with the long-term growth of this monetary aggregate.[2])

The second pillar of the strategy comprises a wide range of indicators that are used to assess the outlook for price developments and risks to price stability. These indicators, which are analyzed as components of the second pillar, have not been defined in detail, which means that the number and type of indicator are variable. New scientific findings, for example, might lead to the inclusion of additional indicators into the pillar. Among the components currently being analyzed are wage trends, exchange rates, bond prices and yield curves, price and cost indices as well as industry and consumer surveys. Inflation forecasts are another key component of the second pillar.

This article describes a number of key indicators, but does not purport to provide a complete review. Nor is it possible to quantify the extent to which these indicators influence the Governing Council's decisions or their impact on monetary policy decisions.

Consumer Prices

In analyzing price changes, the principal focus is on the consumer price index, as consumer goods and services mark the end of the production process in the economy. The prices of intermediate goods are inputs into the production process and influence the development of consumer prices through this channel. The consumer price index may therefore be seen as the indicator that summarizes the result of all inflationary or deflationary tendencies in an economy from the consumers' perspective.

Analyses of price changes across the entire euro area can be conducted with the Harmonized Index of Consumer Prices (HICP), which is published by Eurostat every month about three weeks after the end of the reporting month. The HICP is based on a basket of goods and services, with the goods being classified further into food and industrial goods.

Based on the movements in individual components it is possible to identify, retrospectively, those items in the basket that were accountable for a price rise.

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1   For a detailed description of the monetary policy strategy of the Eurosystem see "The stability-oriented monetary policy strategy of the Eurosystem," ECB Monthly Bulletin, January 1999 (www.ecb.int).

2   The first pillar of the Eurosystem's monetary policy strategy is described in detail in the article "Euro area monetary aggregates and their role in the Eurosystem's monetary policy strategy" in the ECB's Monthly Bulletin, February 1999 (www.ecb.int).

Weights of the Key Components of the Euro Area HICP

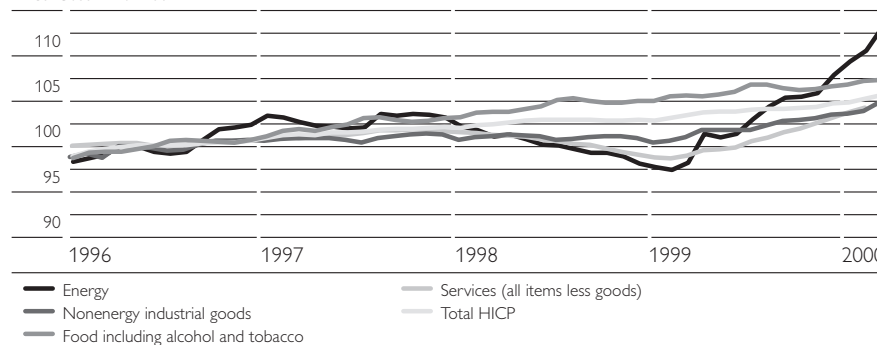|	Group weights in %
Services	36.4
Goods	63.6
Food	22.4
thereof: processed food	*13.4*
unprocessed food	*9.0*
Industrial goods	41.2
thereof: industrial goods	*32.5*
energy	*8.7*

Source: Eurostat.

As the volatile components of the basket of goods and services may cause temporary "distortions" in the overall HICP, analyses of price changes also look at indices not including these components to identify the underlying inflationary trend more accurately. In this context, a distinction is made between *"headline inflation,"* a measure that includes all items, and *core or underlying inflation,* a measure adjusted for the volatile components. A generally accepted definition or method of determining core inflation is not available. As a rule, heavily fluctuating components, such as energy prices and the prices of unprocessed food, are taken out. Other methods employ econometric procedures to filter out an inflation trend.

Chart 1

Breakdown of HICP Inflation in the Euro Area

by Key Components

Index base 1996=100

Legend:
- Energy
- Nonenergy industrial goods
- Food including alcohol and tobacco
- Services (all items less goods)
- Total HICP

Source: Eurostat.

Producer Prices

Apart from the HICP, a number of other price indices are used to analyze price changes, including in particular indices related to the production stages preceding final consumption.

The argument advanced in favor of the use of such price indices is based on the assumption that prices are calculated by adding a profit margin to the cost of production (e.g. the cost of raw materials and intermediate goods as well as personnel and capital costs). Any change in prices at an earlier stage of production therefore has an impact on prices at subsequent production

stages and, with a certain time lag, finally feeds through to the prices of consumer goods and thus to the HICP.

Such analyses frequently use the *producer price index (PPI),* which distinguishes between various stages in the production process, starting from raw materials (used in production) to intermediate goods (at the lowest production stage) to finished products (both capital goods and consumer goods). Mirroring production patterns, the euro area PPI breaks down into 47% intermediate goods prices (including raw materials), 38% consumer goods prices, and 15% capital goods prices.

If, for example, crude oil prices rise, this increase affects consumer prices through a number of different channels: on the one hand, oil prices form part of energy prices (fuels and heating materials) and, with a weight of 8.7%, are a direct component of the HICP. A price rise therefore results in an increase in consumer prices within a very short time. On the other hand, the oil price is an input price in the production chain and thus also feeds through – indirectly – to the prices of finished goods, i.e. consumer goods, with a time lag of several quarters.[1])

Chart 2

The PPI, the HICP, and Industrial Goods and Energy as HICP Components

1999=100

Legend:
- Energy
- Industrial goods
- Industrial producer prices
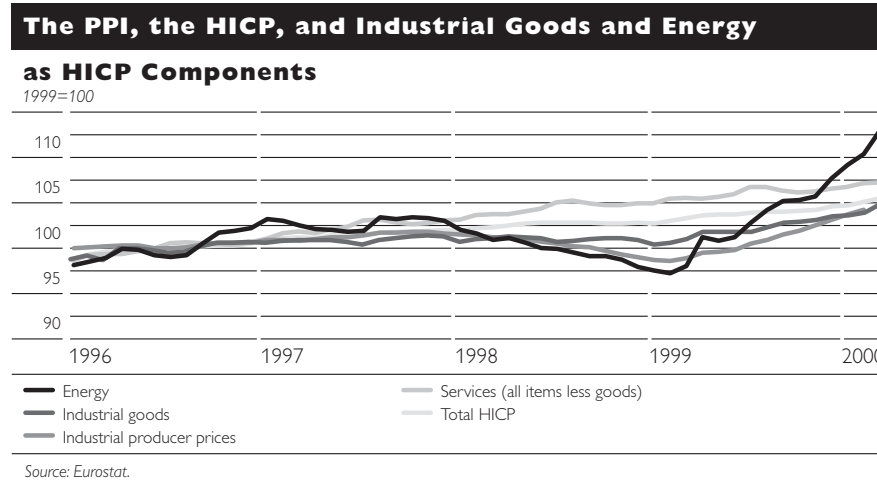- Services (all items less goods)
- Total HICP

Source: Eurostat.

Chart 2 shows that the correlation between industrial producer prices and the HICP is very weak. A look at the HICP components, however, reveals a common trend in industrial goods and industrial producer prices. The assumption that prices are determined by simply adding a profit margin to costs must, however, be qualified to some extent. In setting prices, enterprises cannot rely exclusively on mechanistic cost formulas but have to take into account the situation in their markets and in the economy at large. Increased competitive pressure, for example, may force companies to reduce their profit margins when the prices of intermediate goods rise and they find themselves unable to pass the price increases on to their customers.

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1   Box 2 "The effect of oil prices on the Harmonized Index of Consumer Prices (HICP)" in the ECB's Monthly Bulletin of September 1999, discusses the impact of the rise in oil prices on the HICP in the year 1999.

In summary, it can be noted that the correlation between the PPI and the HICP is not close. Even if many indicators may point in a certain direction, their impact may still be outweighed by other factors. Therefore, it is not advisable to use a simplifying approach.

Oil Prices

Apart from the above-described effects of oil prices on consumer prices, another mechanism is also of interest. A rise in oil prices leads to a deterioration in the euro area's terms of trade, as the countries of the euro area are net importers of crude oil. Assuming that no substitute for oil will become available in the near or medium term, an increase in the oil price constitutes a negative supply shock. This means that within an economy more resources have to be allocated to the purchase of oil and therefore fewer funds are left for other activities. As a result, less output is available to meet domestic demand. The effects on output and demand of course also critically depend on whether the rise in oil prices is short-lived or permanent.

Depending on the extent to which a change in oil prices affects output and demand, the implications for the economy as a whole will vary. If supply contracts more dramatically than demand when oil prices rise, the resulting gap may generate additional inflationary pressure. In the reverse case, inflation would be curbed.

The problem in assessing these effects is therefore, first, to determine whether a rise in oil prices is going to be temporary or permanent and, second, to analyze the extent to which output and demand in an economy will be affected.

Unit Labor Costs

Wages and salaries are significant cost factors for enterprises and thus also have an impact on prices. Whether wage rises pose a direct risk to cost and price stability depends, however, on the development of labor productivity.[1] For this reason, it is not wages but unit labor costs that enterprises view as the crucial factors in their decision-making (and price-setting) processes. Unit labor costs are defined as the relationship between per capita wage costs (gross wages, social insurance contributions, etc.) and average labor productivity or, in simpler terms, as the relationship between an economy's aggregate wage costs and real GDP. Both wage costs and labor productivity are influenced by seasonal factors.

When wages rise faster than productivity, unit labor costs go up; this may exert pressure on prices. Higher prices may then in turn trigger demands for higher wage rises and possibly lead to higher wage agreements, setting off what is known as a wage-price spiral. But, as in the case of producer prices, an increase in unit labor costs need not necessarily result in

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1   *Labor productivity is defined as the relationship between real GDP and the number of persons employed. Productivity may be raised through technical progress, which enables more output to be produced with the same input of labor. Alternatively, productivity may also rise when an unchanged level of output is produced by fewer workers.*

higher prices as, for example, counteracting movements in other cost factors (e.g. in raw materials) may offset the change in unit labor costs. Price increases may also be prevented by competitive conditions, which may force an enterprise to reduce its profit margins.[1])
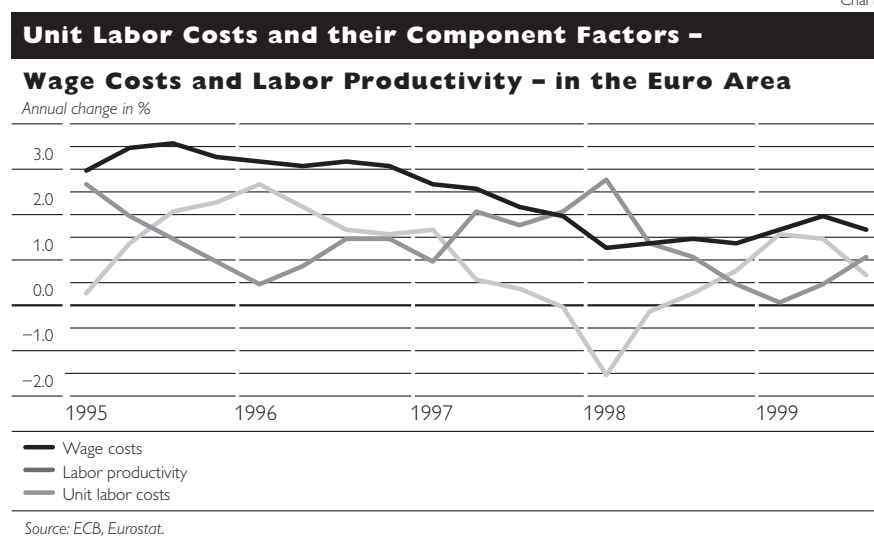

Chart 3

Unit Labor Costs and their Component Factors –

Wage Costs and Labor Productivity – in the Euro Area

Annual change in %

Wage costs
Labor productivity
Unit labor costs

Source: ECB, Eurostat.

Chart 3 shows, for example, that the slower or even negative growth in unit labor costs seen from 1996 to 1998 was caused by moderate wage increases rather than a marked advance in productivity.

Unit labor costs are also used to analyze competitiveness. A comparison of the changes in unit labor costs in the euro area with those recorded in other countries on the international market provides clues about price competitiveness. If, over the years, unit labor costs in a country rise at a slower pace than in other countries, that country's relative competitive position will improve.

As data on unit labor costs and wage costs are published with a considerable time lag, they have no leading indicator properties and are used primarily for ex-post analyses. Information on the future development of unit labor costs has to come from other sources. Collective bargaining negotiations, which provide crucial information about future wage trends for at least the coming year, are a major source of information. The number of employees covered by collective bargaining and empirical findings regarding wage drift allow valuable conclusions about future wage trends to be drawn.

Information about future wage trends is also of relevance in estimating the development of disposable income. Wages influence consumer prices not only through the costs of labor as a factor of production, but also

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1   *A study by Emery, K. M. and C. P. Chang "Do Wages Help Predict Inflation," Economic Review 01/1999, Federal Reserve Bank of Dallas, 1999, explored the indicator properties of labor costs in predicting inflation and concluded that the inflation that occurred in the U.S.A. in the 1990s had not been wage-driven.*

through disposable income. Disposable income, in turn, determines consumer demand and, thereby, the relationship between supply and demand; excess demand may put upward pressure on prices.

Exchange Rate and Import Prices

The euro exchange rate influences prices in the euro area through its effect on the prices of imported goods. A distinction is generally made between direct and indirect effects.

Direct effects come from the prices of those imported goods and services that are intended for consumption and do not influence the HICP via the production process. If the euro area is a price taker in respect of such products, any change in the exchange rate will have a proportionate effect on the euro price of the imported item and thus an immediate impact on the HICP. This direct effect is limited, however, as imports into the euro area account for only about 15% of GDP and only part of these imports are products bought by end users.

Typical examples of direct effects are crude oil and coffee prices. Provided that world market prices remain unchanged, a 10% depreciation of the euro against the U.S. dollar results in a roughly 10% increase in the respective euro-denominated prices and in a direct and immediate effect on the HICP. Apart from said products, a change in the exchange rate may also cause movements in the prices of other consumer goods. When the euro area is not a price taker, the effect on euro prices is not felt to the full extent, because producers from small exporting countries, for example, may seek to keep their euro prices stable in the event of a euro depreciation so as not to lose market share. This applies in particular when competitors making substitute products operate in the euro area.

Thus the impact of an exchange rate change on prices may vary depending on the industry and the product affected. The Single Market and EMU may have produced a structural break, which reduces the effects of exchange rate changes on euro-denominated prices. The euro area is a large economic area, a fact that may strengthen the price-setting power of euro area producers in some industries and may cause exporters into the euro area to quote their prices in euro, rather than in U.S. dollars, as in the past.

Apart from the direct effects on consumer prices, a number of indirect effects are also passed on through the production process. Such indirect effects come, first, from imported goods and services that are used in production and, in the event of a euro depreciation, may increase the producers' costs and thus their prices. Second, a temporary rise in inflation caused by a depreciation of the euro may lead to higher wage demands, which in turn may set off a wage-price-spiral and trigger further price rises. Here, the relationship between the prices of production inputs and outputs is, again, not a mechanistic one and other developments may dampen or reinforce cost increases.

An analysis of exchange rates examines not only bilateral euro exchange rates – as the one to the U.S. dollar, but, most importantly, also the effective exchange rate, which is defined as the geometric weighted average

of bilateral euro market exchange rates against the currencies of 13 partner countries.[1]) The effective exchange rate is a summary measure of the external value of the euro vis-à-vis the currencies of its most important trading partners and thus determines the aggregate effect of exchange rate changes on a national economy.[2])

Breakeven Inflation in Index-Linked Bonds

A comparison of the yields on bonds linked to price indices (inflation index-linked bonds) and the yield on nominal fixed-income securities with similar characteristics (e.g. maturities) provides some insight into inflation expectations present in the economy. Bonds that are linked to a price index carry a fixed coupon that is paid annually. The nominal coupon is calculated ex post by adding the actual inflation rate. Nominal fixed-income securities differ in that they guarantee a nominal yield and the investors bear the inflation risk. Provided that both types of bonds return the same real yield, the differential between the nominal bond yield and the real yield on an inflation index-linked bond is the so-called breakeven inflation rate, which provides an indication of current inflation expectations.

For two reasons, however, the breakeven inflation rate is not a direct measure but rather an indicator of actual inflation expectations: First, the nominal fixed-income bond also contains an inflation risk premium, which means that the nominal yield is higher because of the additional uncertainty and the breakeven inflation rate overestimates the expected inflation. Secondly, inflation index-linked bond markets are often characterized by a low level of liquidity, which means that the coupon contains a liquidity premium and inflation expectations are underestimated. As the said premiums work in opposite directions, the breakeven inflation may still by used, with proper caution, as an indicator of actual inflation expectations.

An inflation index-linked bond for the entire euro area has not been issued yet, but the French Treasury started issuing bonds linked to the French consumer price index (excluding tobacco prices) in September 1998. An analysis of these bonds provides an indicator of inflation expectations in France. To the extent to which French inflation expectations are indicators of inflation expectations in the euro area as a whole, this analysis may also provide valuable information about trends in the euro area.[3])
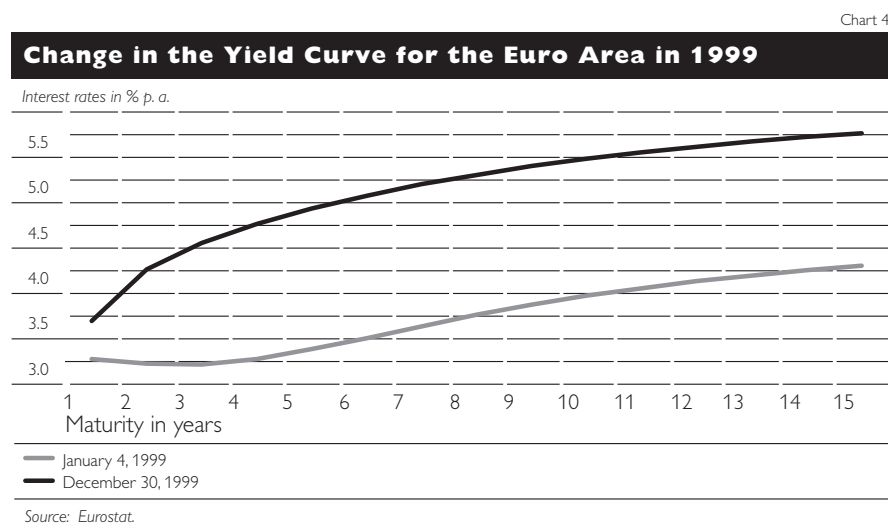
Yield Curve

A yield curve plots nominal interest rates or yields with different maturities. As a rule, yield curves show a range of yields, in ascending order, from money market rates to 10-year bonds or estimates based on market data.

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1   The 13 trading partners included in compiling the effective exchange rate index are the United States, the United Kingdom, Japan, Switzerland, Sweden, Denmark, Norway, Greece, Australia, Korea, Hong Kong, Singapore, and Canada.

2   For a detailed description of the effective exchange rate compiled by the ECB, see "Effective exchange rate for the euro" in the ECB's Monthly Bulletin of October 1999.

3   See also the ECB's analysis in its Monthly Bulletin, February 1999, "Deriving inflation expectations from inflation index-linked bonds."

Chart 4 shows the shift in the yield curve between the beginning and the end of 1999.

Chart 4

Change in the Yield Curve for the Euro Area in 1999

Interest rates in % p. a.

Maturity in years

January 4, 1999
December 30, 1999

Source: Eurostat.

In the industrialized countries, the information contained in money market rates and in the yields of bond with different maturities is increasingly taken into account in analyses preceding monetary policy decisions.

Economic theory holds that current long-term nominal interest rates reflect expected real interest rates and expected inflation plus various risk premiums, including the risk premium for the uncertainty regarding future inflation. According to this theory, the steepness of the yield curve should indicate the market's expectations regarding future economic activity as well as the market participants' expectations regarding future inflation rates.

The following example is to illustrate the theoretical relationship between expectations about future economic activity and the steepness of the yield curve: If economic agents anticipate a decline in economic activity, their demand for long-term bonds will increase as they will seek to compensate the expected loss in future income by the returns earned on these bonds. Increased demand for long-term bonds will push up the price of these bonds and force yields down relative to those on short-term bonds. This forward-looking behavior of consumers implies that the yield curve will flatten in anticipation of a recession. It may even flatten to such an extent that long-term bonds yield less interest income than short-term bonds. In such a case, the yield curve is said to be inverted.

The principal problem in analyzing a yield curve is the problem of identification. An increase in the steepness of the yield curve may mean that market participants expect an acceleration in economic activity but it may also reflect the expectation of rising inflation. If these two variables are not perfectly correlated, a correct interpretation becomes very difficult.

Mishkin (1990)[1]) therefore noted that the yield curve is an exact measure of the market's inflation expectations only if the following

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1   Mishkin, F. S. "What does the Term Structure Tell Us About Future Inflation?", Journal of Monetary Economics, 25, pp.77–95, 1990.

conditions are met: (1) the real interest rate is assumed to remain unchanged over a certain period of time; (2) expectations are rationally founded; and (3) risk premiums also remain unchanged over that period of time. If one of these conditions is not satisfied, an analysis of the yield curve becomes a very complex affair and its validity as an inflation forecasting tool is impaired.[1])

Finally, even expectations regarding central bank moves have an impact on the yield curve. If market participants expect higher nominal economic growth, they may assume that the central bank will raise short-term interest rates in the future. This would immediately lead to higher long-term interest rates. As a result, the yield curve would become steeper in anticipation of higher economic growth and the central bank's assumed reaction.

Berk and Bergeijk (2000), in an ECB Working Paper[2]), conclude that yield curves should be used with great discretion to forecast future trends in inflation and output. Even if empirical evidence suggests that the term structure of interest rates is an effective indicator of future inflation and output – which the results of the study do not support – there would still be the problem of segregating the inflation-driven element of change in the yield curve from the output-driven component.

Confidence Indicators

The current phase of the business cycle and the economic outlook also provide indications of future inflation. The level of aggregate demand relative to potential output also exerts an influence on prices.

The monthly consumer confidence surveys conducted by the European Commission provide a good indicator of future economic activity.[3]) This confidence indicator comprises the responses to a total of five questions: two questions on the financial situation over the past and the next twelve months, two questions on the economic situation over the past and the next twelve months and one question on the private households' plans for spending on big-ticket items.[4])

Chart 5 shows that movements in consumer confidence follow developments in the real economy relatively closely. The consumer confidence indicator is closely correlated with real GDP and seems to have very little, if any, leading indicator property. Since, however, preliminary confidence data are released within the first two weeks of the end of the reporting month, i.e. much earlier than the national accounts data on sectoral growth or GDP data, they are still an important leading indicator of current economic activity.
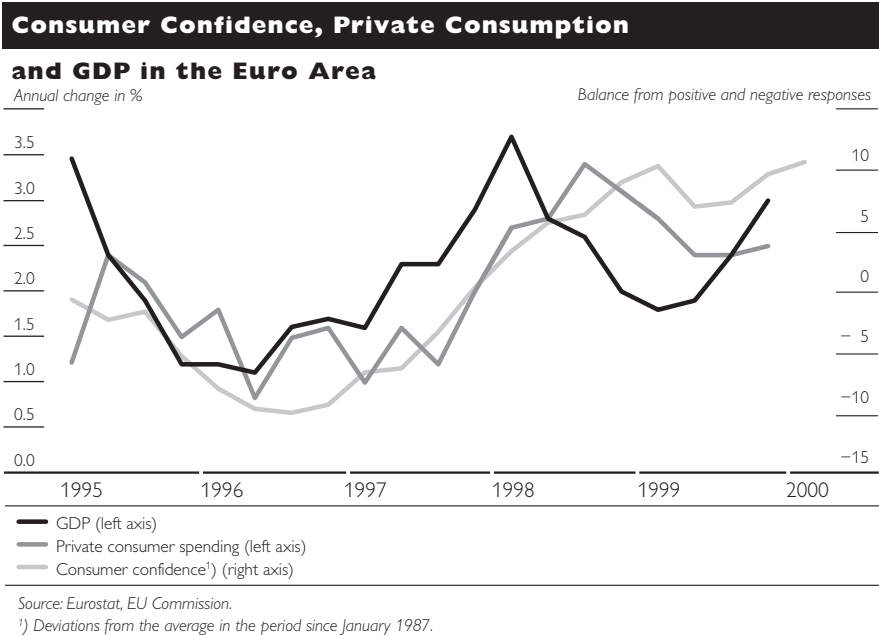
1   As the proper segregation of different effects is very difficult, breakeven inflation, obtained through an analysis of inflation index-linked bonds, is often used in analyzing the yield curve to filter out expected inflation.
2   Berk, J. M. and P. van Bergeijk. (2000). "Is the Yield Curve a Useful Information Variable for the Eurosystem?" In: Working Paper No. 11, European Central Bank.
3   The European Commission publishes the results of the surveys every month on its website: http://europa.eu.int/comm/economy_finance/document/eesuppb/firstresults.htm.
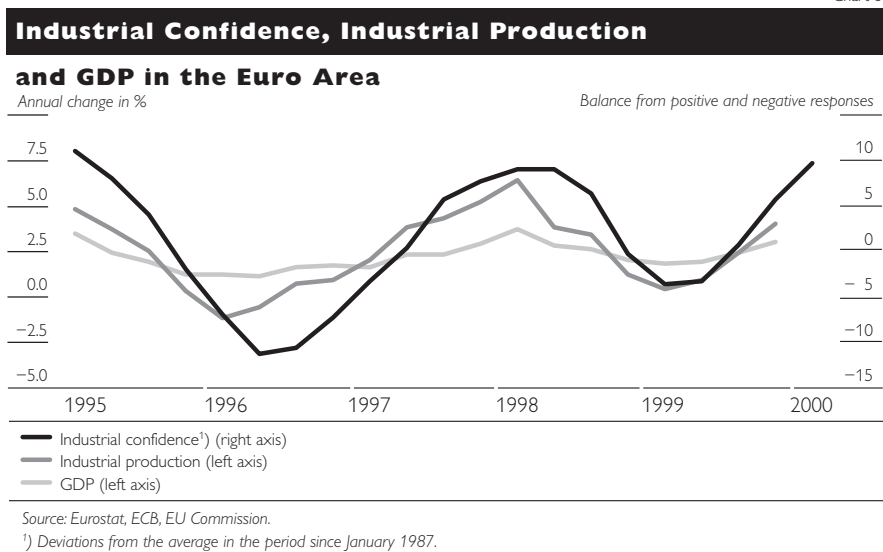4   See also Box 4 "Recent developments in industrial and consumer confidence in the euro area." In: ECB's Monthly Bulletin, October 1999.

Chart 5

Consumer Confidence, Private Consumption

and GDP in the Euro Area

Annual change in %

Balance from positive and negative responses

- GDP (left axis)
- Private consumer spending (left axis)
- Consumer confidence[1] (right axis)

Source: Eurostat, EU Commission.
[1] Deviations from the average in the period since January 1987.

Confidence indicators also provide valuable information about industrial production. About 50,000 enterprises in the EU are surveyed each month by the European Commission regarding recent production trends, orders booked, inventories of finished products, production expectations for the next months and expectations about changes in selling prices. The confidence indicator is defined as the arithmetic mean of the differences between the percentage shares of positive and negative responses to three questions relating to production expectations, the current orderbook and inventories of finished products.

Chart 6

Industrial Confidence, Industrial Production

and GDP in the Euro Area

Annual change in %

Balance from positive and negative responses

- Industrial confidence[1] (right axis)
- Industrial production (left axis)
- GDP (left axis)

Source: Eurostat, ECB, EU Commission.
[1] Deviations from the average in the period since January 1987.

As various studies, including studies commissioned by the European Commission[1]), have shown, industrial confidence, GDP growth, and industrial production are closely correlated. With this indicator, correlation is once again highest when coincident time series are used. The industrial confidence indicator also has hardly any leading qualities but is available at a much earlier date than production data. In its Monthly Bulletin of February 1999, the ECB moreover noted that an analysis of turning points in output suggests that the timing of any relationship with activity is variable.[2])

In addition to the confidence indicators that are compiled for the EU as a whole, industrial confidence is surveyed also at the national level. Ifo, a leading German economic research institute, for example, compiles separate industrial confidence indicators for eastern and western Germany and separate measures for the manufacturing industry and trade. The current confidence indicator is compared with a base year (1991) and is seasonally adjusted.[3])

Inflation Survey

The ECB conducts a quarterly *Survey of Professional Forecasters* in the euro area. This survey brings together the estimates of 83 experts regarding changes in the HICP over the next year and the next two years. Once annually, in February, a survey of inflation rates expected over the next five years is carried out. This survey may be regarded as a useful source of information supplementary to other survey-derived indicators of future price trends and the forecasts of leading international organizations (such as the IMF or the OECD).

Purchasing Managers Index (PMI)

Every month, managers in more than 1,500 manufacturing enterprises in Germany, France, Italy, Spain and Ireland are sampled regarding trends in their purchase prices.[4]) A geographical expansion of the survey is being planned. Even though the PMI does not yet cover all countries of the euro area, it may still be regarded as representative of the euro area. The five questions asked refer to current trends in new orders, output, employment, delivery times and inventories of purchased items. The managers are questioned whether trends are better (1), unchanged (0) or worse (–1) than in the previous month. The aggregate result therefore reflects a decline if the score is below 50 (100% of answers multiplied by 0.5). The data are seasonally adjusted (managers mention seasonal factors in their responses).

This index has been available only since mid-1997. The time series is therefore too short to provide a basis for econometric estimates. Its quality as a leading indicator is poor, as the questions address price trends in the

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1 "The use made of business and consumer survey results," European Economy No. 6, European Commission, 1997.

2 European Central Bank: "Recent developments in confidence indicators in the euro area," Monthly Bulletin, February 1999.

3 Ifo's business climate index can be accessed on the following website: www.ifo.de/orcl/dbssi/main.htm.

4 The PMI is released each month on the first business day.

current month. The indicator is basically complementary to the EU industrial confidence indicator.

Conclusion

As analysis of all indicators forming part of the second pillar of monetary policy strategy enables a broadly based assessment of the outlook for price changes and risks to price stability in general. The procedure applied is not a mechanistic one but takes into account the complex relations between individual indicators and price changes as well as those existing among the indicators themselves. Overall, an analysis of the two pillars provides a broad general picture that includes all the information that is needed for the monetary policy decisions of the Governing Council of the ECB.

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Estimate and Interpretation
of the Taylor Rule for the Euro Area

Friedrich Fritzer

I Introduction

Theoretically speaking, a central bank's monetary policy can be interpreted as the effort to solve a decision-making problem, as it attempts to stabilize the variability of the price level and the variability of economic growth within certain boundaries. However, as the operations of a central bank and the workings of the product, labor and financial markets are interdependent, the problem-solving process is far more complex than that involved in a purely technical optimization task.

Applying the Taylor rule to the monetary policy of the Eurosystem is, therefore, only an attempt to describe the past behavior of the Eurosystem.[1] This paper does not intend to provide a normative statement about the future direction of the Eurosystem's monetary policy. The introductory section discusses difficulties with the calculation and interpretation of a Taylor rule. Section 2 contains a general description of the Taylor rule. Section 3 comprises the empirical evidence for the Taylor rule in the euro area and discusses to what extent the monetary policy of the Eurosystem deviates from that of the EMS prior to January 1, 1999.[2] Section 4 concludes with a brief description of the usefulness of the Taylor rule for monetary policymaking.

The implementation of the Taylor rule entails a number of problems. First of all, the potential output growth (proxied by trend real GDP growth) of the economy has to be determined. Various methods of estimation have been proposed so far, with the results differing according to the method of calculation used. While the OECD and the IMF calculate potential output growth by estimating an output function, the European Commission uses a Hodrick-Prescott filter.[3] Estimation errors might be greater if, as is the case in the euro area, a number of country-specific data are aggregated.

The choice of the inflation index is also controversial. Both the HICP and a narrower index without volatile groups of goods are possible. The latter index can be used in particular if there are clear indications that seasonal variations and temporary shocks do not play a role in monetary policy decisions.

A significant drawback in the ex-post evaluation of the Taylor rule is the assumption that information is available in real time. Due to the time lag with which macroeconomic data and the subsequent revisions are published, such an evaluation cannot capture the real conditions.

Finally, it is problematic to assume that short-term equilibrium real rates remain constant. Neither the implicit calculation using the Taylor rule nor averaging over a longer period of time appear satisfactory. Apart from

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1   *Both at central banks as well as among central bank watchers, the Taylor rule has become increasingly popular over the past few years. See, for instance, Deutsche Bundesbank, Monthly Report April 1999, and Verdelhan (1998).*

2   *Empirical evidence suggests that the monetary policy of European countries prior to January 1, 1999, was influenced to a high degree by the monetary policy pursued by the Bundesbank. Clarida, Galí and Gertler (1998) point out that the estimates of reaction functions for France as well as Italy and the United Kingdom include the short-term interest rates in Germany as a significant determinant.*

3   *See De Masi (1997) and OECD Economic Outlook, December 1994.*

the yield on real capital, the degree of credibility of a central bank, among other things, determines the short-term equilibrium interest rate, but is adequately reflected neither in the Taylor rule nor in averaging.

2 The Taylor Rule

This monetary policy rule,[1] originally applied by John Taylor to the monetary policy of the Federal Reserve System (the "Fed"), holds that a central bank determines the short-term interest rate according to two goals: achieving long-term sustainable economic growth and maintaining price stability at the same time. The following reaction function for 1987 to 1992 gives a remarkably good description of the Fed's actual behavior:

$$(1) \qquad r_t = 2 + \pi_t + 0.5(\pi_t - 2) + 0.5(y_t - y^*)$$

with

r short-term nominal interest rate
π inflation rate (GDP deflator)
y real GDP growth
y^* potential output growth of GDP
t time index.

According to this monetary policy rule, the federal funds rate will increase by 0.5 percentage point if the inflation rate rises by 1 percentage point, or if real GDP climbs 1 percentage point. When both the inflation rate and economic growth reach the target value, the federal funds rate amounts to 4%, because Taylor assumes a 2% equilibrium real interest rate and an inflation target of 2%. Taylor calculated the potential output growth as the linear trend growth of real GDP from 1984 to the third quarter of 1992 at 2.2%. The goals of potential output growth and price stability were each weighted by the factor 0.5.

A monetary policy rule of this kind can also be applied to the euro area. Empirical evidence indeed suggests that the application of a modified Taylor rule delivers an adequate description of the monetary policy of the Eurosystem.

We assume that in each decision-making phase the Eurosystem aims at a short-term nominal interest rate r_t^* which depends both on the forecast inflation gap and the expected output gap.

$$(2) \qquad r_t^* = \bar{r} + \beta(E[\pi_{t+n}|\Omega_t] - \pi^*) + \gamma(E[(y_t - y_t^*)|\Omega_t])$$

with $\bar{r}$ denoting the short-term equilibrium nominal interest rate, $E[\pi_{t+n}|\Omega_t - \pi^*]$ denoting the inflation rate forecast by the central bank for $t+n$ using all information available at time t, and $E[(y_t - y_t^*)|\Omega_t]$ denoting the real GDP anticipated at time t. Expectations about the inflationary gap and the output gap are determined on the basis of information Ω_t available at time t. Lastly, π^* und y_t^* denote the inflation target and potential output growth respectively.

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1   *See Taylor (1993).*

A Taylor rule as in equation (2) is, however, too simple to portray actual monetary policy behavior adequately. Central banks do not fully control the development of the short-term interest rate, nor do they adjust key rates to new conditions in a single step, but rather gradually.

The dynamic pattern of adjusting the actual nominal interest rate to the desired one was approximated by the following process:

$$(3) \qquad \Delta r_t = (r_t^* - \delta r_{t-1}) + \rho \Delta r_{t-1}.$$

This means that the change of the nominal interest rate at time t corrects the difference between the nominal interest rate of the previous period and the currently desired nominal interest rate only partially (first term) and is, at the same time, characterized by persistence if δ is near 1 (second term). The Taylor rule (2) augmented by the partial adjustment term (3) yields the following monetary policy behavior rule:

$$(4) \qquad \begin{aligned} \Delta r_t = {}& \delta(\overline{rr} - (\beta - 1)\pi^*) + \delta\beta(E[\pi_{t+n}|\Omega_t]) + \\ & \delta\gamma(E[(y_t - y_t^*)|\Omega_t]) - \delta r_{t-1} + \rho \Delta r_{t-1} + v_t \end{aligned}$$

with $\overline{rr}$ denoting the short-term equilibrium real rate ($\overline{rr} = \overline{r} - \pi^*$) and v_t an exogenous error term.

The elimination of the expectation operator by attaching the estimation errors to the error term ε_t finally yields the modified Taylor rule (4) in the form of realized values:

$$(5) \quad \Delta r_t = \delta(\overline{rr} - (\beta - 1)\pi^*) + \delta\beta\pi_{t+n} + \delta\gamma(y_t - y_t^*) - \delta r_{t-1} + \rho \Delta r_{t-1} + \varepsilon_t$$

with the error term
$$\varepsilon_t = \delta\{\beta(\pi_{t+n} - E[\pi_{t+n}|\Omega_t]) + \gamma((y_t - y_t^*) - E[(y_t - y_t^*)|\Omega_t])\} + v_t$$
being a linear combination of the estimation errors for the inflation rate and the output gap as well as the exogenous error term v_t.

Estimating the parameter vector $[\beta, \gamma, \delta, \rho]$ requires an instrument variable estimator; here, the orthogonality conditions[1]) are used:

$$(6) \qquad \begin{aligned} E[\Delta r_t - {}&\delta(\overline{rr} - (\beta - 1)\pi^*) - \delta\beta\pi_{t+n} - \delta\gamma(y_t - y_t^*) - \\ & \delta r_{t-1} - \rho \Delta r_{t-1}|u_t] = 0. \end{aligned}$$

u_t is a vector of instruments which is known at the time of the monetary policy decision and is used for the inflation and output forecast, such as lags in the output gap and in inflation. If the number of instruments exceeds that of the parameters to be estimated, there will be restrictions of overidentification. These restrictions can be tested for their validity.[2])

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1   For a detailed description of the Generalized Methods of Moments see Clarida, Galí and Gertler (1998).
2   For example, with the Hansen test. See Clarida, Galí and Gertler (1998).

3 Empirical Evidence for the Taylor Rule

The time series used are monthly data of euro area aggregates covering the period from January 1990 to December 1999,[1] comprising the time prior to Stage Three of EMU until December 1998.

The phase of sharply falling interest rates that commenced in 1993 has two consequences for the econometric application of the Taylor rule. First, it is not possible to make any estimates of the Taylor rule using level values of the nominal interest rate, as they do not fulfill the precondition of remaining stationary throughout the entire period of observation. Secondly, the short-term equilibrium real interest rate cannot be calculated implicitly by means of the Taylor rule, as it would be overestimated due to its downward tendency. As an alternative, a plausible value for the short-term real interest rate is assumed and, subsequently, the robustness of the estimate results is examined by means of different real interest rates.

The following table contains the Generalized-Methods-of-Moments estimates of the parameters $[\beta, \gamma, \delta, \rho]$.[2]

Taylor Rule[1][2] for the Euro Area under Different Assumptions

about the Equilibrium Level of the Short-Term Real Interest Rate $\overline{rr}$

		Responsiveness to the		Responsiveness to the	
		inflation gap β	production gap γ	partial adjustment parameters δ	ρ
$\overline{rr} = 3.5$	Pre-EMU	1.65 (0.08)	0.53 (0.06)	−0.92 (0.01)	0.41 (0.20)
	EMU	1.80 (0.10)	0.45 (0.07)	−0.94 (0.02)	0.62 (0.19)
Wald Test (p-value)		0.15	0.24		
Hansen Test on overidentification of the restrictions: J = 8.80, χ^2(12) with p-value 0.72					
$\overline{rr} = 3.0$	Pre-EMU	1.50 (0.07)	0.49 (0.06)	−0.83 (0.01)	0.40 (0.18)
	EMU	1.63 (0.09)	0.42 (0.06)	−0.85 (0.01)	0.58 (0.17)
Wald Test (p-value)		0.15	0.25		
Hansen Test on overidentification of the restrictions: J = 8.73, χ^2(12) with p-value 0.73					
$\overline{rr} = 2.5$	Pre-EMU	1.35 (0.07)	0.46 (0.05)	−0.75 (0.01)	0.40 (0.15)
	EMU	1.47 (0.09)	0.39 (0.06)	−0.76 (0.01)	0.52 (0.16)
Wald Test (p-value)		0.15	0.28		
Hansen Test on overidentification of the restrictions: J = 8.46, χ^2(12) with p-value 0.75					

[1] Values in brackets are standard deviations.

[2] This estimate is the Taylor rule corresponding to equation 5, with the risk premium existing in the interest rate during the EMS crisis eliminated by means of a dummy (with the value 1 for October 1992 to September 1993 and 0 otherwise). The instruments used were the lags 1 to 6 as well as 9 and 12 of the HICP inflation rate and the output gap. The differences Δ refer to quarterly differences, i. e. $\Delta r_t = r_t - r_{t-3}$ for monthly data.

An extension of the estimate period from December 1998 (pre-EMU) to December 1999 (EMU) yields only slightly differing estimate results for the parameters of the Taylor rule. In fact, no evidence of a statistically significant difference can be found when applying Wald tests on the equality of the parameter estimate values.[3]

1   Sources: NEW CHRONOS database (Eurostat) for the nominal three-month interest rate and the Harmonized Consumer Price Index (HICP); OECD output gap data were interpolated. The data is available from the author (Friedrich.Fritzer@oenb.co.at) on request.

2   Detailed estimate results are available from the author (Friedrich.Fritzer@oenb.co.at) on request.
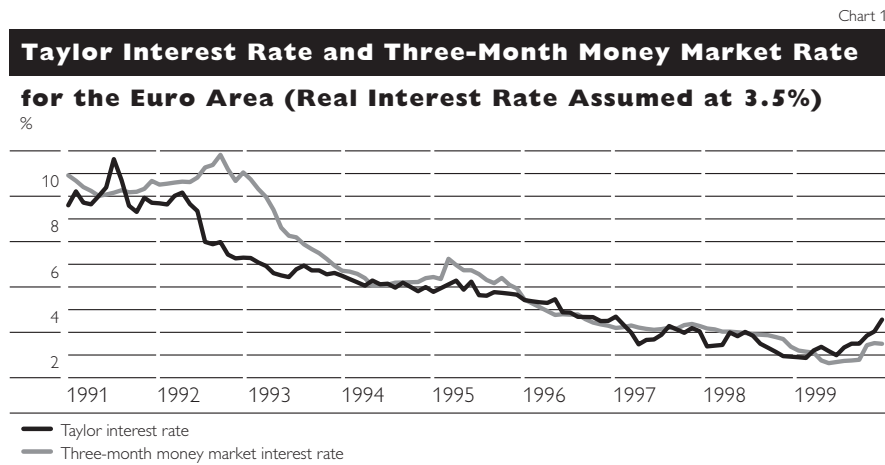
3   The parameter estimate values were examined by using the data material up to 1999:12 (EMU) to determine whether they are identical with those used during the observation period up to 1998:12 (pre-EMU) (null hypothesis). The null hypothesis could not be rejected in any of the three cases of different real interest rate assumptions.

The assumption of the equilibrium real interest rate level influences the conclusions in two respects: First, the parameter estimate value β (i.e. the reaction of monetary policy to an increase in the inflation rate with an unchanged production gap) changes, and second, the Taylor interest rates resulting from equation 5 are affected as well. The reaction to the production gap, however, remains largely unaffected by the assumption of the short-term real equilibrium rate.

The estimate results for the Taylor rule are robust vis-à-vis a change in the real interest rate by 50 basis points.[1] Only for a reduction of the short-term real equilibrium rate from 3.5 to 2.5% is the difference between the parameter estimates for the reaction to the inflation gap statistically significant.

Based on the assumption of a real equilibrium interest rate of 3.5%, the results indicate that – with inflation rising by 1% – the Eurosystem reacted by raising nominal interest rates by a total of about 180 basis points over this time period. With the inflation gap remaining stable but the production gap increasing by 1%, the monetary policy of the euro area is shown to have reacted by gradually raising the nominal interest rate by a total of 45 basis points.
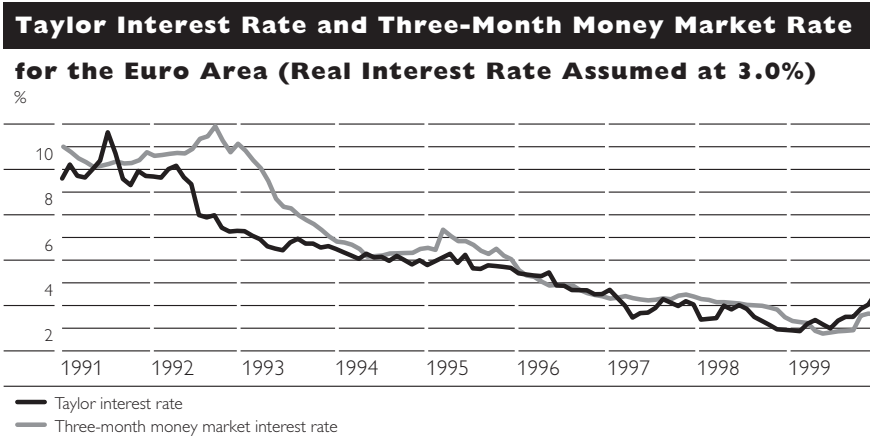
The adjustment of the Taylor interest rate assuming other real equilibrium interest rates is shown in the following charts.

Chart 1

Taylor Interest Rate and Three-Month Money Market Rate

for the Euro Area (Real Interest Rate Assumed at 3.5%)

- Taylor interest rate
- Three-month money market interest rate

The charts show that different assumptions on real interest rates do not change the trend of the Taylor interest rates but rather provoke a parallel shift. The lower the real interest rate, the lower is the Taylor interest rate. The Taylor interest rate is more closely aligned to the actual interest rate development over the period from 1991 to the end of 1998 at real equilibrium interest rate assumptions of 3.5 and 3.0% than at the low level of 2.5%, whereas after the transition to the Stage Three of EMU, the closest alignment is at a real interest rate level of 2.5%. A greater deviation of the

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1   *If the real interest rate is reduced from 3.5 to 3%, β is robust at the 5% level; if the real interest rate is reduced from 3.0 to 2.5%, β is robust at the 10% level.*

Chart 2

Taylor Interest Rate and Three-Month Money Market Rate

for the Euro Area (Real Interest Rate Assumed at 3.0%)

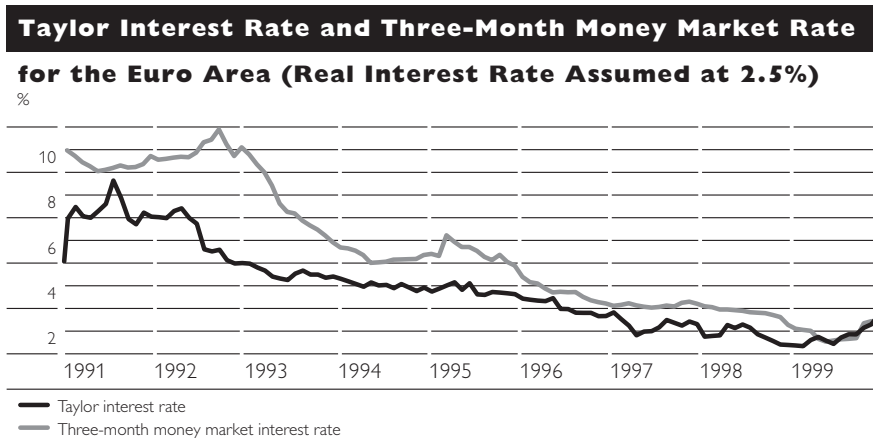—— Taylor interest rate
—— Three-month money market interest rate

actual three-month money market rate from the Taylor interest rate could be observed during the currency turmoil in 1992 and 1993.

Which equilibrium real interest rate is the right one? For the current equilibrium real interest rate only fluctuation bands can be given, for a number of reasons, notably because estimates over a historical period will only insufficiently reflect the effects of the price stability and fiscal consolidation progress made in the past few years. Both tendencies should have interest rate-reducing effects on the equilibrium real interest rate. The attempt to estimate the equilibrium real interest rate implicitly from the Taylor rule has the additional disadvantage that there are no precise estimates of the output gap, which affects the calculated equilibrium real interest rate. Attempts to use indexed securities to obtain an approximation are flawed by the fact that only France, but not the euro area, has a market for indexed securities; moreover, the market is only for long-term (10- to 30-year) indexed securities. Furthermore, these markets are characterized by low liquidity, which means that the securities carry both a risk and a liquidity premium. Thus, indexed bonds in the euro area are not really suitable to measure the short-term equilibrium real rate. In the fourth quarter of 1999, the real interest rate on indexed 10-year French bonds still amounted to 3.5% and increased to 3.9% in February 2000.

Chart 3

Taylor Interest Rate and Three-Month Money Market Rate

for the Euro Area (Real Interest Rate Assumed at 2.5%)

—— Taylor interest rate
—— Three-month money market interest rate

4 Conclusion

At present, the Taylor rule is no appropriate basis for monetary decisions both because its results are difficult to calculate and hence laden with considerable uncertainties, and because the normative interpretation of the results must be taken with a grain of salt. Conversely, it is certainly possible to use the Taylor rule to interpret the monetary policy pursued over historical periods. No sound empirical evidence could be found to confirm that the monetary policy of the Eurosystem deviates from previous monetary strategies. This has to be seen against the backdrop of the low volume of data that has become available since the implementation of Stage Three of EMU. The monetary strategy of the Eurosystem is based on a reference value for the monetary aggregate M3 and on current price developments as well as on the output gap plus a range of additional monetary, financial and real economic indicators which have an impact on the future development of inflation. Thus, the Taylor rule can serve as an aid in assessing monetary policy, but it cannot serve as the sole basis for monetary policy decisions.

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Modifications to the Monetary Policy Framework and Structural Changes in the Austrian Money Market in Stage Three of EMU

Michael Pfeiffer

Upon the transition to Stage Three of Economic and Monetary Union (EMU), a new operational framework for the implementation of monetary policy was put in place in the participating states. The new regime has had a considerable impact on developments in the national money markets. After all, it is not only the relative magnitudes that have changed: there has been a major restructuring as well.

Looking back on the year or more that has passed since the launch of the euro, the most significant changes shall be noted and assessed in this article.[1] Among other things, reference is made to modifications in the field of minimum reserve requirements, which are a cornerstone of the system that governs monetary policy operations.

1   Monetary Policy Framework

1.1 Open Market Operations

Unchanged from the OeNB's regime in the second stage of EMU, monetary policy transactions may be carried out in the form of *open market operations* or involve the use of *standing facilities.*

A key defining element of *open market operations* is that the initiative for such transactions lies with the European System of Central Banks (ESCB).

The main open market instrument of the ESCB are reverse transactions conducted with a weekly frequency and a maturity of two weeks (referred to as *main refinancing operations, MROs* for short). The transactions are executed in the form of standard tenders, which means that central bank funds are auctioned off to credit institutions according to a set procedure and in regular intervals.

While most of the successive steps of the auction are executed decentrally, i.e. through the national central banks (NCBs), it is the prerogative of the European Central Bank (ECB) to announce the terms and conditions of the transaction and to compile the national data and calculate the allotment amounts. For those calculations the ECB relies on the liquidity forecasts which the NCBs submit on a daily basis. Those forecasts indicate, among other things, how much liquidity is going to be absorbed or injected through so-called autonomous factors[2]).

The Oesterreichische Nationalbank (OeNB) introduced MRO-type transactions as early as 1996, gradually familiarizing the banking sector with a regular tender procedure and eventually establishing it as the main monetary policy instrument also in Austria. From among the different open market transactions conducted by the Eurosystem, MROs stand out as the instrument through which the bulk of refinancing is provided to the euro area financial sector on a regular basis.

In addition, the ECB also executes *longer-term refinancing operations (LTROs),* which are reverse transactions conducted with a monthly frequency and a maturity of three months. They account for a limited part of the global refinancing volume. In 1999 roughly 70% of the volume of liquidity

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provided in successive reverse transactions was alloted through weekly MROs and some 30% through monthly LTROs. Prior to January 1, 1999, the OeNB had offered no instrument equivalent to LTROs.

As laid down by the ECB, both types of reverse transactions may be executed either in the form of *repurchase agreements* or as *collateralized loans.* Given this choice, the OeNB discontinued its erstwhile practice of conducting repurchase agreements with an option to return the assets[1]) and adopted the collateralized-loan scheme for all its liquidity-providing transactions. The operational features – notably the so-called pooling system – tipped the scales in favor of collateralized loans: In pooling systems, the counterparty makes a pool of sufficient underlying assets available to the central bank to cover the related credits received from the central bank, thus implying that individual assets are not linked to specific credit operations. Repurchase agreements, by contrast, require an earmarking system where each credit operation is linked to specific identifiable assets. What is more, in pooling systems counterparties may easily substitute underlying assets on a daily basis (which provides more leeway to substitute other securities for assets required for another transaction).

Besides the two regular reverse operations, the Eurosystem's operational framework has been designed to include *other liquidity-providing or liquidity-absorbing instruments* for fine-tuning purposes or for structural operations. Such nonregular transactions may be conducted in the form of quick tenders (i.e. tender procedures with a shorter settlement frame and shorter maturity), as foreign exchange swaps, through the issuance of ECB debt certificates, through the collection of interest-bearing time deposits as well as through outright transactions.

This wide range of operations ensures that the ESCB is highly flexible in managing market liquidity and steering short-term money market rates.

1.2 Standing Facilities

Standing facilities differ from open market transactions inasmuch as the counterparty and not the central bank initiates the transaction.

In the Eurosystem, banks may access one liquidity-providing and one liquidity-absorbing facility, which under normal circumstances set the upper and lower limit for short-term money market rates.

The ceiling for the overnight market interest rate is provided by the liquidity-providing *marginal lending facility,* which counterparties can use to obtain overnight liquidity from their NCB against eligible assets. Apart from the requirement to present sufficient underlying assets, there is no limit on counterparties' access to the facility. A special feature of this facility is that it dovetails with counterparties' payment systems activities: Participants of the ARTIS system (Austrian Real-Time Interbank Settlement), the Austrian component of TARGET (Trans-European Automated Real-Time Gross settlement Express Transfer), which is the payment systems network that

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1   In a repurchase agreement with an option to return the assets the transferror must take the underlying asset off his balance sheet, while the transferee must include it in his balance sheet.

links the EU central banks with each other, may access *intraday credit* on the basis of underlying collateral. This measure is designed to smooth payment operations. Intraday credit must, as a rule, be adequately collateralized at the close of business. Should counterparties fail to provide full end-of-day collateralization, their intraday debit positions are *automatically* considered to be a request for recourse to the marginal lending facility.

The interest rate on the liquidity-absorbing facility, the *deposit facility,* provides a floor for the overnight market interest rate. This facility allows counterparties to deposit overnight surplus funds with the OeNB. There is no limit to the amount a counterparty may deposit under the facility, nor is there any collateralization.

Monetary Policy Instruments in Austria:

A Historical Comparison

Until 1996 the Austrian refinancing system was de facto based on standing facilities only. From 1996 to 1998 a hybrid system was used, with tender operations gaining more and more ground.

Every eligible counterparty was assigned a refinancing quota, whereby initially all refinancing quotas taken together roughly corresponded to the minimum reserve requirements of the Austrian banking sector as a whole.

At the time, the dominant type of transaction was repurchase agreements with an option to return the securities, known by the acronym GOMEX (short for Geldmarkt Offenmarkt Expansiv). No standardized maturity applied; the transactions were reversed solely on demand. Following the introduction of regular tender operations, the OeNB caused GOMEX transactions to lose ground by consistently holding the GOMEX rate above the tender rate.

Within the established refinancing ceilings, banks were also free to fund themselves by discounting trade bills, subject to certain provisions.

In addition, counterparties had access to a lombard facility, through which they could meet overnight liquidity shortfalls. Because the lombard rate was even higher than the GOMEX rate, the lombard facility was virtually never accessed in practice. The new marginal refinancing facility is the Eurosystem's exact equivalent of the OeNB's lombard facility; by contrast, no direct successor instruments were put in place for either Austria's GOMEX facility or its discount facility.

To drain excess liquidity, the OeNB offered a liquidity-absorbing instrument executed in the form of open market operations, known by the acronym REGOM (short for Restriktive Geldmarkt-Offenmarktgeschäfte).

This facility – which was hardly ever used either – gave banks the possibility to deposit funds with the OeNB by purchasing debt securities issued by the OeNB. These transactions, which had the legal nature of repurchase transactions with an option to return the securities, could also be reversed on demand.

The Eurosystem's equivalent of the OeNB's liquidity-absorbing REGOM transactions is the deposit facility. The only difference is that the central bank no longer issues debt certificates to be used as collateral in the transaction.

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Article 19.1 of the ESCB/ECB Statute stipulates that the Eurosystem's refinancing facilities may principally be *accessed* by all credit institutions subject to minimum reserve requirements. In practice, counterparties must meet some operational conditions to participate in the Eurosystem's monetary policy operations, and they must also be financially stable and subject to harmonized supervision.

Following the restructuring of the operational framework, the sum total of *potential counterparties* to the OeNB's monetary policy transactions has *expanded* considerably, namely from some 60 under the old regime to currently roughly 900. In practice, though, given the operational conditions for participating in operations and the larger market, the new provisions have reduced the number of counterparties that have actually been admitted to refinancing operations to just below 50 at present.

Participation in the *fine-tuning* operations is limited to an even smaller number of counterparties, since such transactions call for efficient – and speedy – settlement, and the counterparties have to have a certain size.

1.3 Eligible Assets

EMU has also brought a number of changes in the field of *eligible assets.*

Eurosystem credit operations must invariably be based on *adequate collateral* provided by the counterparties. Collateral will be deemed adequate if it is included in either of the two lists of eligible assets – tier-one and tier-two assets – which are principally equally eligible for all refinancing operations:[1])

The so-called *tier-one assets* are marketable debt instruments denominated in euros, which must be issued (or guaranteed) by entities established in the European Economic Area (EEA) and which must be located in the euro area. To qualify for inclusion in the tier-one list, such instruments must, moreover, meet high credit standards. The credit standard of debt instruments may be assessed on whether specific EU directives[2]) are fulfilled, or ratings by international rating agencies may be taken into account. Special provisions apply for debt instruments issued by credit institutions, which – unless they have special security features such as are built into mortgage bonds or securitized bonds – are de facto accepted in tier one only if an issue has been awarded a prime issuance rating.

Tier-one assets issued on the Austrian securities market comprise *debt instruments issued and guaranteed by the federal government (with the exception of instruments issued by banks) and state government bonds as well as mortgage-backed bonds, municipal bonds and securitized bank bonds; they are automatically accorded tier-one status.* In the case of defaults a joint liability by the members of the ESCB kicks in.

Tier-two assets are additional assets which are particular to the national capital markets and the national banking systems of the participating states. The standards they must meet are as stringent as those which apply for

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1   The ESCB does not normally use tier-two assets in outright transactions.

2   *Specified in ECB: The single monetary policy in Stage Three – General documentation on ESCB monetary policy instruments and procedures, pp. 40 and 41.*

tier-one assets. Since the eligibility criteria for the tier-two assets may be established by the individual NCBs – subject to approval by the ECB – liability is also confined to national boundaries.

The tier-two list is open to marketable and nonmarketable debt instruments traded euro area-wide and equities traded on a regulated market according to the Investment Services Directive[1]). Regarding currency and deposition of the securities, the same provisions apply as for tier-one assets, except for the fact that the papers must be issued by entities established in the euro area (i.e. not the wider EEA).

Under this category, the OeNB has, so far, accepted *bills of exchange, bank loans and bonds* as eligible collateral. Bank loans are a new addition to the list of eligible assets in Austria, which may explain why their utilization has been rather moderate. By contrast, bills of exchange have lost attractiveness given the operational conditions and the high handling cost, which is why utilization was extremely low. The OeNB, therefore, decided to remove *bills of exchange from the Austrian tier-two list altogether from June 30, 2000.*

Generally, the option of using nonmarketable tier-two assets such as bank loans has expanded banks' refinancing basis and, hence, their possibilities to optimize the return on their investments, e.g. in the case of funds they lock up in liquid government bonds (for instance through engaging in securities lending activities). The secured money market segment needs to become more efficient, though, to enable counterparties to fully reap the benefit of the wider refinancing basis.

To conclude the section on eligible collateral, *valuating* collateral has gained tremendously in significance, since valuation is an integral part of the *risk control* measures which the ESCB applies. Collateral is revalued on a daily basis (marking-to-market principle). In this respect, individual debt instruments are subject to specific *valuation haircuts,* which means that a certain percentage is deducted from the market value of the underlying asset. The haircuts are differentiated according to the residual maturity (for fixed-income securities they may be as high as 5%).

In addition, the ESCB applies so-called *initial margins.* Depending on the exposure time for the Eurosystem, this margin is set at either 1% or 2%, which means that the collateral required for a transaction is equal to the credit extended to the counterparty plus the value of the initial margin.

1.4 Minimum Reserves

While some specifications of the current minimum reserve system are similar to those under the former Austrian scheme, there are notable differences, as described below.

Until the end of 1998, the minimum reserve ratios were set as follows in Austria: at 5% for sight deposits, at 3% for all other deposit categories, and likewise at 3% for banks' direct issues with a maturity of up to two years. Furthermore, only schilling liabilities of residents were subject to

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1   Directive 93/22/EEC, Council Directive of 10 May 1993 on investment services in the securities field, OJ L 141 of 11 June 1993, p. 27ff.

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minimum reserves. For Austrian banks the regime change meant that more than ATS 10 billion previously tied up were released as of January 1, 1999 – despite the fact that the Eurosystem's reserve requirement also applies to foreign currencies – because the Eurosystem applies a lower reserve ratio (namely 2% for deposits and banks' direct offerings issued with an agreed maturity or a period of notice of up to two years).

A lump-sum allowance (EUR 100,000) deductible from the reserves which a credit institution is required to hold eases compliance for small banks.

Another improvement for Austrian banks results from the fact that, since the introduction of the euro, the required reserve holdings have been remunerated at the level of the average interest rate of the main refinancing operations conducted over the maintenance period; before, minimum reserve holdings had not been remunerated.

Finally, for operational reasons the successive maintenance periods do not end on the last day of the month, as used to be case under the OeNB's regime. The maintenance period runs from the 24th calendar day of one calendar month to the 23rd of the next.

Throughout the euro area, the new minimum reserve system creates a structural liquidity deficit of the banking sector of about EUR 110 billion, which is indeed a solid basis for the implementation of operational targets for steering short-term money market rates. The fact that the requirement must be met on average during every maintenance period has a stabilizing effect on money market rates, thus supporting the ESCB's philosophy of striving to minimize the number of fine-tuning operations.

Another modification to the monetary policy framework of relevance to liquidity policy is the reorganization of liquidity forecasts. Since the launch of the euro a markedly higher number of so-called autonomous factors (such as banknotes in circulation) are to be recorded and reported to the ECB on a daily basis during the duration of each reserve maintenance period. Thus, the national forecasts are no longer of national interest alone; much rather, the ECB relies on them to fashion the global perspective it needs for managing liquidity throughout the euro area. What is more, the individual central banks have embarked on a quality competition of sorts, since the ECB regularly reviews deviations on the basis of which it establishes a performance ranking of the participating NCBs.

2 First Experiences with the New Operational Framework and the Changed Conditions on the Money Market

2.1 Tender Operations

Generally it can be said that the Austrian banks have *coped well* with the dual system of main refinancing operations (MROs) and longer-term refinancing operations (LTROs). The domestic counterparties took in their stride particularly the main refinancing operations conducted as *fixed-rate tenders[1]),* which clearly signal the stance of monetary policy.

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1   *In a fixed-rate tender, the ECB specifies the interest rate in advance and participating counterparties bid the amount of money they want to transact at the fixed interest rate.*

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What stands Austrian banks in good stead is the fact their holdings of *collateral* are sufficient to allow them to hold their own in the bidding competition, which above all in times of imminent interest rate increases depresses allotment ratios to below 2%.

A number of domestic banks have started to use the new option permitting them to postpone the provision of collateral until the settlement date (delivery versus payment) rather than having to deposit securities on a safe custody account before they may engage in a tender operation; this has instigated a behavior that is "closer to the market."

However, for the most part counterparties have continued to collateralize predeposited assets – i.e. assets they had deposited in advance on the OeNB's safe custody account with the Oesterreichische Kontrollbank, as was mandatory before the third stage of EMU.

Most certainly this can be explained by the fact that repurchase agreements and securities lending continue to play a minor role in Austria, so that the opportunity cost of tying up eligible collateral continues to be comparatively small.

Turning to the *number* of institutions that are active in the regular refinaning operations – compared with the number of banks refinancing themselves at the OeNB in Stage Two – and to the types of tender operations, the following assessment can be made.

Since the euro was launched, the monthly LTROs have been executed in the form of a variable-rate tender[1]), whereas all weekly MROs were conducted in the form of a fixed-rate tender from January 1999 to June 2000. With longer-term transactions, the ESCB does, as a rule, not intend to guide market interest rates but wishes to be the rate-taker, so as not to send any divergent signals to the market. Starting with the MRO settled on June 28, 2000, the Eurosystem switched to the variable-rate tender also in its main refinancing operations. This move came in response to the severe overbidding which had developed in the context of the initial fixed-rate tender procedure.

Turning to the number of institutions that are actually active in refinancing operations, *no extreme changes* have surfaced notwithstanding the regime change: On average, about 20 to 30 counterparties have been refinancing themselves at the OeNB throughout the past few years.

Interestingly, though, the number of banks using MROs differed from the number of banks using LTROs, obviously for reasons linked with the operational differences between the two tender procedures: The number of active counterparties in the monthly LTROs tended to be lower than for the weekly MROs – on average by a group of 5 to 10 banks. To avert potential risks, a few counterparties obviously preferred the simpler instrument of a fixed-rate tender to the somewhat more complex instrument of variable-rate tenders.

There are also differences when it comes to *size* and *bidding behavior.* Evidently comparatively fewer small banks participated in the variable-rate

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1   *In a variable-rate tender, counterparties bid the amounts of money and the interest rates at which they want to enter into transactions with the national central banks.*

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procedure than in fixed-rate tenders. Generally, small banks displayed the same market behavior as the big market participants, i.e. usually they did not submit bids that were a far shot from the market average.

The *allotment policy* of the ECB can generally be interpreted thus that the ECB aims to compensate existing tendencies to overbid by alloting funds generously. This tendency can be observed above all with tender operations that straddle the final day of the minimum reserve periods.

2.2 Standing Facilities

At the start of Stage Three of EMU the ECB set the initial interest rates on the standing facilities in such a way that they formed a rather narrow corridor for the movements of the overnight market interest rate, with the deposit facility providing a floor and the marginal refinancing facility providing a ceiling. As a transitory measure this corridor was kept at a width of 0.5% during the first three weeks of January 1999. This was to ensure that liquidity management misjudgments on the part of the banks or of the Eurosystem would not be penalized too severely in the early phase of transition. Likewise, the narrow corridor was to prevent money market rates from becoming too volatile in this phase. Intense recourse to the two facilities in the euro area in the initial days confirm that the ECB took the right action.

Recourse to Standing Facilities/Euro Area Total

EUR million

Source: ECB.
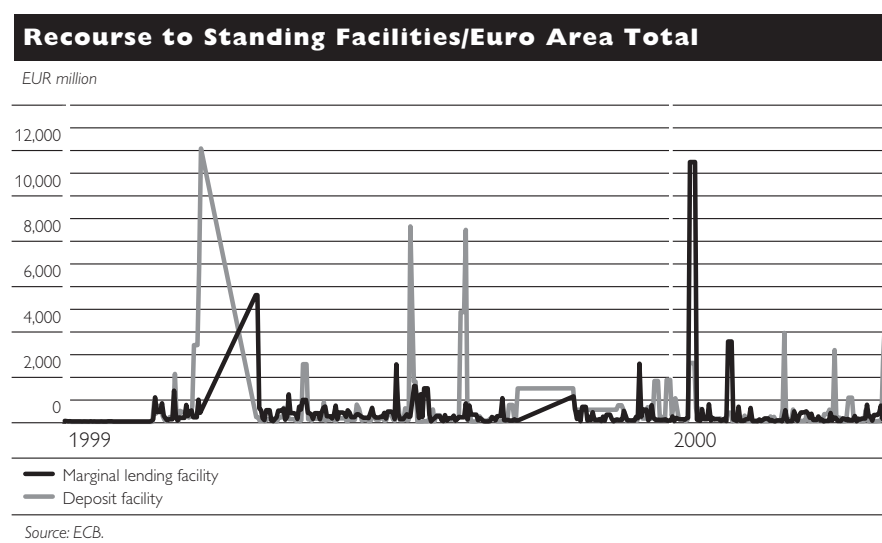
Subsequently this corridor was extended to the "normal" initial width established beforehand: The interest rate on the deposit facility was lowered to 2% and the interest rate on the marginal lending facility raised to 4.5%. Thereafter, recourse to the two standing facilities diminished markedly, although particularly on the last days of maintenance periods recourse, above all to the deposit facility, was still fairly high. This implies that considerable progress has been made in integrating the European money market, but that there is still some potential for enhancing market efficiency.
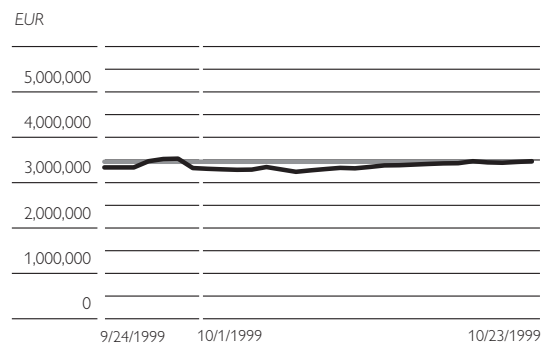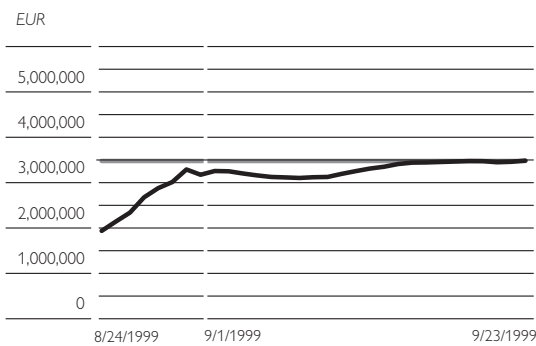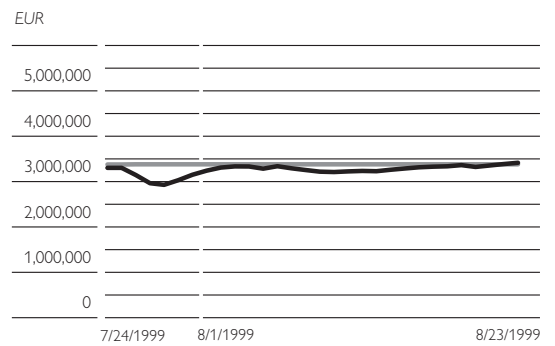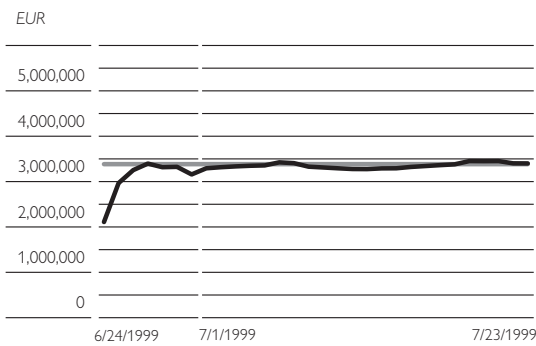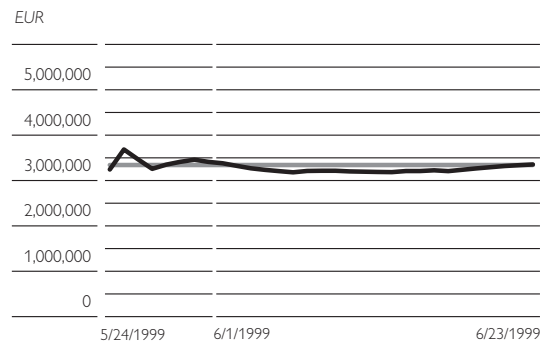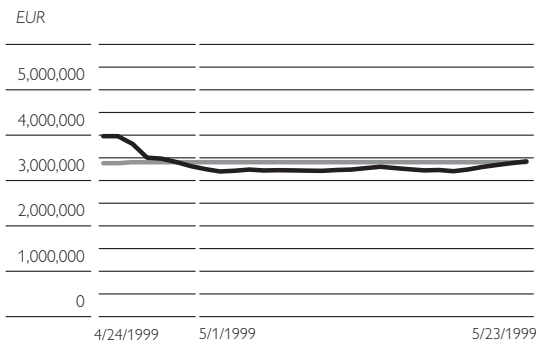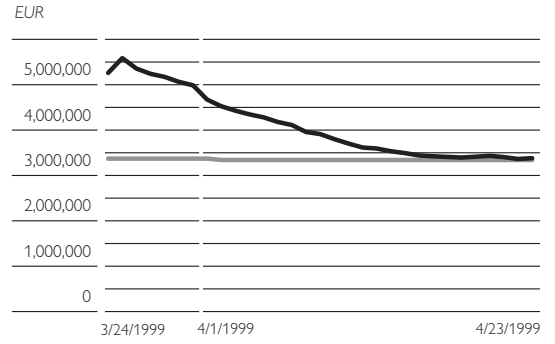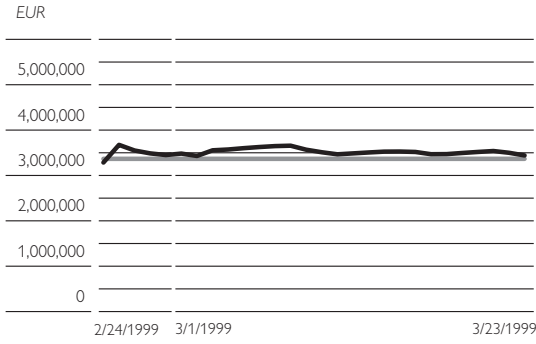
2.3 Fine-Tuning

It is the explicit goal of the Eurosystem to rely exclusively on the *regular refinancing operations* for its liquidity management. Looking back, one can say that the Eurosystem has been so consistent and successful in its allotment policy that, almost one and a half years after the establishment of the euro area, *only a single* fine-tuning operation had been carried out, namely at the beginning of the year 2000. At the time, the Eurosystem collected *fixed-term deposits* through a variable-rate American-auction quick tender for which it had set a maximum interest rate of 3% and a maturity of one week, from January 5 to January 12. The purpose of the transaction was to withdraw the excess liquidity accumulated amidst Y2K preparations, particularly through the last main refinancing operation that straddled the end of 1999. The measure aimed at restoring normal liquidity conditions in the money market after the successful transition to the year 2000.

2.4 Minimum Reserves Management

Domestic institutions in general find it harder today to interpret changes in current account holdings – which the ECB publishes on a daily basis – and, consequently, minimum reserve maintenance patterns in the euro area as a whole. For their own liquidity management this means that it is has become more difficult to plan ahead: as the underlying development of the autonomous factors is as yet not transparent enough, Austrian banks cannot infer how much the ECB is going to allot in the forthcoming tenders. The reserve maintenance patterns must also be seen from this point of view.

Minimum Reserve Maintenance and Required Reserves

EUR

5,000,000	
4,000,000	
3,000,000	
2,000,000	
1,000,000	
0	

2/24/1999   3/1/1999   3/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

3/24/1999   4/1/1999   4/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

4/24/1999   5/1/1999   5/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

5/24/1999   6/1/1999   6/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

6/24/1999   7/1/1999   7/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

7/24/1999   8/1/1999   8/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

8/24/1999   9/1/1999   9/23/1999

EUR

5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0

9/24/1999   10/1/1999   10/23/1999

—— Average reserve maintenance
—— Required reserves

Source: OeNB.

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Minimum Reserve Maintenance and Required Reserves (cont.)

Average reserve maintenance
Required reserves
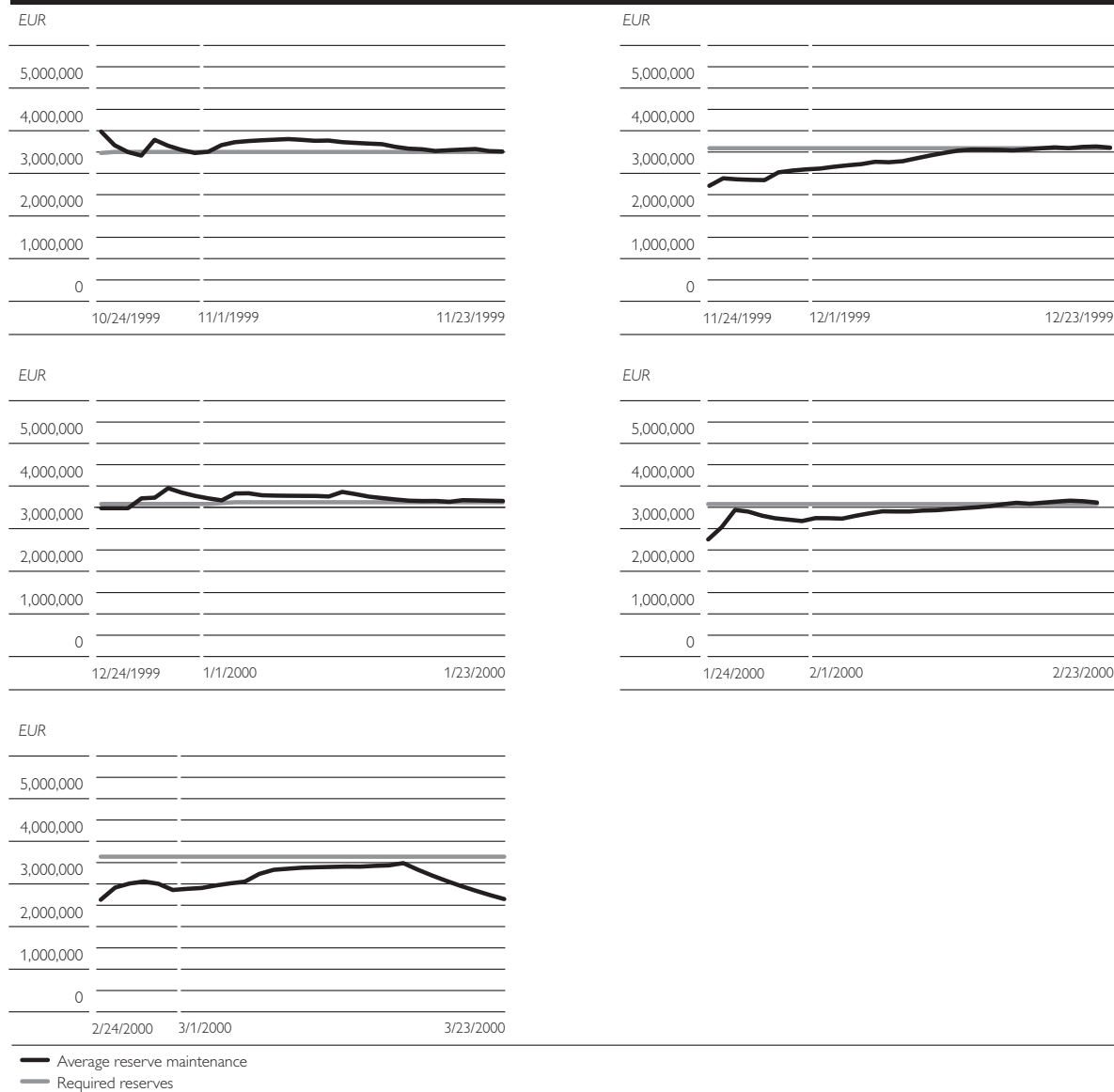
Source: OeNB.

These charts show that in the first months of the system's existence – with the exception of the very first maintenance period, which was also longer than the other periods – Austrian banks tended to *frontload,* e.g. hold higher average reserve balances at the beginning of each maintenance period. As time progressed, confidence in the allotment policy of the ECB apparently grew, especially the confidence that the ECB was going to supply liquidity generously in the final days of a maintenance period. In other words, in most months since mid-last year, banks have rather tended to backload, e.g. lag behind somewhat in filling up their minimum reserve accounts. Exceptions are probably due to market expectations of imminent increases in interest rates and special factors, such as the ample liquidity prevailing at the beginning of the year 2000.

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2.5 General Market Observations

It is a fact that the *money markets* of the 11 EU countries *melted into one very quickly,* in any case as far as lending in the *unsecured segment* is concerned. On the one hand this can be deduced from the fact that the interest rates applied by the panel banks contributing to the calculation of *EONIA* (Euro OverNight Index Average) lay within a rather narrow band; there were only minor deviations from one market to the other. One striking feature is that – compared with the situation on the Austrian market before January 1, 1999 – short-term rates have generally become more volatile toward the end of the maintenance periods. Nevertheless, the average differential of EONIA from the corresponding MRO rate was as low as roughly 3 basis points in 1999. For the ESCB's liquidity policy this would imply that the overnight interest rate has de facto asserted itself as the operational target.

In other words, throughout most observation days a generous allotment of liquidity by the ECB delivered EONIA rates within relatively close range of the main refinancing rate of the Eurosystem.

EONIA and Official Rates

Source: ECB.
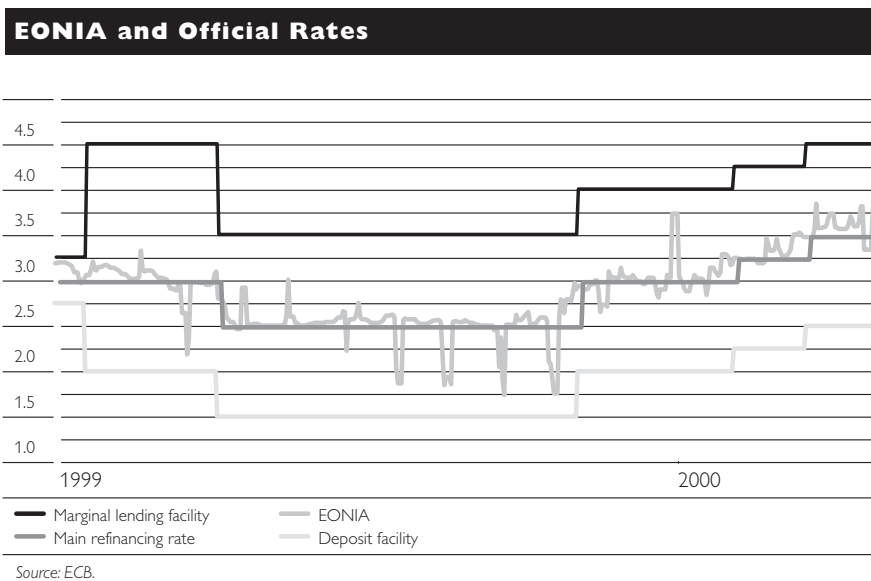
The impact of the regime change on the Austrian money market can be summarized as follows:

Liquidity distribution problems that on occasion occurred under the old system and which resulted from the oligopolistic structures of the Austrian money market *are now a thing of the past.* Above all, national tax deadlines and the like, which used to be critical moments for liquidity supply, have lost their sting.

The transition to Stage Three of EMU no doubt went hand in hand with a certain *internationalization* of national money markets; prior to the introduction of the euro there been a concentration on local financial centers. Heterogeneous liquidity conditions in the various member countries combined with global refinancing allocation have reinforced the internationalization tendencies. The *TARGET system,* which has on the whole been functioning very efficiently, was probably instrumental in shaping this

development. Furthermore, the immediate acceptance of EONIA and EURIBOR (Euro Interbank Offered Rate) as substitutes for the national money market reference rates has had a positive impact. Given the integration of the money market, payment flows in other euro area countries now have a much stronger influence on the liquidity situation in Austria than used to be the case.

The developments sketched above, together with *increased market liquidity and increased competition* have apparently led to greater *tiering in the interbank market*. Major international banks appear to be trading first and foremost among each other or with small banks operating locally. But even the smaller banks are likely to borrow or lend increasingly cross-border, although their cross-border business is mostly focused on institutions of their own size.

Settlement size is apparently tending to rise from that prevailing for single transactions in the past, which is causing the overall number of money market deals to sink.

The Austrian market for *secured products,* above all domestic products, appears to have seen less sweeping changes after the transition to the euro. This implies that there is still no liquid market for short-term money market paper, such as certificates of deposit or commercial paper, and that there is still no real repo or securities lending market based on Austrian paper. The latter is possibly linked to the lack of supply of Austrian securities for eurobond futures.

Hence the *integration of the secured money market segment of the euro area has obviously progressed far less* than the integration of the market for unsecured transactions. One reason may be the institutional environment – there are no uniform clearing and settlement structures for secured cross-border transactions.

3   Concluding Remarks

To sum it up, the Austrian banks have successfully coped with the operational framework of the Eurosystem that was put in place on January 1, 1999, last but not least because the OeNB started to adapt domestic structures to the expected new regime already during the runup to the launch of the euro.

The money market has shown a marked degree of integration for unsecured transactions, but this has yet to be matched in secured money market activity, not only in the Austrian market. Progress in establishing heterogeneous structures in the euro area so far, however, indicate that the national markets are going to melt into a single efficient market comparatively soon.

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Enquiries at credit institutions that participate in monetary policy operations

Studies

Venture Capital in Austria

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Gudrun Mauerhofer

1 Introduction

An efficient risk capital market serves as an important source of financing for startups. Venture capital is a specific form of startup and early-stage expansion financing. In the U.S.A., this form of financing has a long tradition, whereas in Europe venture capital financing started to gain importance only in the past decade. Recently, this market has been growing dynamically in Austria as well. This study examines the framework conditions of the Austrian venture capital market.

Section 2 highlights the specific financing problems that newly founded companies tend to encounter. Section 3 elucidates and analyzes the purpose and functioning of venture capital and illustrates to what extent venture capital is a solution to the financing problems companies encounter in the early stages of their growth cycles. Section 4 focuses on the conditions the venture capital market requires for development.

2 The Financing Problems of Startups

As part of the financial growth cycle (Berger and Udell, 1998) of enterprises, the financing of startups has its own difficulties and problems. Substantiated and reliable information on the development and perspectives of newly established enterprises is generally hard to obtain and difficult to evaluate. Startups have no track record of past development and performance. Especially in the case of highly innovative companies, the prospects of success are difficult to assess and require special expertise in the relevant area of business. Usually, managers and insiders are much better informed about a specific project's or enterprise's chances of success than outside investors.

The huge discrepancy in the information available to suppliers of capital and that available to entrepreneurs makes the problem of adverse selection a serious impediment in obtaining debt financing for startups. Even interest rates frequently prove inadequate as a risk parameter. If banks, endeavoring to hedge uncertainty-related risks, take recourse to higher interest rates, they might find themselves confronted with high-risk projects only, which in turn may even prompt them to discontinue their financing operations (Stiglitz and Weiss, 1981). Hence, banks often consider young companies costly and risky debtors, facts that frequently cause credit negotiations to fail.[1])

Establishing long-term financial relationships between lenders and borrowers may help reduce this asymmetrical distribution of information (Diamond, 1984). Regular contacts, reports and other flows of information may considerably reduce the cost of procuring information for the lender and at the same time constitute a unique source of information about the situation of a company and its development. This type of special expertise compiled by collecting relevant information material represents an important competitive advantage for financial intermediaries. At the same time, the implicit link thus forged between creditors and debtors facilitates

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[1] Moreover, banks look at a company's equity capital base before doling out loans. Debt financing is therefore contingent on equity.

reaching an agreement on services which cannot be contractually agreed on beforehand. Close and frequent contacts between lenders and borrowers may even help reduce moral hazard perceptibly.

Irregular, highly fluctuating revenue flows, which are typical of the early stages of a business, imply the increased risk that an enterprise might not be able to service its debts. Under the credit agreement, the lender has clearly defined claims against the debtor (regular interest payments, repayment of principal) and does not participate in any additional earnings the company may generate due to the high risk it is willing to incur, as such risk could, in fact, jeopardize regular debt service. Shareholders, by contrast, have a vested interest in high returns, in which they participate to an unlimited extent, while the risk they take is limited to the investment they make. At first glance, the prospect of quickly achieved high returns seems to promise unhampered debt service. However, the risk profile of lenders and equity financiers differs in line with their specific interests; therefore, debt financing of startups is frequently foiled by the high risk involved.[1])

Often, it takes several years until a newly founded enterprise attains a net income. During the initial stage, any surplus income is reinvested into the project to finance the company's expansion and consequently does not become available to service loans. In order to reduce their risk, lenders therefore demand collateral in the form of material, preferably fungible, assets to secure the loan. However, startups frequently lack the collateral to secure a loan. Access to debt financing also depends on the size of the enterprise: Small companies are generally less diversified (markets, products) than larger ones. Hence, their revenue flows are more volatile, which is why the credit risk involved is assessed to be higher.

As uncertainties and the asymmetrical supply of information frequently hamper access to debt financing for young enterprises, they have to cover their need for external funds by raising equity capital. Access to the stock market is usually barred because providers of funds lack information about the companies and their financing needs. The legal form of a joint stock company involves standards that are difficult to meet for small and young companies. Stock corporation law is tailored to the requirements of large enterprises with substantial free float and, by comparison to other legal forms, joint stock companies are characterized by being highly regulated (Deutsche Bundesbank, 1997; Dorn, 1999). Moreover, the establishment of a joint stock company or an existing company's transformation into this legal form requires a number of adjustments in company's decision-making processes. What is more, family enterprises frequently shy away from the influence of third parties that a change in the legal form would imply. Going public invariably requires increased transparency, because access to equity capital always implies the obligation to furnish information and to observe stringent disclosure requirements. Additionally, restrictions imposed by

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1   The situation is quite different if high returns are not only anticipated, but have already been achieved. In this case, the company will find it easier to service its debts; at the same time, the shareholders' risk situation changes: Their incentive to invest in risky projects decreases as soon as a credit agreement has been concluded because they put more at stake to secure their participation in high earnings.

securities and exchange law, such as a minimum period of existence or minimum issuing volume, may also impede access to funding through a stock exchange (Kaufmann, 1997).[1])

Only 191 (or 0.18%) of a total of 105,000 newly founded companies in Austria in the period from 1993 to 1998 were joint stock companies. Data providing insight into the balance sheets of young enterprises in Austria are difficult to obtain. Balance sheet indicators of Austrian manufacturing and construction companies compiled by the OeNB[2]) reflect only a small share of young companies, because the figure for new businesses also includes subsidiaries of existing companies, pure project development companies, spinoffs and the like. Moreover, this figure represents only companies a bank has rated as financially sound debtors, i.e. companies that have actually received credits. Hence, these data fail to show the impact of a company's age on improving or barring the company's access to bank loans. In fact, broken down by age group, the ratio of liabilities to banks to total assets differs only slightly for the different age groups.

Balance Sheet Indicators of Austrian Manufacturing and Construction Enterprises by Age Group from 1994 to 1998

	Age of the company		
	5 years and over	3 to 5 years	1 to 2 years
	% of the balance sheet total		
Equity capital[1])	28.1	24.7	32.4
Risk capital[2])	39.0	37.3	39.8
Liabilities to banks	23.5	22.3	24.8
Indebtedness[3])	12.0	14.0	12.3
Sample size[4])	6,490	398	67

Source: OeNB,
[1]) Nominal capital + capital and revenue reserves + untaxed rreserves +/− other liabilities of equity nature.
[2]) Equity capital + provision for severeance pay and pensions + relief fund + long-term provisions.
[3]) Bills payable, trade accounts payable.
[4]) Number.

In order to eliminate the high volatility of the indicators due to the low sample size and to obtain a larger sample, the calculations were based on the average of the past five years (1994 to 1998). The calculations showed that in the period of observation, the average equity ratio of young enterprises (one to two years of age) was lower than that of companies aged five years or more. Notwithstanding all qualifications that the interpretation of these figures require, the result may be taken as an indicator that young

1   *By international comparison, the Austrian stock market exhibited a rather unfavorable price trend; to some extent, this may also explain enterprises' reluctance to adopt the legal form of a joint stock company. Deutsche Bundesbank (1997) also highlighted this argument in explaining the low issuing activity in Germany during the 1980s; at the same time, it points out the correlation observed between rising stock prices on the German stock exchange and increased share issuance during the 1990s.*

2   *Basically, these data consist of the annual accounts of companies whose bills of exchange were filed for discounting with the OeNB as well as, since 1999, companies whose bills were pledged with the OeNB or whose liabilities to banks were assigned to the OeNB. Moreover, a number of companies which no longer take part in refinancing operations continue to send their balance sheet data to the OeNB.*

enterprises in Austria are likely to encounter obstacles in gaining access to equity capital.

Therefore, small and young enterprises would benefit considerably from forms of financing that come both with a long-term commitment on the part of equity providers and guidance as to the specific challenges a particular company is facing in its market. In many instances, venture capitalists are the most suitable agents to assume this task.

3 Functions of Venture Capital

The capability to bear a risk is a central property of equity capital. Therefore, equity capital is always risk capital. In U.S. terminology, equity capital raised through channels other than a stock exchange is termed private capital or private equity. Even though the terms venture capital and private capital or private equity are frequently used as synonyms, not every type of equity financing raised through channels other than the stock exchange is venture capital. In the stricter sense, venture capital is a form of financing specifically tailored to the needs of startups and early-stage enterprises. Venture capitalists take an equity stake in an unlisted company for a defined period of time, while at the same time actively providing the newly founded enterprise with management advice and support. As a rule, no dividend is distributed on the capital invested and the return on the investment is realized with the sale of the participation at the end of its term. For this reason, the growth dynamics of the companies in which they invest are an aspect of central interest to venture capitalists. However, venture capital implies more than the mere provision of capital. The ultimate success of a young company depends just as much on the contribution of entrepreneurial expertise.

The definition of venture capital is thus based on purely qualitative criteria, a fact that renders it difficult to clearly differentiate venture capital from other forms of financing through private equity. Generally, we distinguish two types of venture capitalists: informal venture capital investors – either private companies or private individuals (business angels) – and institutional capital donors such as corporate venture capital companies or equity investment companies.

3.1 Business Angels

Informal private investors *(business angels),* who provide funding for companies in the seed and early stages, fill the gap between founders and family members on the one hand, and banks and venture capitalists on the other hand. Angels not only invest capital, but support the startups with counseling and business contacts. Typically, business angels are former entrepreneurs who have sold their businesses and therefore often share sectoral experience or other important expertise.

As business angels are private individuals (though mostly wealthy ones), they generally invest relatively small amounts of money. Angels' investments focus on the project or founding stage, when the transfer of know-how plays a relatively important role. For follow-up financing (or funding requirements exceeding the business angels' contributions), the companies have to

find new sources of financing. Angels generally invest their money without demanding very high formal standards; often, the goals and performance targets are not distinctly defined. On the other hand, the information gap is less pronounced if the angel and the entrepreneur work in the same sector and are even personally acquainted. However, for all these reasons it is important for the business angel to have some measure of control over the management of the company and its intentions and actions, and to reduce the agency risk by securing the entrepreneur's commitment (Bell, 1999).

Due to the informal nature of this type of investment, precise data regarding the size of this market are not available.[1]) In an effort to reduce research and information costs, which are considered to be the major obstacles preventing the efficient functioning of this market, some countries are endeavoring to formalize the business angels market. In Austria, in 1997 *Innovationsagentur* set up an exchange for business angels with its Business Angel Network i[2] ("ideas x investment"). i[2], which brings together entrepreneurs and investors, aims at creating an efficient risk capital market primarily for small and young enterprises and small-scale capital investments modeled on the efficiency criteria of the stock market and its environment. By December 1999, the i[2] network had recorded 116 entrepreneurs in search of capital and 78 potential investors on its list and had established more than 200 contacts between enterprises and investors.[2])

3.2 Venture Capital Funds

Venture capital funds or simply venture funds are financial intermediaries. They collect capital from investors and invest it in companies. Mostly, outsiders know little about the situation and development perspectives of these companies. The money invested in these funds remains tied up for the entire investment period. The funds' shares are not fungible. Consequently, the investors must be in a position to tie up their capital for a relatively long period of time. Venture funds may be independently organized by professional money managers or subsidiaries of companies investing, for example, in ventures that complement their research and development programs, or they are set up by the public sector. Depending on their structure, the assets of venture funds stem from different groups of investors: Dependent funds are financed either by their parent companies or by the public sector, whereas independent funds obtain their capital from private individuals or institutional investors such as banks, pension funds and insurance companies.

Venture capital funds provide enterprises with capital by acquiring a stake in the company. With the capital contributed, the investor bears the

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1   The European Commission (1999) cites a study according to which the number of business angels in Europe amounts to about 125,000.

2   Five investment contracts were concluded. In concrete figures, 47 enterprises in search of investors and venture capital in the amount of ATS 691 million compared with 47 investors disposing of a maximum participation capital of ATS 421 million at the end of 1999. 68% of these investors were private individuals (entrepreneurs or persons with other management qualifications). The average investment amounted to ATS 3.3 million (in some cases split up into several tranches). The remaining investors listed with i[2] break down into 6% venture funds or equity investment companies and 26% corporate investors.

full entrepreneurial risk. Mostly, these investments – typically restricted to a term of three to ten years – take the form of a (minority) participation by the investment company. If the venture proves successful, the venture fund's return on the investment, rather than taking the form of dividends, consists in a value enhancement realized at the end of the startup phase, when the shares of the company are sold either within the context of an initial public offering or through other channels. Hence, the venture capitalists' return consists in a value enhancement of the stake held in the respective company.

High-tech startups are not the only companies to benefit from venture capital, as many U.S. examples prove.[1]) Typically, the need for capital increases as a business mature. Venture capital is not restricted to seed and startup financing, but is employed at different stages of the financial growth cycle. Its comparative advantages are the most pronounced during the early stages, when the risk of failure is still particularly high. Mostly, the capital is made available in several tranches. In the seed phase – even before the company is founded – business plans must be drawn up. During the startup phase, the capital serves to finance e.g. product development and early marketing measures. During the expansion stage, the equity contributions focus on financing the company's further growth.

Venture capital is a highly risky form of investment finance. In a typical portfolio, the lion's share of the return comes from just one or two successful ventures, while the rest of the ventures yield moderate returns or even make losses. The diversification effect of spreading investments secures a better return/risk ratio than could be achieved by investing directly in individual startups.

One of the main tasks of a venture capital firm is to select potentially successful projects from the wide range of business plans submitted. Generally, investment projects are screened within the context of a due diligence procedure, which takes two to three months. U.S. venture capitalists take up only about five out of roughly 100 business plans submitted. Individual investors lack the means to conduct these due diligence procedures efficiently. Investors would have to carry out the examination individually and on their own account, which involves the risk that they start relying on each other and the projects are not reviewed at all. Hence, handling of such scrutiny procedures by an intermediary is likely to be more efficient.

The successful selection of projects requires experience and entrepreneurial expertise on the part of the equity provider. Unlike a simple credit assessment, the project selection requires the comprehensive entrepreneurial experience and management competency pooled in venture firms. Often, venture capitalists specialize in just a few sectors which they know particularly well. The return on their investment hinges on the careful selection of ventures and the quality of their counseling and monitoring. Hence, the venture funds are challenged to perform these tasks to the best

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1   See e.g. Keuschnigg (1998). Beside well-known companies in the software, computer, biotechnology and genetics sectors, a list of U.S. enterprises whose early stages were financed with venture capital features a number of companies whose success is based on traditional products and services (see p. 5).

of their ability and in further consequence enhance the chances of success of the enterprises in their portfolio.

Consultancy, monitoring and providing support to the management of newly founded companies are important functions of venture funds.[1]) Especially high-tech firms have valuable technological know-how, but often lack the required commercial expertise. In many cases, companies fail due to inadequate management capabilities.[2]) Mostly, the companies are required to submit monthly reports. Continuous monitoring and control is also key to tracking and discontinuing unsuccessful projects in good time. The chances of success are often difficult to assess, especially in the case of highly innovative projects. The entrepreneur controls the allocation of the funds within the enterprise; for the lender it is difficult to monitor where the funds actually go. Inadequate information flows between the lender and the entrepreneur may have severe consequences in this situation, as they may result in adverse selection and moral hazard. An extensive exchange of information and monitoring puts venture capital funds in a position to cope with the moral hazard implicit in the principal/agent relationship more efficiently and in many instances helps reduce the risk.

In Austria, the organizational structures of the venture capital market as a financial market segment have been developing rapidly since 1997, in tandem with the implementation of state assistance measures (see section 4). In the past two years, new investments increased from ATS 11 million to almost ATS 700 million (EVCA, Yearbook 1999). In June 1999, a total of 24 venture capital firms offered their services in Austria (as compared to 10 in 1994). 12 of these companies are fully or majority-owned by foreigners. The average investment amounted to ATS 13 million, with investment volumes varying between ATS 5 million and ATS 40 million depending on the venture capital firm (Innovationsagentur, 1999).

Comparable international figures are available only within more comprehensive statistics including all types of private equity investments, such as company acquisitions, etc. (EVCA, Yearbook 1999). According to these figures, Austria's share in the European venture capital market is still very low by international comparison, amounting to just 0.35% (of 17 countries included) in 1999 and on a par with Portugal's share. The United Kingdom accounts for about half of all venture investment in Europe (49.1%), followed by Germany with a share of 13.5% and France with 12.3%.

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1   The founders of an enterprise — beside obtaining a share in the company's profit, which depends on their remaining stake in the company — usually receive a basic remuneration (typically ATS 50,000 per month). Such an arrangement is problematic in so far as it may affect their incentive. The entrepreneur's profit participation and hence risk must remain high enough to ensure that he or she continues to apply the diligence and care of a prudent businessperson. Entrepreneurs who sell 80 or 90% of their shares in the company to a financing firm and in return negotiate a handsome remuneration may lose the incentive to apply themselves fully to the project.

2   According to statistics of the Austrian debt-collection and insolvency services company Kreditschutzverband von 1870 listing the reasons of business failures, the bankruptcies filed in 1999 were for the main part due to management errors and internal sources of loss (36%) as well as negligence (25%); only 15% of the insolvency cases were caused by a shortage or lack of capital.

Not all the capital raised by venture capital funds is earmarked for immediate investment, but to some extent reserved for additional investment in successful projects. The difference between the total capital available for venture investments and the amount of capital actually invested in entrepreneurial projects is currently still higher in Austria than on the European average. This discrepancy is probably due to the relatively early development stage of Austria's venture capital market.

Development of the Venture Capital Market				
	Europe		Austria	
	raised	invested	raised	invested
	ATS billion		ATS million	
1989	84.7	62.2	×	×
1990	66.7	60.1	×	×
1991	60.5	66.9	×	×
1992	59.9	66.8	×	×
1993	46.6	56.0	×	×
1994	90.4	73.5	×	×
1995	57.3	72.3	17	14
1996	105.5	90.0	336	11
1997	275.7	133.1	845	259
1998	282.4	200.8	1,700	695

Source: EVCA, Yearbook 1999; OeNB.

In the period from 1995 to 1998, venture capital funds operating in Austria invested a total of about ATS 1 billion, while raising almost ATS 3 billion. At the end of 1998, close to ATS 2 billion were still available for further investments. In 1998, the funds' resources amounted to ATS 1.7 billion, whereas the value of funds invested in the portfolios amounted to just 40% of this total. The utilization rate increased by comparison to the previous year (30%). On a European average, 70% of the funds' resources were invested in the past three years, but this ratio also fluctuated strongly, dropping especially at times when the amount of funds made available increased steeply. Moreover, it must be taken into account that the selection and scrutiny of suitable investment projects requires a considerable amount of lead time. Moreover, the figures also include the volume of funds made available by foreign firms investing in Austria and Austrian venture capital funds with international investments, i.e. funds that are not necessarily invested in projects in Austria.

In Austria, as in Europe in general, only few venture capital firms focus exclusively on seed and startup financing, since most of them invest a relatively large share of their funds in the expansion phase of enterprises. In the U.S.A., venture funds concentrate to a much higher degree on the early stages of startups. This phenomenon is explained by the relatively small size of the European companies and the low financing volume involved. A concentration on early-stage financing would in most cases imply disproportionately high fees required to cover the costs of scrutiny procedures and the preparation of financing concepts (Innovationsagentur, 1999). According to EVCA data, none of the private equity investments made in 1998 related to seed-phase projects, whereas startup investments

accounted for one fourth of the funds invested, and almost half of the capital made available was funneled into expansion-stage projects. The remaining volume was spent on acquisitions.

Private Equity Capital				
	Austria			Europe
	1997	1998		1998
	ATS million		Share in %	
Banks	700	695	39.7	27.8
Government agencies	96	391	23.0	5.1
Private individuals	20	320	18.8	7.6
Corporate investors	30	295	15.2	9.8
Pension funds	×	34	2.0	24.0
Realized capital gains	0	12	0.7	8.8
Insurance companies	×	9	0.5	8.9
Others and unknown	×	1	0.1	7.8
Total	846	1,700	100.0	100.0

Source: EVCA, Yearbook 1999; OeNB.

Discrepancies in the investment behavior of Austrian and international venture capital firms may partly be due to the early development stage of the Austrian venture capital market. Differences in the structure of the venture capital firms and the objectives of financing firms may also play a role. Austrian venture capital funds are primarily in the hands of banks, which independently operate equity investment companies and procure about 40% of the capital invested in Austrian venture funds. The majority of foreign funds, by contrast, are owned by private individuals and private companies.

Banks play an important role in procuring risk capital also at the European level, even though they account for a somewhat lower share than in Austria. Conspicuous features in Austria are the high share of government agencies and the extremely low share of pension funds. In Austria, public-sector institutions figure much more prominently in providing equity than on the European average. Quadrupling between 1997 and 1998, their share of capital contributions expanded at an extraordinarily high rate. Venture investments by the corporate sector also expanded strongly, rising from 3.5% in 1997 to 15.2% in 1998.

In a number of countries, for example the United Kingdom, Finland and Sweden, pension funds feature as the proportionately largest source of private or venture capital (OECD, 2000). By contrast to mutual funds, which given their readiness to redeem the mutual fund shares sold cannot afford to invest in such highly illiquid instruments, pension funds with their longer investment horizon and more easily assessable disbursement profiles could consider venture capital a feasible form of investment. Even though the recent amendment to the Austrian Pension Fund Act provides for an expansion of the funds' options to invest in more risky equity instruments, the pension funds' actual share of such investments is still far below the statutorily defined limits.

4 Framework Conditions for Venture Capital

4.1 State Assistance Schemes

In view of the specific problems startups generally encounter, many industrialized countries have launched a number of initiatives to improve access to venture capital and thus close the gap between demand for seed and startup capital with its very high risk profile and the amount of funds made available by private venture capitalists. However, these initiatives are by no means intended to crowd out private venture capitalists from the market. The intention of this form of state assistance much rather goes beyond the objectives of private investments, implying that the state is more capable of identifying areas promising high social and/or private return on investment (OECD, 2000).

In a number of countries, the state itself features as venture capitalist, investing directly in new enterprises – either in the form of investments in private venture funds or by establishing its own venture funds. One of the explicit reasons for this approach was the assumption that the private sector failed to put up enough capital to finance startups. In the U.S.A., the state assumed a crucial and active role in financing new enterprises, especially high-tech companies. In the decade between 1958 and 1969, public-sector venture capital investments were more than three times as high as private-sector investments (Lerner, 1996). However, with these assistance schemes, the state neither enters into coownership of the companies, nor does it acquire any title to intellectual property the company may develop with the capital thus made available.

Several countries promote the provision of risk capital by granting loans at attractive terms or redemption-free or nonrepayable loans in the event the enterprise should fail.[1] Public-sector lending schemes improve the access to debt financing for young enterprises and at the same time enhance the "risk-bearing capacity" of outside capital. However, these programs, rather than representing a form of equity capital subsidization, enter into competition with the venture capital market. The same applies to credit guarantees, which, by helping to solve the problem of lacking collateral, enable banks to finance promising projects. Should the debtor turn insolvent, the creditor's loss is limited to the nonguaranteed portion of the loan. In some countries, the state provides tax incentives for investors, which are mostly in the form of tax deductibles and which are generally limited depending on the amount and sector involved and on the development phase of the enterprise. However, this approach requires that sufficient funds are available for venture investments to be channeled into specific sectors.

Frequently, potential investors are deterred by the high risk involved. Equity capital guarantees are based on the concept of risk tolerance through risk sharing. The public sector offers capital guarantees in several European countries.[2] The Austrian government also opted for assisting young

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1   However, the individual statutory regulations provide for limits to such lending (see subsidization and competition law).

2   See in greater detail OECD (2000), p. 27.

enterprises and promoting the provision of venture capital by granting equity capital guarantees. These guarantees provide security for equity capital private and institutional investors put up by acquiring a stake in specific enterprises without, however, influencing the project selection process. This approach is based on the assumption that profit-oriented financing firms are in a position to make more informed decisions determined by efficiency considerations than the agencies granting public-sector assistance would be able to make (Keuschnigg and Strobel, 2000). The extent to which young enterprises take recourse to both these programs has markedly increased during the past few years. Since 1997 the Austrian BÜRGES Förderungsbank has been offering guarantees for equity capital for small and medium-sized enterprises (SMEs) under its promotion programs. These equity capital guarantees cover the risk of interests of natural persons up to an invested amount of EUR 20,000 or ATS 275,000 per investor[1]) up to 100% and up to 50% of amounts exceeding this limit. Up to 50% of the interests of all other investors (e.g. other corporate investors, institutional investors) are covered. The guarantee does not extend to any shares in profits. Hence, the equity capital guarantee provides cover for the principal exposure of a participation, but not the earnings risk. The term of the guarantees is limited to ten years. A guarantee fee of at least 0.5% p.a. (depending on the size of the risk) is charged for the term for which the guarantee is granted.[2])

The Technology Financing Program (TFP) initiated by Finanzierungs-garantie-Gesellschaft (FGG) in 1997 as a component of its venture capital initiative aims at giving SMEs with a strong technological orientation access to venture capital. The program combines a participation guarantee securing a defined share of the paid-in capital, which is provided to the venture capital company, with a guarantee for a loan granted to the respective company. FGG thus mobilizes equity and assumes part of the credit risk. For its services, FGG charges a handling fee and a guarantee fee, and receives a performance-related remuneration.[3])

Equity Capital Guarantees
by Austrian Government Agencies

	BÜRGES	FGG[1])
	ATS million	ATS billion
1996	×	0.2
1997	×	1.5
1998	94.5	2.3
1999	322.6	3.0

Source: BÜRGES, FGG.
[1]) Data as at June 30 of the respective year.

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1 This is the same amount up to which bank deposits are protected by the statutory deposit guarantee.
2 For a detailed description see Dorn and Stein (1999), Braumann (1999) as well as Kühnelt and Lichtmannegger (1997).
3 Several federal provinces, for instance Carinthia and Vorarlberg, have additional separate programs offering guarantees for enterprises.

The Seedfinancing Program offered by the Innovation and Technology Fund (ITF) aims at financing the growth of innovative young enterprises during their startup and early-stage expansion by providing startup financing specifically tailored to the needs of these phases of business development. Innovationsagentur acts as the management company of this startup financing program. Eligible companies obtain access to startup capital as well as the required consultancy services. The financing package relates to the costs incurred in the course of founding and establishing the business and opening up a market and comprises the provision of both startup capital and consultancy services.[1]) Startup capital is made available in the form of mezzanine capital, which implies that interest and redemption depend on the profit. The maximum value of capital and services provided is ATS 10 million.

4.2 Exit Mechanisms − Stock Markets for Growth Companies

As investors do not get a regular return on venture capital, the attractiveness of venture capital investments depends very much on the opportunities investors have to sell their stakes at favorable terms at the end of the investment period. Possible forms of selling these interests basically include a takeover of the entire company or part of it by another company (trade sale) or another investor (private placement) or the sale of shares through a stock exchange (going public), as well as a repurchase of the stake by the company itself.

Depending on where their interests lie, a high market value may be of equally crucial interest both to the venture capital company and the entrepreneur. Hence, the evaluation of the company's value may give rise to conflicts of interests.

If a company decides to repurchase its shares, it regains full independence, but a buyback may result in liquidity bottlenecks, as it may be difficult for the company to raise the necessary funds. The sale of shares to third parties has the advantage that no liquidity is withdrawn from the company. Moreover, valuation conflicts are prevented because the price is fixed by a well-organized market. In fact, it is mostly through a stock market listing that investments in seed and startup firms pay off well for the investor.

The development of venture capital as a capital market instrument is still in a nascent stage in Austria, which is why the volume of exits is still relatively low. According to EVCA data, investors disposed of a total volume of about ATS 200 million in equity capital investments in 1998 (according to BVK[2]) data, the corresponding German figure was DEM 725 million, which translates to some ATS 5 billion). Public offerings via the stock exchange still play a subordinate role as an exit mechanism. In 1998, only two venture investments were terminated by going public, whereas in Germany the

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1   *In total, 93 companies had been financed by the end of 1998. Five of these were eliminated from the portfolio due to failure before the startup capital was paid out; eleven companies turned insolvent. At the end of 1998, the program covered 77 companies, in which a total of ATS 162 million had been invested.*

2   *German Venture Capital Association (Bundesverband Deutscher Kapitalbeteiligungs-Gesellschaften).*

stock exchange accounted for about one-fifth of the entire exit volume. In Germany, the volume of venture capitalists' stakes repurchased by the companies themselves is also much higher, whereas in Austria almost half of all venture investments are terminated through sales to third parties, i.e. either to enterprises or to other equity investment companies.

Exits from Venture Capital Investments 1998

	Austria	Germany
	Share in %	
Sales to third parties	47.5	32.3
IPOs	6.5	20.2
Repayments	6.8	43.5
Write-offs	12.2	×
Others	27.1	4.0
Total	100.0	100.0

Source: EVCA, BVK.

Well-functioning stock markets for growth companies are extremely important for the venture capital market, as this is where equity investment companies are able to sell their stakes at the end of the investment period and realize their gains.[1] For this reason, stock exchanges in many countries set up new trading segments for medium-sized growth companies, e.g. the EASDAQ in Brussels, Neuer Markt in Frankfurt or Nouveau Marché in Paris. Within the context of the redefinition of its market segmentation, Wiener Börse AG in 1998 also introduced a market segment specifically addressed to medium-sized growth stocks, the *Austrian Growth Market (AGM)[2]*, which in its conception largely resembles Deutsche Börse's Neuer Markt (Fiala, 1999). The AGM regulatory framework includes a number of quantitative and qualitative criteria – among other things, disclosure requirements that do not fall short of international standards. Companies qualifying under the AGM listing requirements benefit from the reputation of meeting exacting valuation standards (Kaufmann, 1997).

IPOs of Austrian Growth Companies

	1997	1998	1999
	EUR million		
EASDAQ Brussels	72.1	153.9	22.0
Neuer Markt Frankfurt	×	×	462.8
Wiener Börse AG	18.2	57.9	166.9
Total	90.3	211.8	651.7

Source: Wiener Börse AG.

In recent years, the number of Austrian growth companies going public on Wiener Börse AG or on exchanges abroad has increased considerably.

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1   On the other hand, this ensures a constant flow of IPOs. In this context, the European Commission (1999) refers to studies indicating a correlation between the growth of the U.S. venture capital market and the U.S. market for newly issued stocks in the 1980s.

2   Under the designation "fit," Wiener Börse AG had set up a market segment for innovative growth companies already in the spring of 1997. However, due to a lack of support by the market participants (banks), this project failed to turn out successfully.

However, the vast majority of these initial public offerings did not relate to exit sales of venture capitalists. As the Austrian venture capital market continues to expand and the required institutional framework is in place, the role of the stock exchange as an exit route for venture capitalists is likely to increase over the next few years.

5 Conclusion

Venture capital employed for young enterprises' startup financing and early-stage expansion accounts for just a minor share of the investments on which a nation builds its capital stock. Even if it is small, this share is an important component of overall investment because of the stimulus it provides for innovation, growth and employment in the economy in general. Fast-growing innovative small and medium-sized enterprises (SMEs) are one of the main engines driving growth and employment across Europe. Coopers & Lybrand (1999), comparing 219 companies financed with venture capital in 12 European countries with the development of Europe's 500 largest corporations in the period 1991 to 1995, showed that venture-backed companies attained twice the growth rate of the large corporations, exhibited a markedly higher level of job creation (15 against 2%) and boasted disproportionately high capital spending and export growth.[1])

In Austria, the structure of the corporate sector is still characterized by a predominance of small and medium-sized enterprises and the financing sector continues to be heavily dependent on banks. Therefore, public-sector incentive programs constitute a means of promoting venture capital investments. Economic agents in Austria are increasingly taking recourse to capital guarantees provided by government agencies. This indicates that the shift away from subsidizing outside capital – e.g. in the form of subsidized loans or other forms of assistance – towards the promotion of equity capital had a significant role in triggering the substantial expansion of venture capital financing observed in Austria in the past few years.

Lerner (1996) demonstrated that the direct provision of venture capital by the government merely helps to reinforce already existing trends. Employment and sales growth reached significantly higher rates in states with a robust private venture capital market than in states with low private venture capital investment activity. This would imply that government assistance, while serving to fill some concrete financing gaps and to reinforce private-sector activity, cannot replace the latter. Still, government assistance should not reduce the private investors' risks to an extent that stifles their incentive to select promising projects with care and thoroughly examine their viability. It is important to note in this context that the contribution of venture capital is more than just providing capital, but also comprises monitoring and consultancy for young enterprises as central elements. This contribution would be lost if the state were to assume the full risk.

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1   The European Commission (1999) also refers to a number of other studies on this topic yielding similar results.

There are differences in the structure of investors at the Austrian and at the European level. These differences point to the future development focus in the fields of private risk capital in general and venture capital in particular: Private households, which on account of their traditional financing surplus resulting from their savings habits would be the corporate sector's "natural financiers," held merely 8% of the shares issued in Austria. The banks' predominant role in the Austrian venture capital market is reflected by the share of holdings of stocks issued by (nonfinancial) corporations, which is disproportionately high even by international standards. Accounting for about one quarter of total holdings in 1995 (according to the OeNB's financial accounts statistics), banks' stock holdings were clearly higher in Austria than in other countries with full-service banks predominating in the banking system, as for example in Germany and Japan (Deutsche Bundesbank, 1997). Moreover, by international comparison, institutional investors still assume a subordinate role. To a considerable extent, this is no doubt attributable to the structure of the pension insurance system. In countries using the funded system, the volume of funds available on capital markets is naturally much higher than in countries with pay-as-you-go pension systems. As private and occupational pension schemes are gaining importance, the Austrian capital market is likely to draw additional strength from these sources. Given a broader and deeper market, the venture capital commitments of pension funds may well be increasing also in Austria.

A few figures evidence Austrians' keen interest in risk capital, both on the part of issuers and investors: At the end of 1998, 14% of EASDAQ issuers were Austrians. This share corresponds roughly to that of France, and is much higher than that of the United Kingdom, Italy and Germany. At the same time, almost 6% of the initial public offerings transacted through EASDAQ were placed in Austria (Kapitalmarkt Österreich, 1999, p. 234).

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Risk Analysis of a Representative
Portfolio of International Assets

Martin Scheicher

This study reflects the rising importance of risk analysis. Primarily used for portfolio management in the 1970s and 1980s, risk analysis became attractive for measuring market risk in the 1990s. The new approach to market risk was, on the one hand, influenced by J. P. Morgan's RiskMetrics concept and by changes in the supervisory framework on the other. To identify their value at risk (VaR), i.e. the expected maximum loss in their trading books, banks are now required to implement methods to compute the market risk to which they must apply capital charges.

With international financial markets becoming ever more intertwined, few institutional investors have stuck with domestic assets only. As a consequence, stock prices, which in the past had been determined mainly at the national level, have become increasingly interdependent. Critical news is spread across global financial markets within one and the same trading day. Moreover, the past few years have witnessed a diversification of portfolios not just among assets from industrial nations, but also to securities from emerging markets, such as Southeast Asia, South America as well as Central and Eastern Europe, demand for which has continuously grown. At the same time, integration within the European Union has proceeded at a fast pace. Owing to the Single Market and especially to European Monetary Union (EMU), the importance investors used to attach to the country has shifted to the economic sector in which the corporation does business. In the light of globalization, analyzing a national market in isolation has been rendered more or less obsolete.

This study takes both of these significant developments into account. In choosing the model, we accounted for a critical statistical property of financial time series. As shown in a host of research papers, time-dependent risk, which is subject to considerable fluctuations, is inherent in financial time series. A recent case in point was the Russian financial crisis in the summer of 1998, when stock prices gyrated wildly within a short period of time. Upon this observation, empirical capital market researchers introduced dynamic specifications to risk measurement. In other words, static analysis assuming risk as constant can provide only little insight into the actual risk. Therefore, we used a model based on time-dependent variances and covariances to capture the risk of key international securities. The types of investment studied are European shares and bonds as well as North American, Asian and Eastern European shares. In the pertinent literature such assets have been examined from the U.S. dollar perspective, but not yet from the euro angle. This paper is meant to close this gap. Also, Eastern Europe has been rather neglected in the literature so far. Statistical methods and risk management principles serve to evaluate the performance of the approach chosen. To ascertain whether this methodology is suitable for calculating the regulatory capital requirement, we compute how many times the actual loss of a hypothetical portfolio exceeds the value generated by the model.

The first section lays the theoretical groundwork for risk modeling, providing an overview of the literature and introducing a model for capturing the risk. This is followed by a description of the data set and its statistical properties. The third section presents the outcome of the

estimates produced by the model. Also, several methods are employed to test the specifications, and the resulting changes in the risk measures are interpreted. This leads to projections of the covariances. The fourth section summarizes the most important findings and discusses the consequences for calculating the market risk.

1 Risk Modeling

1.1 Basic Modeling Concepts

The daily rate of return on a given security represents the key input for risk analysis. It is defined as the difference of the log stock price, exchange rate or index value between two trading days. The daily rate of return shows the relative change in price from one day to the next. These returns are random variables, which is why future yields are uncertain from the present perspective. According to financial economics, the expected return is determined by the risk inherent in the assets. The volatility or variance of the return serves to measure the total risk of a security, which may be broken down into systematic and unsystematic risk. Overall economic developments impact systematic risk, which, thus, cannot be diversified away. By contrast, unsystematic risk, which is specific to companies, such as the risk of bankruptcy, may be reduced to zero in a well-diversified portfolio. It follows that only the systematic risk affects the expected price change. The covariance of the individual security with the market portfolio comprising all securities captures systematic risk. The Capital Asset Pricing Model (CAPM)[1] provides the theoretical foundation for these relationships. In equilibrium, only the systematic risk measured by means of the beta factor is priced, while the company-specific risk does not yield any additional expected return.

To use such theoretical results in an econometric model, it is necessary to take account of the statistical properties of the returns. Only then does a specification capture the actual parameters of the financial time series and consequently fit the data. Numerous papers on this topic[2] emphasize two findings. Firstly, returns are not normally distributed, because the empirical distribution of the price changes is marked by the stylized fact of fat tails. Irrespective of their sign, these large price changes show a relative frequency higher than could be expected of the density function of the normal distribution. Secondly, volatility fluctuates over time along a predictable pattern. Periods in which the price movements are large alternate with periods in which fluctuations are rather minor. This dynamic behavior of volatility also contrasts with the static concept of the unconditional normal distribution. As early as in 1965, Fama wrote about both these observations, confirmed since then for daily price changes of shares, stock indices, interest rates and exchange rates.

To reproduce these properties of the returns, we use a Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model. This approach, which is based on time series analysis, models time-dependent

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1   For a detailed description, see chapter 5 in Campbell et al. (1996).

2   For an overview, see Geyer (1992) or Pagan (1996).

risk, giving explicit equations for the conditional covariances and variances. It is widely used in empirical capital market research.[1] *Heteroscedasticity* denotes the changing variance. The variance is *conditional* – today's volatility is calculated from yesterday's perspective via an *autoregressive* structure relying on yesterday's volatility. Last but not least, the model is *generalized,* as it contains a number of determining factors apart from past returns.

1.2 The Econometric Model

The given bivariate model[2] defines the specifications for the excess return of the market portfolio and the excess return of security i as follows:

(1.1) $$R_{mt} = m_{11} + g^* h_{mt} + u_{mt}$$

(1.2) $$R_{it} = m_{12} + g^* h_{imt} + u_{it}$$

(2.1) $$u_t | I_{t-1} \sim N(0, H_t)$$

(2.2) $$H_t = \begin{pmatrix} h_{mt} & h_{imt} \\ h_{imt} & h_{it} \end{pmatrix}$$

(3) $$H_t = C'C + A'H_{t-1}A + B'u'_{t-1}u'_{t-1}B$$

with:

R_{mt} excess return of the market portfolio $\left(= r_{mt} - r_t^F \right)$
R_{it} excess return of security i $\left(= r_{it} - r_t^F \right)$
h_{imt} covariance between share i and the market portfolio
h_{it}, h_{mt}
      variance of security i or the market portfolio
u_t two-dimensional vector of innovations $\left(u_{mt}, u_{it} \right)'$
I_{t-1} information available at t–1 (past returns)
H_t conditional two-dimensional covariance matrix
C   symmetric two-dimensional matrix
A,B   diagonal two-dimensional matrix

Coefficient g measures risk aversion and may be regarded as the price of covariance risk.[3] The variances and the covariance are given in the form of equations:[4]

(4.1) $h_{mt} = c_{11}^2 + c_{12}^2 + a_{11}^2 h_{mt-1} + b_{11}^2 u_{mt-1}^2$

(4.2) $h_{imt} = (c_{11}c_{12} + c_{12}c_{22})^2 + a_{11}a_{22}h_{imt-1} + b_{11}b_{22}u_{it-1}u_{mt-1}$

(4.3) $h_{it} = c_{12}^2 + c_{22}^2 + a_{22}^2 h_{it-1} + b_{22}^2 u_{it-1}^2$

Univariate GARCH models are used to describe the volatilities. Squaring of the coefficients ensures that the variances are invariably positive.

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1   *See also the overview provided by Palm (1996).*
2   *For an overview of this methodology, see Engle and Mezrich (1996), or refer to Bollerslev et al. (1988), Longin and Solnik (1995), Kroner and Ng (1998), Hanson and Höhrdahl (1998) or Scheicher (2000).*
3   *This price must equal the price of the variance risk presented in the model by Merton (1980).*
4   *These equations were established by Engle and Kroner (1995).*

This is the major advantage over other approaches, which do not rule out negative variances.

Such models allow for analyzing individual securities – and what is more – entire categories of securities.[1] The model at hand focuses on regional stock indices, which is why this type of CAPM is referred to as an International Capital Asset Pricing Model. The expected return of, say, North American equities, is computed as the product of the price of the covariance risk and the respective systematic risk as measured via the covariance with the world portfolio. Within the variance/covariance method for calculating the VaR, this approach represents the basis for mapping the individual securities or securities categories to risk factors.[2]

The maximum likelihood approach is employed to estimate the ten parameters of the bivariate model using the return time series. To this end, the following log likelihood function is maximized numerically:

$$(5) \qquad \Gamma = \sum_{t=1}^{T} \left(-\frac{n}{2} ln(2\pi) - 0.5 ln|H_t| - 0.5 u_t' H_t^{-1} u_t \right).$$

2   Characteristics of the Data Set

The sample is taken under the assumption that the hypothetical portfolio held by an investor resident in the euro area comprises the most important categories of securities, namely equities from North America, Asia Pacific, the euro area, Eastern Europe as well as German government bonds. The daily observations making up the sample data span the period from January 3, 1995, to July 23, 1999. The following data series are used for the market risk model estimations:

– MSCI North American Stock Index (U.S. dollar)   North America
– MSCI Asia Pacific Stock Index (U.S. dollar)   Asia Pacific
– MSCI Eastern European Stock Index (U.S. dollar) Eastern Europe
– MSCI Euro Area Stock Index (euro)   Euro area
– REX bond index (euro)   German bonds

The indices compiled by Morgan Stanley Capital International (MSCI) weight equities according to total market capitalization and free float. This is to ensure that the investment conditions and liquidity of a capital market are captured as realistically as possible. At least 60% of a market's total capitalization are captured. These series are considered as benchmark data sets. For the purpose of this study, the euro area is viewed as an integrated capital market. The elimination of segmentation[3] is one of the key effects of European Monetary Union and the Single Market. In the sample at hand, the REX index represents the bond market. This index covers all German government bonds with a residual maturity of 0.5 to 10.5 years. As corporate bonds are not yet traded as heavily in Europe as in the U.S.A., the study focuses on securities issued by public debtors from Germany, which

1   See, for instance, De Santis and Gerard (1997) or Fischer and Keber (1998).
2   This is also outlined in the RiskMetrics Technical Document of J. P. Morgan (1995).
3   See the study by Hardouvelis et al. (1999).

represent one of the main types of investment in the euro area. The risk-free interest rate corresponds to the three-month Euromark money market rate. The market portfolio used in the CAPM is based on the Morgan Stanley Capital International (MSCI) World U.S. Dollar Price Index (= world).

The U.S. dollar returns are converted into euros. The base currency used prior to the beginning of European Monetary Union is the Deutsche mark. For this reason, this study assumes that the Deutsche mark was used before the start of EMU.[1]) Retroactive usage of the irrevocably fixed euro conversion rates of December 31, 1998, must be ruled out, since this valuation is applicable only as of that point in time and since the historical returns cannot be mapped to current exchange rates. In the same vein, it is not possible to employ the ECU, the euro's predecessor, as this currency unit was officially set at parity only at the end of 1998. As regards the consideration of the exchange rate risk in the International CAPM, we assumed that not all foreign currency liabilities were hedged by derivative transactions.[2])

Table 1 gives an overview of the statistical characteristics of the returns: the annualized means, the maximum and minimum daily price change, the annualized volatility (in percent), the skewness, the kurtosis, the Jarque-Bera test for normality and four autocorrelation tests. At 23% per annum, North American securities scored the highest return, while investment in Eastern European assets resulted in a loss of close to 7% per annum. Eastern European assets displayed the most extreme price changes, with prices, for instance, plummeting by 16% or jumping by almost 10% overnight (a similar behavior was observed for Asia Pacific). With an annualized fluctuation band of more than 30%, Eastern Europe is the most volatile market. At the other end of the spectrum, the index tracking the bond market, REX, records the smallest annualized variance, namely 3%. The next three rows of table 1 refer to the distribution of the returns. Skewness (third moment) measures the asymmetry of a distribution around its mean, and kurtosis (fourth moment) characterizes the shape of the tails, i.e. the likelihood of extreme price changes. In a normal distribution both skewness and kurtosis have a value of zero. All distributions are asymmetric and show excess kurtosis. In other words, they have the above-mentioned fat tails. This means that larger price movements, indeed, occur at a higher frequency than would be expected of a normal distribution. The Jarque-Bera test corroborates the invalidity of the normal distribution. Here, the standard static model is rejected, too. By means of the autocorrelation test (Q test) of Ljung and Box (1978)[3], the final four rows of table 1 examine whether there are any linear dependencies in the returns and their squares. It becomes evident from table 1 that all return time series

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1   Given the Austrian schilling's peg to the Deutsche mark, the results of this study also apply to the Austrian context.

2   Assuming unhedged returns is the standard perspective in risk analyses based on the portfolio theory; see, for instance, Ramchand and Susmel (1998).

3   Defined as: $Q = N(N + 2) = \sum_{j=1}^{24} \frac{\rho_j}{N - j}$, with N = number of observations, $\rho_j = j$ autocorrelation.

are characterized by a significant linear dependence. This observation, which is frequently mentioned in the literature with respect to stock indices, is traceable to the fact that not all stocks are traded on a daily basis. Hence, some prices remain constant for several days. Such asynchronous trading results in high autocorrelations.[1]) We come back to this characteristic later, when testing the model. The last two rows of table 1 indicate whether there is autocorrelation in the squared returns. The null hypothesis is homoscedasticity or constant variance. All time series show time-dependent variance. As the variance is autocorrelated, it does not follow a random pattern, but depends on time. Owing to this dependence, it is possible to predict the volatility.

The analysis of the statistical characteristics has, thus, confirmed the two above-mentioned regularities for the sample at hand: time-dependent variance and a nonnormal distribution of the returns. The data set consequently meets the requirements for estimating the GARCH model. Moreover, it follows that a specification with constant variance and covariance is not compatible with the characteristics observed in the sample.

3 Empirical Results

3.1 Estimation Results of the Time-Dependent CAPM

Table 2 summarizes the estimation results of the conditional CAPM. The estimates concern five bivariate models, each with an index (series indexed at i) and the MSCI World Index (series indexed at m). The table shows that the estimates of the price of the covariance risk diverge among the various regions. The highest value (8.12) is given for the combined euro area/world region, while the value indicated for Eastern Europe is slightly negative. These results are, however, not significant, as the estimates of this coefficient are not precise. The constants in the equations for the expected return never vary from zero. This result attests to the validity of the CAPM, as significant constants contradict the CAPM. The strong heteroscedasticity is expressed in all five cases by the coefficients in H_t, which differ from zero. We use the individual equations to analyze in depth the results on the conditional variances. Since Eastern European securities have rarely been the subject of empirical studies so far, we selected the components of the conditional covariance matrix for Eastern Europe/world:

(6.1) $\quad h_{mt} = \; 5.23e-6 + 0.9582 \; h_{mt-1} + 0.0299 \; u^2_{mt-1},$

(6.2) $\quad h_{imt} = \; 2.85e-11 + 0.8886 \; h_{imt-1} + 0.0699 \; u_{mt-1}u_{it-1},$

(6.3) $\quad h_{it} = \; 2.63e-6 + 0.8226 \; h_{it-1} + 0.1632 \; u^2_{it-1}.$

The coefficient stating the impact of yesterday's variance is markedly greater than that for yesterday's squared innovations. This observation applies to all five indices and has been confirmed in many papers on univariate volatilities. In the RiskMetrics approach these values were set a

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1   *See section 3.1 in Campbell et al. (1996).*

priori at 0.94 and 0.06. The above equations show that this study's results differ from such values. The difference is particularly large in the case of the variance observed for the Eastern European securities. Another essential characteristic of conditional volatilities is their persistence, that is how long a shock impacts the variance. The model at hand measures persistence as $a_{ii}^2 + b_{ii}^2$. The sum of the coefficients in the variances is close to 1, which indicates a very high persistence. In other words, it takes several months for the impact of a shock to fade. Interestingly, though, none of the sums exceeds 1. If it were, variance would be explosive. Covariance shows a lower persistence than the variances.

These results can best be compared to the paper by De Santis und Gerard (1997), which studies a multivariate GARCH model for monthly MSCI excess returns from the period 1970 to 1994. De Santis and Gerard likewise assume unhedged exchange rate risks, but use the U.S. dollar as base currency. All in all, the results are very similar. This study, for instance, documents an insignificant parameter g set at 2.37, and the coefficients of the conditional covariance matrix are also of a similar size.

3.2 Testing of the Model

Upon estimation, the model is tested for its fit with the data available. For one thing, the model should reproduce as many statistical properties of the time series underlying the estimation as possible. Most importantly, a market risk model must capture the dynamic pattern of the variance correctly. To verify compliance with this requirement, tests on the raw data, i.e. the squared returns, are compared with the outcome of the square values of the standardized residuals[1]). Provided the right specification was selected, these series should no longer turn out to be heteroscedastic. Table 3 shows the results of the Q tests of the squared residuals of the five bivariate models. All values are markedly below those given in table 1. Of the ten series, only one shows slight signs of time-dependent volatility. This means that the GARCH approach chosen succeeds in modeling fully the dynamic pattern of the variances in nine out of ten cases. Thus, this model provides a complete picture of the behavior of time-varying variance and adequately captures risk by econometric standards.

To investigate the robustness of the model further, we estimated two alternative specifications: first, a version accounting for the autocorrelation in the returns, and second, the residual risk model. Under the first approach, linear dependence in the price changes was eliminated by means of autoregressions.[2]) This approach was chosen because of the high autocorrelation documented in table 1. The interval effect is in part ascribable to this dependence. The coefficient estimates generated by this modified model were very similar to the values given in table 2. Above all, the parameters in the H_t covariance matrix did not show any discernible differences. Therefore, consideration of the autocorrelation did not produce

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1   Defined as $\varepsilon_{it} = u_{it}/\sqrt{h_{it}}$.

2   AR(12) was used for pre-whitening.

diverging results. The second alternative specification defines the equation for excess returns as follows:

$$(7) \qquad R_{it} = m_{12} + g_1{}^* h_{imt} + g_2{}^* h_{it} + u_{it}.$$

In this model, the expected value of the return is determined not only by the covariance with the international portfolio, but also by its own variance. This means that the capital market under study is not fully integrated, as it shows a certain degree of segmentation, which is reflected in the relationship with the own variance. The last row of table 3 contains the outcome of a Wald test in accordance with the above specification. It is evident that the alternative specification dominates the initial model only once, namely for the price changes of the North American shares. North America, notably the U.S.A., is the most important financial market, which is why it influences all other exchanges greatly. Transmission effects to the North American market are considerably lower.[1] It comes as no surprise, then, that the own variance has a greater impact in this case than the covariance with the world portfolio comprising all markets. By extension, this means that the European financial markets (represented by the EMU series) are integrated into the international capital market and local shocks are of minor importance. In the data set at hand, the results are affected somewhat by the Russian financial crisis of August 1998. The following section analyzes in depth the behavior of the beta factors and of the volatilities, highlighting especially the Russian crisis.

3.3 Analysis of the Betas, Volatilities and the VaR

The means and extreme values of the betas and volatilities listed in table 4 help analyze the betas and volatilities over time. Both the betas and the variances are subject to considerable fluctuations. Particularly important observations may be derived from examining the risk measures pertaining to the price changes in Eastern Europe (chart 1 and chart 2). The effects of the crisis which spilled over from Southeast Asia to Russia, where it culminated in August 1998 in the depreciation of the ruble, are clearly discernible. Beta and variance were relatively low up until November 1997, fluctuating only marginally. Yet, once the financial crisis hit Asia, the risk measures displayed a pronounced uptrend. While beta averaged around 1, the maximum stood at 3.9, as measured on September 1, 1998. The high value remained in place, except for a temporary dip sending the covariance into negative. In the same vein, the volatilities distinctly reflect the impact of the Russian crisis. Like beta, volatility peaked on September 1, 1998, at an annualized 124%. Furthermore, the variance of the world portfolio increased perceptibly. Given diversification effects, the increase was, however, less steep than that observed for the regional series. All told, the crisis in the emerging markets increased risk markedly not just in Eastern Europe, but in the world in general. Let us take a look at the REX bond index. Table 4 shows that the beta of the bond portfolio, i.e. the covariance,

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1   Peiro et al. (1998) show that New York is hardly influenced by other markets.

turned negative at several points in time, namely during the summer and fall of 1998. The returns on bonds moved upwards, while those on stocks declined. This development underlines the observation that investors turned to safe investments when prices fluctuated wildly. Government bonds fared well, not least owing to their liquidity. The flight to quality in the euro area particulary boosted demand for German bonds. Except for the Eastern European securities, the beta extremes did not diverge too far from the average. Put differently, while risk varied, no significant gyrations were evident. This observation is not valid for Eastern Europe, as beta displays extreme movements in this region. The behavior of this risk measure is a further pointer to the immense risk inherent in investments in transition countries. Unconditional beta or the mean of conditional beta are therefore meaningful only to a certain degree, which is why it is necessary to analyze the data over the entire observation period.

The variance given for MSCI Eastern Europe (chart 2) is used to compute the VaR. The portfolio is assumed to have an initial value of 1,000 and to develop in sync with the index. The forecast horizon is one day at a 95% percentile. Using the daily GARCH volatility and the portfolio value, the VaR is therefore defined as follows:[1]

$$(8) \qquad VaR = P_t^* 1.65^* \sqrt{h_{it}}.$$

Chart 3 depicts the VaR together with the gains and losses of the underlying portfolio. The GARCH model plots the actual market risk development rather well. A total of 1,160 observations displays 41 outliers. In other words, on 41 days (3.5%) the actual loss of the Eastern European portfolio exceeds the figure forecast by the VaR concept based on the GARCH volatility. The Kupiec test[2] (1995) shows that this percentage of outliers differs significantly from 5%. The GARCH model thus meets the requirements of the market risk concept, as the regulatory capital requirement is sufficient to cover losses acutally realized. Indeed, it is a rather conservative measure, lying 1½ percentage points below the critical threshold.

3.4 Covariance Forecasting

Let us now turn to the predictive quality of the model. The covariance forecasts for the Eastern European/world portfolio and the euro area/world portfolio via the multivariate GARCH model[3] are compared to those using the RiskMetrics approach. Here, the covariance between series i and the world portfolio is calculated according to the equation:

$$(9) \qquad h_{imt} = 0.94 \, h_{imt-1} + 0.06 \, u_{mt-1} \, u_{it-1}.$$

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1   For details on VaR, see Jorion (1997).

2   This test compares the likelihood at 3.5 and 5%, respectively. The test statistic is Chi square (1) distributed.

3   As the coefficients are very stable, the values given in table 2 are used.

Chart 4 presents the resulting covariances between Eastern Europe and the world portfolio. EWMA and GARCH obviously yield very similar results. Nevertheless, there are several periods for which the two approaches produce diverging outcomes. The first two rows of table 5 state the means and standard deviations of the forecast covariances between Eastern Europe and EMU, respectively, and the world portfolio. The results differ in two aspects: The means of the GARCH forecast are lower for both return series than those computed by the EWMA model. Likewise, the standard deviation according to GARCH is lower. This means that, on average, the two approaches predict different covariances and that the EWMA covariance shows higher fluctuations. The disparity between the two models is greater for the covariance Eastern Europe/world than for EMU/world.

Literature on covariance forecasting is scarce compared to studies on variance forecasts.[1] To measure the predictive quality of the covariances, two criteria widely used for variance forecasting come in: the root mean squared error (RMSE) and the regression-based method. RMSE is defined as:

$$(10) \qquad RMSE = \left[\frac{1}{n} \sum_{t=1}^{n} (h_{imt} - v_{imt})^2 \right]^{0.5},$$

with:

h_{imt} forecast covariance (GARCH or EWMA)
v_{imt} realized covariance.

The realized covariance corresponds to the product of the mean-adjusted returns. It becomes evident that the mean squared error sums the variance and the squared bias of the forecasting method. The bias represents the systematic error, i.e. the deviation from the estimates of the expected value ("true value"). The variance of a forecasting method serves as an indicator of its efficiency, or the dispersion of the estimates around the expected value. The model displaying the smallest RMSE is the best. A downside of this criterion: When the values rendered by both methods hardly diverge, it is difficult to arrive at conclusions. In such a case it is unclear which model predominates. For this reason, a second criterion is introduced; the realized covariance is regressed to a constant and the forecast:

$$(11) \qquad v_{imt} = c_0 + c_1 \ h_{imt} + e_t.$$

The estimation of the above equation is based on the least square method.[2] Provided the forecast is not distorted, the constant should equal zero and the slope 1. The t statistics of the regression coefficients serve to verify these hypotheses. In addition, the measures of determination (R^2) are used to rank the models according to their predictive quality. For the

1   *See Pagan and Schwert (1990), Heynen and Kat (1994) or Kroner (1996).*
2   *The estimation error is calculated according to White (1980).*

outcome of these two criteria, see table 5. Hardly any differences are discernible with the root mean squared error. In both cases the values are so close that it is not feasible to declare any one model dominant. However, the regression results are distinct from one another. With the Exponentially Weighted Moving Average model there is clear evidence of a systematic error. In both time series the constants are not zero, and for Eastern Europe/world the slope differs significantly from 1. By contrast, the GARCH method reveals no signs of such a distortion. Both constants are near zero, and the slopes near one. The measures of determination are very close, too, albeit the EWMA leading by a slight margin. With the covariance of Eastern Europe/world, about 6% of the daily fluctuations in realization are explained, with EMU/world, this percentage runs to some 10%.

In sum, neither model produces highly efficient forecasts. For the two criteria, RMSE and R^2, both methods yield very similar results. The key difference concerns the fact that EWMA shows a systematic forecasting error nonexistent in GARCH. Therefore, GARCH renders better forecasts than EWMA.

4 Concluding Remarks

This study examined the risk of international securities portfolios based on econometric methods. The data set used contained daily price changes of four regional MSCI stock indices and the REX bond index to capture the most important securities categories. Included was an index tracking Eastern European shares, because the risk behavior of this market has rarely been researched before. The results corroborate the two key regularities, nonnormality of the distribution and time dependence of the variances, for all time series. The estimation of the International CAPM relied on a GARCH structure. The risk inherent in the assets observed varies over time and is illustrated adequately by the covariances. The fluctuations are most striking with Eastern European shares. The findings revealed that the Russian crisis led to a sustained increase in the risk measures examined on international capital markets. The multivariate GARCH model reproduced the time dependence of the variances for nine out of ten cases. An evaluation of the model's compliance with risk management requirements underscores the performance of the specification, as the estimated VaR renders a correct picture of actual losses. Covariance forecasting marked the final step of the empirical research. Underlying the assessment of the predictive quality of the models were two criteria. It was shown that the GARCH covariance did not have a systematic forecasting error.

In the light of these findings a CAPM with a multivariate GARCH component seems fit for measuring the market risk to calculate the regulatory capital requirement. Such a model complies with the empirical regularities and is capable of capturing time-dependent risk in an adequate manner. Moreover, it outperforms the alternative specification (EWMA) in forecasting covariances.

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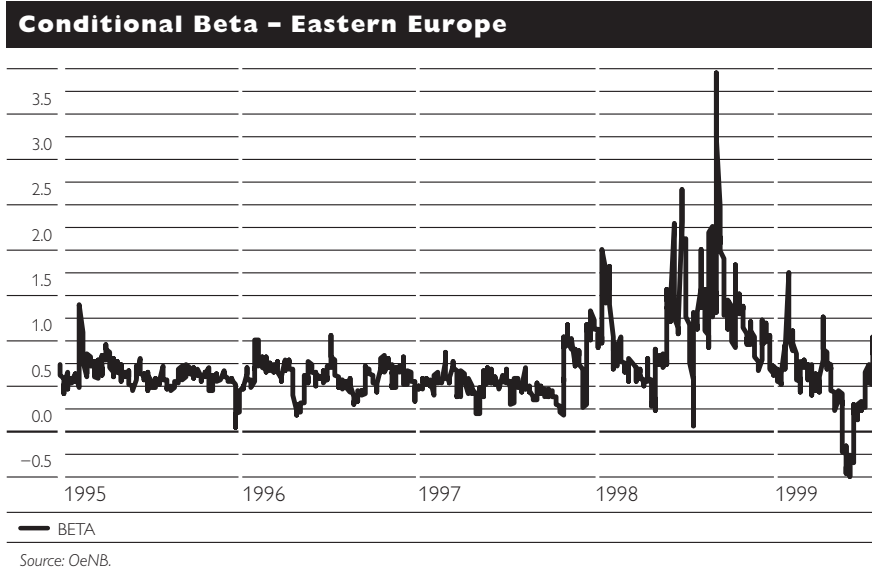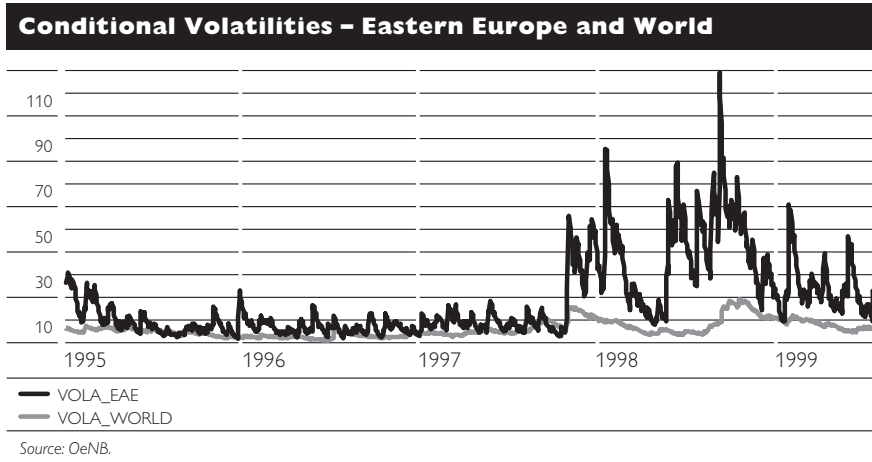
Chart 1

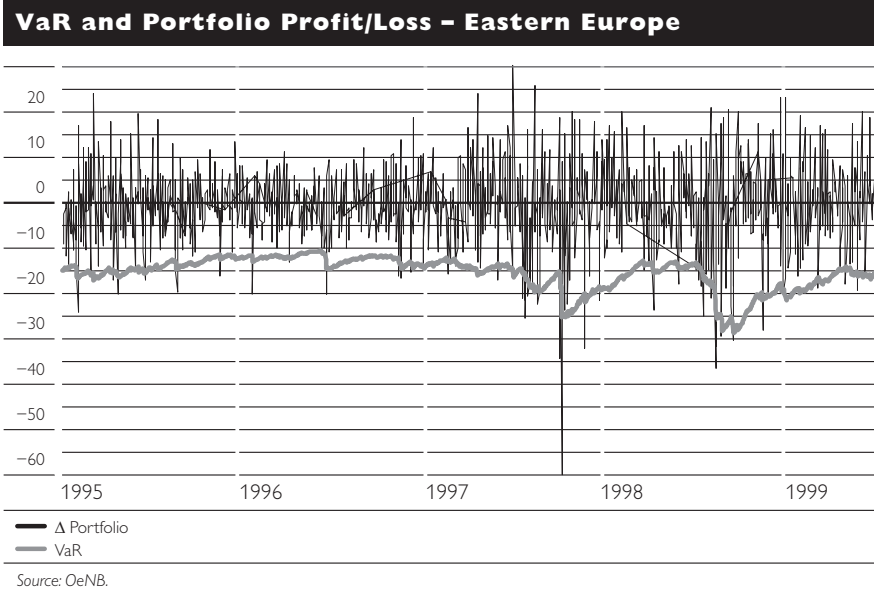## Conditional Beta – Eastern Europe

Source: OeNB.

Chart 2

Conditional Volatilities – Eastern Europe and World

Source: OeNB.

Chart 3

VaR and Portfolio Profit/Loss – Eastern Europe

- Δ Portfolio
- VaR

Source: OeNB.

Chart 4

Covariances – Eastern Europe/World

- COV_EWMA
- COV_GARCH

Source: OeNB.
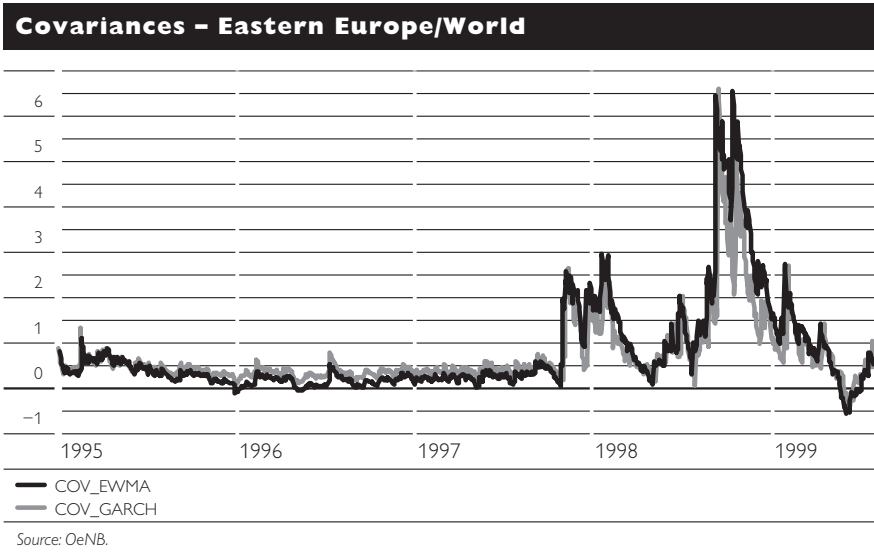
Table 1

Statistical Properties of Returns

	Eastern Europe	Euro area	North America	Asia Pacific	REX	World
Mean (% p. a.)	− 6.98	15.96	23.32	− 2.42	−0.55	15.06
Minimum (%)	−16.008	− 5.578	− 8.3321	− 5.054	−1.198	− 5.96
Maximum (%)	+ 9.398	+ 5.5771	+ 4.6905	+10.106	+0.807	3.5
Volatility (% p. a.)	31.03	16.99	19.68	21.6	3.2	15.47
Skewness	−1.071459[1]	−0.506370[1]	−0.573389[1]	0.406733[1]	−0.686091[1]	−0.545624[1]
Kurtosis	8.56820 [1]	4.443201[1]	3.507036[1]	4.714538[1]	3.087874[1]	2.925021[1]
Jarque-Bera test	3,858.058[1]	1,027.135[1]	673.3455[1]	1,132.032[1]	564.7078[1]	482.0492[1]
Q(12) r(t)	80.60[1]	46.96[1]	18.55[1]	42.14[1]	14.35[1]	43.70[1]
Q(24) r(t)	117.82[1]	96.87[1]	32.29[1]	54.32[1]	39.26[1]	57.85[1]
Q(12) r^2(t)	338.94[1]	690.84[1]	132.35[1]	172.04[1]	85.03[1]	207.22[1]
Q(24) r^2(t)	551.31[1]	1,125.37[1]	175.82[1]	312.23[1]	120.10[1]	329.77[1]

Source: OeNB.
[1] *The test rejects the null hypothesis at a significance level of 1%.*

Table 2

Results of the Dynamic CAPM[1]

$$R_{mt} = m_{11} + g^* h_{mt} + u_{mt} \qquad R_{it} = m_{12} + g^* h_{imt} + u_{it}$$

$$u_t | I_{t-1} \sim N(0, H_t)$$

$$H_t = C'C + A' H_{t-1} A + B' u'_{t-1} u'_{t-1} B$$

	Eastern Europe	Euro area	North America	Asia Pacific	REX
m11	**0.0009425**	**0.0001108**	**0.001013**	**0.0005096**	**0.00072762**
	0.000615	0.0004913	0.00079	0.0005219	0.00050979
m21	**0.0010679**[2]	**0.0003877**	**0.001642**	**−0.0000478**	**0.00002016**
	0.000494	0.0003355	0.00097	0.0005079	0.00005759
g	**−0.4282963**	**8.1253565**	**3.480659**	**4.3259885**	**1.92819154**
	7.361794	6.0974407	8.80315	6.2927211	6.32754664
c11	**0.0010153**[2]	**0.0011386**[2]	**0.003512**[2]	**0.0009590**[2]	**0.00080077**[2]
	0.000146	0.0001770	0.00023	0.0001697	0.00017143
c12	**0.0020250**[2]	**0.0004647**[2]	**0.006535**[2]	**0.0007191**[2]	**0.00013526**
	0.000390	0.0000856	0.00049	0.0001317	0.00007990
c22	**0.0016230**[2]	**−0.0006232**[2]	**0.000001**	**0.0006680**[2]	**0.00062406**[2]
	0.000344	0.0000761	5.14400	0.0001512	0.00004287
a11	**0.9789046**[2]	**0.9671962**[2]	**0.887122**[2]	**0.9730281**[2]	**0.97635865**[2]
	0.002721	0.0044240	0.01387	0.0038958	0.00357175
a22	**0.9078394**[2]	**0.9745919**[2]	**0.770235**[2]	**0.9752688**[2]	**0.88904783**[2]
	0.007346	0.002395	0.02179	0.0030974	0.01061592
b11	**0.1730297**[2]	**0.2261926**[2]	**0.284878**[2]	**0.2129846**[2]	**0.20115113**[2]
	0.010613	0.0141180	0.02520	0.0137053	0.01427562
b22	**0.4041617**[2]	**0.2100573**[2]	**0.402162**[2]	**0.2130156**[2]	**0.33700976**[2]
	0.014990	0.0110320	0.02715	0.0132428	0.02377641

Source: OeNB.
[1] *The table shows the estimated coefficients (bold) and the associated standard errors.*
[2] *The test rejects the null hypothesis at a significance level of 1%.*

Table 3

Tests of the Dynamic CAPM

	Eastern Europe	Euro area	North America	Asia Pacific	REX
Standardized residuals					
Q(24) e_{it}^2	32.47	23.83	47.68 [1]	24.75	25.16
Q(24) e_{mt}^2	21.07	41.71	25.77	19.19	21.77
Wald test					
Own variance	0.4822	0.4782	7.1728[1]	0.8816	3.3817

Source: OeNB.
[1] This test rejects the null hypothesis at a significance level of 1%.

Table 4

Betas and Volatilities of the Dynamic CAPM

	Eastern Europe	Euro area	North America	Asia Pacific	REX
Minimum beta	− 0.5198	0.2177	0.931	0.3457	−0.079
Mean beta	0.69263	0.6172	1.129	0.838	0.026
Maximum beta	3.9267	1.1817	1.739	1.33	0.2195
Minimum volatility	11.515	8.1269	16.4712	11.82	2.137
Mean volatility	27.262	15.5858	19.85	20.95	3.1578
Maximum volatility	124.977	43.132	41.89	46.34	6.329

Source: OeNB.

Table 5

Results of Covariance Forecasting

	Eastern Europe/world		Euro area/world	
	EWMA	GARCH	EWMA	GARCH
Mean covariance (*10,000)	0.8462	0.7172	0.6765	0.6535
Standard deviation (*10,000)	1.12	0.7974	0.7930	0.6505
RMSE (*10,000)	3.24635	3.24859	1.86834	1.86504
Regression results				
Constant (*10,000)	0.2166[1]	0.1355	0.115 [1]	0.0185
Slope	0.7482[2]	0.9958	0.8322[2]	1.0090
R^2	0.0628	0.0560	0.1105	0.1093

Source: OeNB.
[1] The t test rejects the null hypothesis constant = 0 at a significance level of 1%.
[2] The t test rejects the null hypothesis slope = 1 at a significance level of 1%.

Calculating the Thresholds for the Notification of Mergers of Banks – The New Legal Situation

Dieter Duursma,
Henriette-Christine
Kepplinger[1])

The host of major bank mergers as well as banks' acquisitions of holdings in nonbanks to enhance their market position have caused industrial analysts to frequently denounce this development as "takeover fever" or "merger mania".[2]) A variety of rules applies to mergers: Economic, tax and company law regulations as well as cartel law provisions related to merger control both at the Community level (Council Regulation on the control of concentrations between undertakings[3]) and at the national level (Articles 41 et seq. Cartel Act – Kartellgesetz[4])). Although notified concentrations between undertakings are prohibited only rarely and then to prevent undertakings from creating or strengthening a dominant position in the market, the regulations on merger control are of great practical importance. Since merger control under EC law is construed as a preventive control instrument, a concentration can be put into effect only after having been declared compatible with the Common Market (Article 7 (1) Merger Regulation). A notification calls for certain information to be provided in accordance with Form CO.[5]) In the event of intentionally or negligently incorrect or misleading information or wherever a concentration is carried out in breach of the applicable provisions or decisions, the Commission may impose fines (Article 14 (1) and (2) Merger Regulation). Of particular relevance to Austrian merger control law is the nullity provision as laid down in Article 42 a para 4 Cartel Act, if a concentration subject to notification is put into effect without the confirmation of the Cartel Court in accordance with Article 42 b paras 1 and 5 Cartel Act or in breach of a prohibition or decision pursuant to Article 42 b paras 3 to 5 Cartel Act.

However, not all concentrations between undertakings constitute a notifiable merger or are prohibited from being carried out. Generally, an appraisal has to be made as to whether a concentration in the legal sense of the term exists[6]), and the aggregate turnover of the undertakings concerned must reach a specified dimension in order to trigger an examination under competition law rules by the merger control authority.

1 Notification Thresholds

The thresholds for the notification of mergers are instrumental to examine concentrations from a competition law perspective. The notification thresholds relate to the turnover – for banks, the sum of certain income

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1   Dieter Duursma – Johannes Kepler University Linz; Henriette Kepplinger – Landesgericht Linz. The opinions expressed by the authors in this study do not necessarily reflect those of the OeNB.

2   See, e.g., "Gemischte Reaktionen auf die Banken-Fusionen in Amerika" in the Frankfurter Allgemeine Zeitung dated April 15, 1998, as well as the article "Was trotz des Übernahmefiebers nie außer acht gelassen werden sollte" by Kreuz and Diedrichs in the Frankfurter Allgemeine Zeitung dated December 21, 1998, p. 29.

3   Official Journal (OJ) L 395/1, 30. 12. 1989, as amended by OJ L 180/1, 9. 7. 1997, hereinafter called Merger Regulation. As regards the amendment, see Matousek (1997), pp. 854ff.

4   Federal Law Gazette (BGBl) No. 1988/600 as amended by Federal Law Gazette Part I No. 1999/126. As regards the new rules in the area of merger control contained in the applicable 1999 Amendment to the Cartel Act, which took effect on January 1, 2000, see Barbist and Rungg (2000), pp. 51ff.

5   Annex to OJ L 61/1, 2. 3. 1998.

6   See Gugerbauer (1995), Handbuch, Article 3 Merger Regulation, paragraphs 1 et seq.; (1995) Handbuch, Article 41 Cartel Act, paragraphs 5 et seq.; (1993), pp. 751ff; Wessely (1995), Medienfusionskontrolle, pp. 28ff; Duursma (1999), pp. 53ff.

items (see Chapter 2) – of the undertakings concerned and of their affiliated undertakings. This ensures, on the one hand, a certain practicability (and thus efficiency and legal security) for the undertakings concerned; on the other hand, the rigid thresholds are frequently unable to give a fair picture of prevailing market conditions, which a market share criterion, however it may be defined, is likely to provide.

1.1 Merger Regulation Thresholds

Pursuant to Article 1 Merger Regulation, a notification requirement applies to all concentrations with a *Community dimension*. This condition has to be checked on the basis of the criteria set out in Article 1 (2) Merger Regulation: The *aggregate worldwide turnover* of all the undertakings concerned must be more than *ECU (EUR) 5,000 million,* with at least two of the undertakings concerned having a *Community-wide turnover* of more than *ECU (EUR) 250 million* each, unless each of the undertakings concerned achieves more than *two thirds*[1]*)* of its aggregate Community-wide turnover within one and the same Member State. Under this two-thirds provision, concentrations with an impact on the market of only one Member State are exempt from the Merger Regulation and – in line with the subsidiarity principle – are subject to the competent national cartel authority.

In cases where the undertakings concerned do not meet the thresholds laid down in Article 1 (2) Merger Regulation, a Community dimension is assumed under the conditions set out in Article 1 (3) Merger Regulation if the concentration affects three or more Member States and triggers national merger control proceedings depending on the laws of that member state. This residual responsibility of the EU Commission is designed to prevent multiple notifications, establishing a centralized procedure in Brussels instead.

1.2 Cartel Act Thresholds

The amended § 42 a para 1 Cartel Act now provides for three thresholds instead of the previous two (which, moreover, have been increased). A concentration is considered notifiable if, first of all, the undertakings concerned had a combined aggregate *worldwide* turnover of more than *ATS 4.2 billion* in the business year preceding the concentration (the national market on which the turnover is registered is therefore of no relevance). The provision constitutes a correction and clarification of the established practice of the Appellate Cartel Court[2]*)*, which was based on the domestic turnover. The second threshold is the *domestic* turnover of all undertakings involved, which must reach an aggregate amount of *ATS 210 million*. This stipulation serves the objective of the Cartel Act – i.e. to protect the Austrian market against competitive distortions – and is moreover intended to provide the necessary domestic context. As a *de minimis* threshold for the

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1   For examples of the application of the two-thirds rule, see Guidance Note III of the Commission, OJ
    C 377/27, 1994.
2   Kartellobergericht (KOG) ecolex 1997, p. 172 = ÖBl (Österreichische Blätter für gewerblichen Rechtsschutz
    und Urheberrecht) 1997, p. 185; KOG ÖBl 1998, p. 206.

size of the undertakings involved, item 3 stipulates that at least two of them must have a *worldwide* turnover of *ATS 28 million* each. Hence, the notification requirement for concentrations between undertakings that recorded an aggregate combined turnover of *ATS 150 million* but were below the notification requirement of Article 42 a para 1 Cartel Act is no longer applicable.

In determining the thresholds, Austrian legislators took into account the envisaged adoption of a Second Euro-Related Amendment to Civil Legislation, which will provide for the conversion of all schilling amounts laid down in Austrian civil legislation into euro as of January 1, 2002: All amounts can be divided by 14; the schilling thresholds will be replaced by the "rounded" euro amounts of EUR 300 million, EUR 15 million and EUR 2 million.

2 Turnover Proxy for Banks

Since turnover is not suited as a quantitative indicator of the economic power of a bank, both the Merger Regulation (Article 5 (3) (a)) and the Cartel Act (Article 2 a item 2) contain special provisions for the calculation of the notification thresholds.

2.1 Scope of Application

Article 5 (3) (a) Merger Regulation provides for a specific threshold to be calculated for credit institutions and other financial institutions.[1] *Credit institutions* are all undertakings whose business is to receive deposits or other repayable funds from the public and to grant credits for their own account.[2] Pursuant to Article 2 of the First Banking Coordination Directive, the directive does not apply to central banks of the Member States, post office giro institutions and specifically listed institutions of the Member States. *Financial institutions* are all undertakings that do not meet the requirements for credit institutions laid down in the First Banking Coordination Directive and the principal activity of which is to acquire holdings or to carry on one or more of the activities listed in points 2 to 12[3] in the Annex[4]. Leasing enterprises are considered financial institutions insofar as a lending function is inherent in the leasing transactions (financial leasing) – i.e. the lessee is given the possibility to acquire an asset at a

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1   *See Axter and Scherer (1991), pp. 246ff; Ratliff and Garner (1991), p. 232.*

2   *Article 1 of the First Council Directive of 12 December 1977 on the coordination of laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions (77/780/EEC), OJ L 322/30, 17. 12. 1977.*

3   *This comprises lending, financial leasing, money transmission services, issuing and administering means of payment (credit cards, travelers' checks and bankers' drafts), guarantees and commitments, trading for own account or for account of customers (in money market instruments and others), participation in securities issues and the provision of services related to such issues, advice to undertakings (on capital structure, industrial strategy, mergers, purchase of undertakings), money broking in the interbank market, portfolio management and advice, safekeeping and administration of securities.*

4   *See Article 1 (6) of the Second Council Directive of 15 December 1989 on the coordination of laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions and amending Directive 77/780 EEC (89/646/EEC), OJ L 386/1, 30. 12. 1989.*

moderate price after the leasing contract has expired. Operating leasing transactions, by contrast, are not covered.

Article 2 a item 2 Cartel Act lists credit institutions and building and loan assocations as bodies to which the regulation applies. Within the framework of the Financial Market Adaptation Act (Finanzmarktanpassungs-gesetz)[1]), Article 104 Banking Act provided for the replacement of the term "bank" by "credit institution" in the Cartel Act. Consequently, it may be useful to rely on the definition of Article 1 para 1 Banking Act in a first step. In terms of classification, this enumeration of banking activities is a combination of the list in the former Credit System Act (Kreditwesenge-setz) and of the aforementioned Annex to the Second Banking Coordination Directive. It is interesting to note, however, that the term credit institution is used with different connotations in the Banking Act itself.[2]) In calculating the turnover pursuant to Article 2 a item 2 Cartel Act, it should therefore be taken into account that this provision is designed to give an adequate picture of the market position of undertakings that are typical investors. Profits do not result from a quid pro quo, but from their further application in additional business.

2.2 Revised Calculation Method for Thresholds

The previously applicable regulation relied on a specific percentage of total assets instead of the turnover thresholds, which gave rise to considerable practical problems, as a threshold calculated on the basis of total assets excludes certain transactions (e.g. income from foreign exchange and securities trading). Problems also arose in connection with the necessary geographical breakdown of banks' turnover (aggregate Community-wide turnover, two-thirds rule), which was based on the domicile of the customer. Identifying the domicile of a borrower proved difficult and time-consuming for the banks – among other reasons, because the domicile may change during the life of a credit. Since delays in notifications often occurred, the European Commission, by way of an exception, did not impose fines when delays were due to such complications.[3])

Art 5 (3) (a) Merger Regulation, which was modified by the 1997 Amendment, now provides for the *sum* of certain income items as defined in Council Directive 86/635/EEC (Bank Accounts Directive – Articles 29 to 32)[4]) to serve as *turnover proxy* in calculating thresholds for credit and other financial institutions. This calculation method was also introduced in Austrian law in the amended Article 2 a item 2 Cartel Act[5]), as this

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1   Federal Law Gazette (BGBl) No. 1993/532.

2   In addition to Article 1 para 1, see, e.g., Article 2 item 13, Article 2 item 20, Article 2 item 21 as well as Article 9 para 1 Banking Act.

3   See European Commission dated February 24, 1992, "Torras/Sarrio", paragraph 3, WuW (Wirtschaft und Wettbewerb)/E EV 1817 = WuW 1992, p. 689.

4   Council Directive of 8 December 1986 on the annual accounts and consolidated accounts of banks and other financial institutions (86/635/EEC), OJ L 372/1, 31. 12. 1986.

5   Federal Law Gazette (BGBl) Part I No. 1999/126; see also similar revisions made by German legislation under the 6th Amendment to the Cartel Act (6. GWB-Novelle; Bundestagsdrucksache – Parliamentary bill – no. 418/98) in Article 38 para 4.

approach reflects better the "economic situation of the banking sector."[1])
The income items to be added up in determining the thresholds are now as
follows:

a) *Interest receivable and similar income:* Article 29 Bank Accounts Directive
   provides a detailed list of the elements of interest receivable. This
   includes in particular:

   – All income from: cash in hand, balances with central banks and
     post office banks; Treasury bills and other bills eligible for
     refinancing with central banks; loans and advances to credit
     institutions; loans and advances to customers; debt securities
     including fixed-income securities (regardless of the method of
     calculation). Such income also includes income arising from the
     spreading on a time basis of the discount on assets acquired at an
     amount below, and liabilities contracted at an amount above, the
     sum payable at maturity;

   – income resulting from covered forward contracts, spread over the
     actual duration of the contract and similar in nature to interest;

   – fees and commission similar in nature to interest and calculated on a
     time basis or by reference to the amount of the claim or liability.

b) *Income from securities:* This item comprises all dividends and income from
   shares and other variable-yield securities; participating interests; shares
   in affiliated undertakings (Article 30 Bank Accounts Directive).

c) *Commissions receivable:* Commissions receivable include income in respect
   of all services supplied to third parties, in particular: commissions for
   guarantees, loans administration on behalf of other lenders and
   securities transactions on behalf of third parties; commissions and
   other income in respect of payment transactions, account administration
   charges and commissions for the safe custody and administration of
   securities; commissions for foreign currency transactions and for the
   sale and purchase of coin and precious metals on behalf of third parties;
   commissions charged for brokerage services in connection with savings
   and insurance contracts and loans (Article 31 Bank Accounts Directive).

d) *Net profit on financial operations:* This item covers the net profit on
   transactions in securities included in a trading portfolio; the net profit
   on exchange activities; the net profits on other buying and sellings
   operations involving financial instruments – such as precious metals
   (Article 32 Bank Accounts Directive).

e) *Other operating income:* This represents a residual item for all other
   income resulting from the ordinary activities of credit institutions, in
   particular cash surpluses, book profits from sales of fixed assets, income
   from non-banking services, and income from leasing business.

In order to obtain a gross turnover figure, debt interest and similar
expenses as well as commissions and net losses arising from financial
transactions are not deducted from the sum of these items. By contrast,
value added tax and other taxes directly related to such types of income are

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1 *Travaux préparatoires of the government bill on the 1999 Amendment to the Cartel Act, published in the
stenographic minutes of the Austrian Parliament (1775 BlgNR XX. GP, p. 7).*

to be deducted, where appropriate (Article 5 (3) (a) Merger Regulation). Although credit institutions' services are not subject to taxation, the need for regulation was underlined due to banks' options with regard to turnover tax liability. Since the Cartel Act lacks such a provision, Gugerbauer assumes that only turnover tax needs to be deducted in the case of a turnover tax liability.[1]) Extraordinary income or profit is not included in the calculation, because it does not fall under the heading ordinary activities of undertakings and therefore provides a distorted picture of the actual market position.

The 1997 Amendment to the Merger Regulation has greatly facilitated the *geographical breakdown* of credit institutions. The income is no longer allocated to the (business) domicile of the customer but rather exclusively to the *domicile of the bank* or bank division (Article 5 (3) (a) last sentence Merger Regulation) where the income was received. This means that the classification of interbank loans will from now on also be based on the location of the branch of the bank granting the loan. Previously, turnover in such cases had been traced to the borrower's establishment that actually made use of the loan, because this is where the funds were used as an economic resource.[2]) The geographical breakdown has also become necessary for the calculation of the notification thresholds under the Cartel Act, which differentiates between domestic and worldwide turnover. The Cartel Act does not provide for a regulation similar to Article 5 (3) (a) last sentence Merger Regulation. It may be assumed, however – in view of the fact that Article 2 a item 2 Cartel Act is generally in line with the relevant provision of the Merger Regulation and due to the comment made in the travaux préparatoires that the geographical breakdown is to be "facilitated" as a result of the shift to bank income types[3]) – that the domicile of the bank is again the decisive factor.

3 Calculation of Notification Thresholds

Since the thresholds are designed to assess whether concentrations fall under competition law, the turnover/income values of the *undertakings concerned* along with those of their *affiliated undertakings* must be used.[4]) The reason for the introduction of a special method for calculating the thresholds applicable to banks was to ensure the comparability with the turnover of other economic agents and thus to provide the possibility of an *addition* of the relevant values for concentrations between credit institutions and other undertakings *(mixed conglomerates)*. For financial holding companies[5]), e.g., the turnover is principally to be calculated according to the special rules applying to credit and other financial institutions. Since the main business

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1   See Gugerbauer (1995), Handbuch, Article 42 Cartel Act, paragraph 10.

2   See European Commission dated 21 May 1992, "Hongkong and Shanghai Bank/Midland", paragraph 10, WuW/E EV 1863 = WuW 1992, p. 1075; thus the domicile of the borrowing institution was not decisive (contrary to the general allocation rule).

3   Travaux préparatoires of the government bill on the 1999 Amendment to the Cartel Act, published in the stenographic minutes of the Austrian Parliament (1775 BlgNR XX. GP, p. 7).

4   See Duursma (1999), pp. 36ff.

5   See the Commission notice on calculation of turnover, paragraphs 59 et seq.

purpose of a financial holding company consists in acquiring (a stake in) other undertakings, however, the aggregate turnover of affiliated undertakings – e.g. of an industrial enterprise – has to be included. Dividends and other income paid out by these undertakings to the financial holding company are to be deducted. In calculating these figures, it should be borne in mind that different accounting regulations apply in different Member States because the rules for the preparation of consolidated accounts have not been fully harmonized across the Community.

3.1 Relevant Undertakings

a) Undertakings concerned

Whether an undertaking constitutes, from the legal viewpoint, an undertaking concerned depends on the individual concentration case. For a merger (or acquisition of a stake), the aggregate turnovers of the *buyer* and of the *undertaking acquired* are basically to be recorded as those of undertakings initially concerned. The seller, by contrast, is not involved in the concentration,[1]) because he has no powers whatsoever over the undertaking sold once the transaction has been completed. His turnover is therefore not to be taken into account – unless it is to be considered on the grounds of an affiliation pursuant to Article 5 (4) Merger Regulation or Article 2 a Cartel Act (see section b). As a result, whenever *parts of an undertaking* are acquired, only the turnover of these parts has to be taken into account (the turnover of other parts of the seller are irrelevant).[2]) In order to avoid circumventing merger control regulations by completing a concentration "by instalments," Article 5 (2) last sentence Merger Regulation provides for the addition of turnovers in the case of two or more transactions between the same persons or undertakings within a two-year period, i.e. it is assumed that "one and the same concentration"[3]) took place on the date of the last transaction. The Cartel Act, by contrast, does not contain such a provision.

b) Affiliated undertakings

Apart from the turnovers of the initially concerned undertakings, the aggregate group turnover must also be considered in calculating the notification thresholds (Article 5 (4) Merger Regulation; Article 2 a Cartel Act). Hence, the turnovers of subsidiaries, parent and sister companies as well as third-party undertakings in which the aforementioned undertakings ointly have rights or powers ("joint venture") must be added up. The

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1   See Mestmäcker, in: Immenga and Mestmäcker, Article 23 Cartel Act, paragraphs 66 et seq., including further references; with regard to the acquisition of a stake, see Article 23 Cartel Act, paragraphs 70 et seq.; for the Merger Regulation, see Löffler, in: Langen and Bunte, Article 5 Merger Regulation, paragraph 8; see also the Commission notice on the concept of undertakings concerned, OJ C 66/14, 2. 3. 1998.

2   Expressly in Article 5 (2) Merger Regulation; for the Cartel Act, see Gugerbauer (1994), Kommentar, Article 2 a Cartel Act, paragraph 5.

3   See European Commission dated December 21, 1992, "PepsiCo/Kas", section 3.2, public version; summary WuW 1993, p. 109.

aggregate turnover between the affiliated undertakings ("internal turn-overs") is treated as a mere offsetting item and is not taken into account.[1])

This *"adding-up rule"* is designed to treat certain associations between undertakings as a unit in terms of competition law, because such undertakings are characterized by imperfect competition and cannot act in a completely mutually independent way.[2]) Hence, a prerequisite for adding up is that the association between undertakings gives them the opportunity to exercise a certain power on each other, with the Merger Regulation focusing on the existence of a possibility of exerting control.[3]) In accordance with Article 5 (4) (b) Merger Regulation, the concept of control applies to an undertaking which, directly or indirectly, owns more than half of the capital or business assets of another undertaking, or has the power to exercise more than half of the voting rights, or has the power to appoint more than half of the members of the supervisory board, or has the right in management bodies to manage the other undertaking's affairs. Apart from control under this form of majority participation, the Commission also takes into account turnovers in minority participations, if the stake also involves a controlling influence, e.g. within the framework of relevant contractual agreements. Attention should also be paid to cases, however, in which widespread share ownership entails a low attendance rate at a general meeting, paving the way for practically solitary decision-making. In accordance with the Cartel Act, whether turnover is added up hinges on the fact whether the association in question constitutes a *concentration* (Article 41 (1) Cartel Act). This way, in the majority of cases, calculation under Cartel Act criteria may produce higher turnover figures than according to Merger Regulation rules, as the Cartel Act provides for the adding up of group turnovers even in the case of participations of 25% without acquiring control[4]) (Article 41 para 1 item 3). The idea of using Article 228 Commercial Code (Handelsgesetzbuch – HGB) instead of Article 41 Cartel Act for purposes of adding up turnover pursuant to Article 2 a Cartel Act was not explored further in the legislative process.

The creation of a *joint venture* (Article 3 (2) Merger Regulation; Article 41 para 2 Cartel Act) involves the addition of all turnovers of all parties (and of all their affiliated undertakings) in order to take account of the fact that the joint venture is backed by the combined resources of the parent company.[5]) No account is taken of the turnover between the joint venture and the parent companies or with an undertaking connected with them.[6])

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1   See Article 5 (1) second sentence in connection with (4) Merger Regulation. For the Cartel Act, see Gugerbauer (1994), Kommentar, Article 2 a Cartel Act, paragraph 12. This applies, contrary to Gugerbauer, not only "between group undertakings, between controlling and dependent undertakings including jointly controlled undertakings", but also to all affiliated undertakings within the meaning of Article 41 Cartel Act; see also Wessely (1994), p. 476, footnote 9, and (1995), Medienfusionskontrolle, p. 107, footnote 397.

2   See Gugerbauer (1994), Kommentar, Article 2 Cartel Act, paragraph 5 (with reference to the 1972 government bill).

3   For details, see the Commission notice on calculation of turnover, OJ C 66/14, paragraphs 36 et seq.

4   For a fundamental discussion, see Wessely (1995), pp. 188ff.

5   See Wessely (1995), Medienfusionskontrolle p. 106; Gugerbauer (1994), Kommentar, Article 2 a Cartel Act, paragraph 12.

6   See Article 5 (5) (a) Merger Regulation and the Guidance Note III on Form CO, OJ L 377/25, 1994.

3.2 Relevant Turnovers

The *aggregate turnover* comprises the amounts of the undertakings concerned, after deduction of sales rebates, value added tax and other taxes directly related to turnover (Article 5 (1) Merger Regulation). In Austria, Gugerbauer argues, only turnover tax has to be deducted for lack of a corresponding regulation in the Cartel Act.[1]

The *period* used for calculating turnover amounts is the financial year preceding the concentration (Article 5 (1) Merger Regulation; as regards the Cartel Act, the 1993 government bill implies the same period, with Austrian legislation based on the German Cartel Act)[2]. If only a short period of time has elapsed since the end of the last financial year and the data have consequently a somewhat provisional character, the Merger Task Force usually makes do with the "best possible estimates"[3] if the data from previous years are clearly above the thresholds. More or less the same applies to the practice of the Austrian Cartel Court: For purposes of notification, Article 68 a Cartel Act requires only data on the amount of the turnover (supporting evidence is not necessary). Therefore a rough estimate of the turnover of the most recent financial year on the basis of previous results is sufficient. The parties concerned bear responsibility, however, for providing correct and complete information (Article 132 Cartel Act).

Under the European merger control procedure, the aggregate turnover indicated in the certified consolidated accounts of the undertaking must be given in *euro:* Turnover amounts of the period prior to January 1, 1999, have to be calculated on the basis of the average ECU exchange rates and converted, at a rate of 1:1, into euro. Euro exchange rates for non-euro area countries as well as ECU rates for the period up to January 1, 1999, can be found on the website of the OeNB[4] or of the Directorate General for Economic and Financial Affairs[5]. These rates are available for a limited number of currencies. If, in calculating turnover amounts, additional monthly euro exchange rates of other currencies are required, the average monthly/calendar year rates vis-à-vis the U.S. dollar are available at the Commission via fax[6] or e-mail[7].

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1   *See Gugerbauer (1995), Handbuch; Article 42 Cartel Act, paragraph 10.*

2   *See the travaux préparatoires on the 1993 Amendment to the Cartel Act, 1096 BlgNR XVIII. GP, p. 19.*

3   *See Drauz and Schröder (1995), p. 16.*

4   *http://www.oenb.at; see "Referenzkurse der EZB."*

5   *http://www.europa.eu.int/comm/economy_finance/index_en.htm; see "Euro exchange rates and yield curve."*

6   *+32-2-296.43.01/+32-2-296.72.44.*

7   *suat.gunduz@cec.eu.int.*

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(EEC) No. 4064/89 on the control of concentrations between undertakings
(OJ C 66/25, 1998).

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1   These Commission notices are available as pdf files on the website of Directorate General IV
(http://www.europa.eu.int/comm/competition/mergers/legislation/mergin98.html).

Abbreviations

WWU	Wirtschafts- und Währungsunion		GDP	Gross Domestic Product
AMS	Arbeitsmarktservice Österreich		HICP	Harmonized Index of Consumer Prices
	(Austrian Public Employment Office)		IHS	Institut für Höhere Studien
ARTIS	Austrian Real Time Interbank Settlement			(Institute for Advanced Studies)
BWA	Bundes-Wertpapieraufsicht		IIP	International Investment Position
	(Federal Securities Supervisory		IMF	International Monetary Fund
	Authority)		NACE	Nomenclature générale des Activités
BWG	Bankwesengesetz			économiques dans les
	(amendments to the Banking Act)			Communautés Européennes (Statistical
CAD	Capital Adequacy Directive			Classification of Economic Activities)
CEECs	Central and Eastern European Countries		ÖCPA	Austrian version of the Classification
COICOP	Classification Of Individual Consumption			of Products by Activities
	by Purpose		OECD	Organisation for Economic Co-operation
CPI	Consumer Price Index			and Development
EC	European Community		OeKB	Oesterreichische Kontrollbank
ECB	European Central Bank		OeNB	Oesterreichische Nationalbank
EEA	European Economic Area		ÖNACE	Austrian version of the Statistical
EEC	European Economic Community			Classification of Economic Activities
EGVG	Einführungsgesetz der		ÖSTAT	Statistik Österreich
	Verwaltungsverfahrensgesetze			Bundesanstalt öffentlichen Rechts
	(Introductory Act to the Administrative			(Statistics Austria)
	Procedure Acts)		RTGS	Real Time Gross Settlement System
EMU	Economic and Monetary Union		SDR	Special Drawing Right
EQOS	Electronic Quote and Order Driven		SNA	System of National Accounts
	System		TARGET	Trans European Automated Real Time
ERM	Exchange Rate Mechanism			Gross Settlement Express Transfer
ERP	European Recovery Program			System
ESCB	European System of Central Banks		TEU	Treaty on European Union
ESNA	European System of National Accounts		WIFO	Österreichisches Institut für
EU	European Union			Wirtschaftsforschung
Eurostat	Statistical Office of the European			(Austrian Institute of Economic Research)
	Communities			

Legend

− = The numerical value is zero
.. = Data not available at the reporting date
× = For technical reasons no data can be indicated
0 = A quantity which is smaller than half of the unit indicated
_ = New series

Note: Apparent arithmetical discrepancies in the tables are due to rounding.

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No 2531/98	Council Regulation (EC) concerning the application of minimum reserves by the European Central Bank	Nov. 23, 1998
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Calendar of Monetary and Economic Highlights	4/1999
Calendar of Monetary and Economic Highlights	1/2000
Calendar of Monetary and Economic Highlights	2/2000

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[1] For a comprehensive list of reports, summaries and studies hitherto published please refer to issue no. 4/1999 of "Focus on Austria."

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