

## 5 THE FINANCIAL INFRASTRUCTURE

The financial infrastructure, taking the form of payment systems and securities settlement systems, safeguards the transfer of assets between economic agents. Smooth operation of this infrastructure has a significant impact on the efficiency of the financial markets and the real economy. Payment systems and securities clearing and settlement systems are also channels through which the potential problems of one market participant may spread and set off a chain reaction, leading in extreme cases to financial instability. Therefore, it is vital to ensure that the infrastructure is not only efficient, but also safe and secure.

Oversight of payment systems and securities settlement systems consists primarily in setting rules and standards that minimise systemic risk and promote efficiency of the systems, and subsequently in implementing those standards. By law, the CNB performs oversight of the CERTIS and SKD systems.<sup>108</sup> As in previous years, the operation of both systems was smooth and trouble-free in 2005.

Besides the financial infrastructure as such, some aspects of the regulatory environment are an important factor affecting financial stability. In 2005, these included in particular the compulsory introduction of international accounting standards that can be regarded as part of the financial infrastructure in the broader sense.

### 5.1 SKD AND CERTIS – TRANSACTION VOLUMES AND RECENT DEVELOPMENTS

The Short-Term Bond System (SKD) is used for issuing and registering all book-entry securities with maturities of up to one year and for settling trades in these securities. In 2005 it processed around 14,500 transactions with a total value of CZK 38,742 billion. An average of CZK 154 billion was processed every day. SKD's turnover in roughly 19 days equalled annual nominal GDP. The total transaction value of around CZK 40 billion has been broadly stable since 2003. The interest-free intraday credit that the CNB provides to SKD clients for smooth settlement of operations in the CERTIS system rose from CZK 3,055 billion in 2004 to CZK 3,557 billion in 2005, i.e. by roughly CZK 500 million. The steady rise in the volume of intraday credit in recent years can be attributed to banks' increasing awareness of the ways it can be used. The higher recourse to intraday credit is having a positive impact on the smoothness of operation of CERTIS and thus on the stability of the payment system.

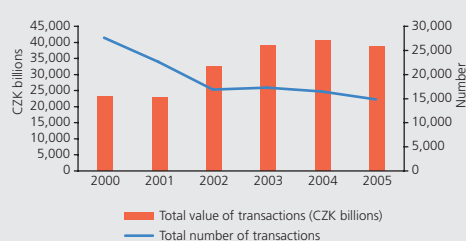
A fundamentally revised version of the SKD rules was published in 2005. The rules govern the SKD environment and the rights and duties of SKD participants in compliance with legal changes related to the Czech Republic's EU entry (in particular, they reflect legislative changes linked with the amendment of the Capital Market Undertakings Act and the Securities Act). The new version of the Rules takes into account changes in the SKD, which have extended its functionality, made it more user-friendly and enhanced its security.<sup>109</sup>

<sup>108</sup> A more detailed description of the systems was published in the 2004 Financial Stability Report.

<sup>109</sup> Electronic communication between the agent's employees and the SKD is protected by encryption and electronic signature. The CNB as the certification authority issues certificates to the agent's employees which entitle them to communicate electronically with the SKD under the principle of distributed responsibility. That means the CNB only guarantees the identity of selected employees of the agent (administrators), who in turn guarantee the identity of other employees of the agent.

CHART V. 1

Volume and number of transactions processed in SKD



Source: CNB

TAB. V. 1

CERTIS interbank payment system – statistical information

Period	Turnover (CZK billions)	Average daily turnover (CZK billions)	No. of transactions (millions)	Average daily no. of transactions (millions)	GDP/Average daily turnover
2002	100,343	431	262	1.12	5.6
2003	96,938	385	317	1.26	6.6
2004	110,127	434	333	1.32	6.4
2005	123,354	488	356	1.40	6.0

Source: CNB

TAB. V. 2

CERTIS interbank payment system – charges  
Charges billed to the payer's bank (in EUR)

	Encrypted non-priority items	Non-encrypted non-priority items	Priority items
17:00 – 00:00	0.008	0.013	0.17
00:00 – 08:30	0.022	0.027	0.17
08:30 – 12:30	0.044	0.05	0.17
12:30 – 13:30	0.17	0.17	0.34
13:30 – 14:30	0.67	0.67	0.67
14:30 – 15:30	6.72	6.72	6.72

Source: CNB

The biggest change was the creation of the function of custodian<sup>110</sup> in the SKD. Custodians maintain customer accounts within the legally permitted two-tier registration of securities. A custodian does not own securities; they remain in the ownership of its customers. Custodians thus become SKD participants alongside agents and clients.

In 2005, the CERTIS interbank payment system processed 356.2 million transactions totalling CZK 123,354 billion. The average daily number of transactions processed by CERTIS has grown steadily since 1992, reaching 1.41 million in 2005. The average daily transaction value was CZK 488 billion. This means that it took six business days to reach a turnover equal to annual nominal GDP. 2005 saw a record of 4,456,396 items processed without trouble during a single day. The previous maximum reached in 2004 was exceeded by almost 21%. Even this all-time high was below the capacity of CERTIS, which was designed to process 5 million items. Even if this limit were to be temporarily exceeded, the system has mechanisms to ensure smooth operation. The smoothness of the system's operation is also aided by a fee-charging policy which motivates users to enter most transactions during the first part of the business day so that accumulation of payments towards the end of operating hours is avoided.

In order to test the functionality of the CNB clearing centre's backup facility, CERTIS items were processed in this facility on two days in 2005. Operation was not interrupted and no problems with its smoothness occurred. Regular testing of the backup facility is a part of the contingency plan to ensure operational reliability of the system. Such testing contributes to the fulfilment of Core Principle 7 (see section 5.2 for details on the Core Principles).

## 5.2 OVERSIGHT OF THE CERTIS AND SKD SYSTEMS

Ensuring the safe and smooth operation of CERTIS and SKD is one of the key tasks entrusted by law to the CNB, which administers and supervises these systems. The systems are, therefore, subject to regular internal audits, but they are also monitored and assessed in terms of compliance with international standards. The participants in securities clearing and settlement systems face a number of risks that must be identified and analysed so that they can be managed effectively.

### Box 5: Risks in Securities Settlement Systems and Payment Systems<sup>111</sup>

#### 1. Risks in securities settlement systems (SSS)

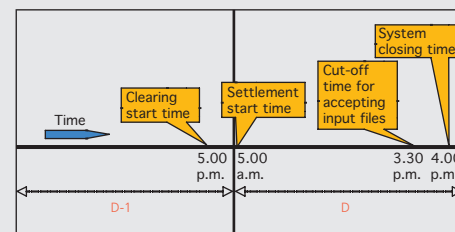
The main risks facing SSS participants consist in their counterparties either being unable to meet their obligations (*credit risk*) or meeting their obligations with a delay (*liquidity risk*). Other potential risks are connected with the safekeeping and administration of securities (*custody risk*), failure of information systems or the internal control system (*operational risk*) or failure of the legal framework governing the rules and procedures for the SSS (*legal risk*). If a default by one participant results in other participants being unable to meet their obligations, an SSS may become a source of instability of the whole financial system (*systemic risk*).

<sup>110</sup> Custody is the safekeeping and administration of securities and financial instruments owned by other persons. A custodian is an entity that offers custody services to its customers. In the case of the SKD, a custodian is a legal entity with which the CNB has concluded an SKD customer account contract. Securities owned by persons other than the custodian (the custodian's clients) are registered on this account. A custodian may have one or more customer accounts in the SKD. Each customer account can be accessed by the custodian through an agent specified in the contract. A custodian registers securities on the owner's accounts.

<sup>111</sup> The method of risk management in the SKD and CERTIS systems was described in the 2004 Financial Stability Report.

CHART V. 2

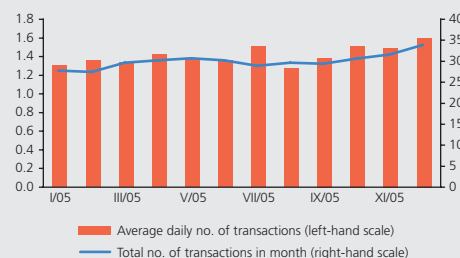
CERTIS interbank payment system – operating cycle



Source: CNB

CHART V. 3

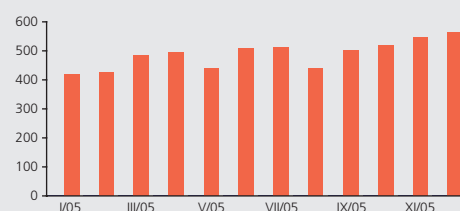
Number of transactions processed by CERTIS in 2005 (millions)



Source: CNB

CHART V. 4

Average daily turnover in CERTIS in 2005 (CZK billions)



Source: CNB

*Credit risk* is the risk of loss caused by a participant defaulting, usually as a result of his insolvency. There are several types of credit risk. In terms of the effect on the stability of the financial system, *settlement risk* is the gravest one. If a party to a securities transaction goes bankrupt before settlement, the funds are not transferred from the buyer to the seller. If, in the meantime, the settlement system transferred ownership of the security from the seller to the buyer, the seller loses the whole value of the security. If this loss is large, it may in turn cause the seller's bankruptcy and transfer the risk on to his creditors. To eliminate this risk of contagion as far as possible, most SSSs operate on the DVP (delivery versus payment) principle. DVP interconnects the payment transfer system and the securities transfer system so that it is guaranteed that securities are transferred only if payment has been made. An example of three banks shows how the introduction of DVP leads to a reallocation of the demands on the bank going bankrupt. Bank B has obligations to bank C of 25 and assets worth 10. Bank A is not aware of bank B's poor financial condition and sells it securities worth 50. If the SSS does not operate on the DVP principle, it will transfer the securities from A to B on the settlement day. In the meantime, B finds itself in a situation where it cannot pay bank A. B now has assets of 10+50, payables to bank A of 50 and payables to bank C of 25. After B is declared bankrupt, its assets are divided proportionally between A and C. A receives 40 and C receives 20. Bank A thus suffers a loss of 10 and C a loss of 5. Settlement under the DVP system would be different. The transaction between A and B would be cancelled (because B would be unable to pay A). Bank A would therefore record no loss and C would receive B's remaining assets worth 10. The loss incurred by C would be larger (15). This example clearly shows that DVP does reduce the losses of trading partners (bank A) that may be caused by a bank's bankruptcy (B), but also increases the potential losses of other creditors of the bank (C). Therefore, the question arises whether DVP necessarily eliminates the risk of contagion (systemic risk). In this context, we should mention that banks' creditors, who often provide long-term loans to banks and are exposed to such risk for a longer period, usually have sophisticated risk management methods in place and are better able to reduce their risk exposures.

DVP does not address all components of systemic risk. For example, if the seller of a security is unable to deliver the security on the agreed date to the buyer's account, DVP settlement is deferred and then cancelled after an agreed period of time. In the meantime, however, the seller may have sold the security to another party, causing it to be unable to meet its obligations by failing to deliver the security. In order to avoid this type of contagion, the Central Securities Depositories (CSD)<sup>112</sup> organise a securities lending programme. A participant in the programme who has uncovered obligations to deliver securities will automatically receive a collateralised loan from another participant.

Another component of systemic risk relates to the financial soundness of the system. Most CSDs are not allowed to provide credit. Some of them, however, provide collateralised or non-collateralised credit to system participants. For example, the international central depositories Euroclear and Clearstream Banking Luxembourg do so to ensure smooth operation of the system and prevent contagion. Failure to repay such credit may cause problems for the SSS itself. Regulators thus try to make sure that non-collateralised credit is granted to the smallest extent possible and that adequate risk management measures are in place.

<sup>112</sup> Entities acting as primary depositories for nearly all securities issued may also perform clearing and settlement. In the Czech Republic, the establishment of a central depository is under preparation.

Settlement risk includes *liquidity risk*. Liquidity risk is the risk that the seller of a security will not receive payment in time and will have to borrow funds or liquidate his assets in order to complete other payments. The buyer of a security faces the risk that he will not receive the security on the agreed date and will have to borrow a security from a third party to meet his obligations. The costs related to liquidity risk depend on the market's liquidity: the more liquid the market, the lower the costs. Liquidity shortages may cause systemic problems, especially in an environment of rapidly changing security prices. Concerns over a loss of the full value of the principal may induce some participants to refuse securities delivery and payment.

SSS participants also face settlement bank *failure risk*. The failure of a bank that keeps money accounts for the settlement of the payment obligations of CSD members may disrupt settlement and result in serious losses and liquidity pressures on these participants. The effect can be particularly grave if all the participants use the same bank. Therefore, in those SSSs where the use of a single bank is required this is usually the central bank or a special-purpose bank with strong risk management and access to considerable funds. A choice of several settlement banks is an alternative.

*Custody risk* is the risk of loss of securities entrusted to a custodian due to his insolvency, neglect or fraudulent behaviour. Custody risk is particularly important for indirect SSS participants, whose securities are in the custody of direct participants. In this context, we should mention the special features of securities accounts, which differ from money accounts as follows: securities kept on securities accounts with a bank or another entity are not a liability of the bank. The owner of the securities does not lose the securities if the bank goes bankrupt. However, his ability to perform transactions in the securities can be temporarily endangered.

Considerable attention is paid to *operational* reliability, especially in relation to SSSs of systemic importance. The probability of technical problems in the system has to be minimised. For example, the capacity of the system must enable trouble-free operation even with extraordinary volumes of instructions processed. The system should regularly create backup data and a backup facility should exist in a physically separate location, enabling the system to operate smoothly even in emergencies.

The human factor in an SSS may cause incorrect transfers or loss of securities. If an SSS transfers securities to an incorrect party due to an erroneously inputted instruction, the system can be disrupted. The matching of instructions from both parties minimises this risk.

Last but not least, a sound legal framework is necessary for an SSS to operate safely. The risk that unexpected application of a different law will make existing contracts unlawful or unenforceable increases in the cross-border context. *Legal risk* thus amplifies other risks such as market risk, credit risk or liquidity risk.

## 2. Risks in payment systems

Payment and clearing systems are, as a rule, heavily dependent on SSSs, as they use securities as collateral in their own risk management procedures. As in SSSs, risks in payment systems can be classified as *financial* (credit, liquidity, systemic) and *operational* (human error, abuse, technical failure, legal risk). Operational risks in payment systems are similar to those in SSSs.

It was the financial risks in the original payment systems that resulted in their transformation from netting systems<sup>113</sup> to RTGS (real-time gross settlement) systems. Real-time gross settlement systems are relatively safe, because they completely eliminate credit risk. Central banks have a number of instruments to eliminate liquidity risk, e.g. the provision of intraday credit against collateral. Other measures have also been implemented, such as settlement finality.

The efforts of regulators and other institutions have resulted in the creation of various international standards. Compliance with these standards should minimise the above-mentioned risks as far as possible.

A joint working group of the European System of Central Banks (ESCB) and the Committee of European Securities Regulators (CESR) issued in 2001 and published in 2003 a document called "Standards for Securities Clearing and Settlement in the European Union". The standards were subsequently adapted to the European context and it was specified to which institutions they should apply. To this end, the concept of "systemically important system operator" was introduced, designating an institution whose collapse would have a significant effect on the market as a whole due to the scope of its activities. In 2005, an ESCB-CESR Working Group prepared a revision of the standards, which concerned securities settlement systems as well as central counterparties. The CNB continuously monitors the evolution of the ESCB-CESR standards and is actively involved in the discussions so that SKD is prepared for evaluation against these standards after they are completed.

In September 2002, the ECB Governing Council decided that the ECB would assist the acceding countries in assessing themselves against the "Standards for the Use of EU Securities Settlement Systems in ESCB Credit Operations". The assessment of the SKD system against these standards, which took place in 2003, aimed to make sure that the existing infrastructure was adequate for settlement of securities transactions in Eurosystem credit operations. The results for most of the nine standards were satisfactory and SKD was considered eligible for use in Eurosystem credit operations.

In January 2001, the ECB Governing Council adopted the "Core Principles for Systemically Important Payment Systems"<sup>114</sup> as the minimum requirements of common Eurosystem supervisory policy for systemically important payment systems. The Core Principles apply to all systemically important payment systems in all countries of the world. The CERTIS system is a systemically important system whose operation, in line with the Core Principles, is of key importance to the stability of the financial system in the Czech Republic. Under a Governing Council decision, all ESCB central banks assessed their local systems as of mid-2003. In the case of CERTIS all the relevant criteria were assessed as either "fully observed" or "largely observed".

### 5.3 REGULATORY DEVELOPMENTS IN THE FINANCIAL INFRASTRUCTURE

The legislative process for the amendment of Act No. 124/2002 Coll., on Transfers of Funds, Electronic Payment Instruments and Payment Systems (the Payment System Act) continued in 2005. In line with European law, the amendment should above all introduce electronic money institutions into Czech law. The conditions under which the CNB grants prior consent to issue electronic money instruments to

113 Payment instructions from payers' banks are collected for a certain period of time and the net mutual positions of banks are calculated and settled as of the end of that period. Netting systems thus do not guarantee settlement finality. Payments become irrevocable only after the transfer of funds from the net debtor's account to the net creditor's account.

114 Issued by the BIS Committee on Payment and Settlement Systems.

entities other than banks have also been simplified and clarified. In 2005, the CNB again conducted a number of administrative proceedings on the issuing of electronic money instruments, within which 19 prior consents were granted, particularly in the bus transport area.

Under an amendment to Act No. 6/1993 Coll., on the Czech National Bank, credit unions may now participate in the CERTIS system. The scope of a CNB decree issued to provide for a single payment and settlement system in the Czech Republic (currently Decree No. 62/2004 Coll.) was also extended to credit unions.

In collaboration with the Financial Arbiter, the CNB was involved in the second amendment to the Act on the Financial Arbiter in 2005. The amendment reacts to the adoption of new administrative procedure rules and eliminates their negative effects on the principles of informality, speed and flexibility of proceedings brought before the Arbiter. It also incorporates into the Act the experience gained from the Arbiter's work.

#### **5.4 THE IMPACT OF THE INTRODUCTION OF INTERNATIONAL FINANCIAL REPORTING STANDARDS ON CZECH BANKS**

The introduction of single accounting standards and information disclosure rules undoubtedly contributes to the transparency and comparability of financial statements and thereby to financial stability. The application of these standards, however, may have a significant effect on accounting statements and consequently on the various indicators used to assess the financial soundness of individual institutions and the sector as a whole.

In order to harmonise the European financial markets, the International Accounting Standards Board issues the international accounting standards IAS/IFRS.<sup>115</sup> According to Regulation (EC) No. 1606/2002 of the European Parliament and of the Council of 19 July 2002, these standards are binding for the consolidated balance sheets of companies, including banks, which issue securities listed on European markets, from 1 January 2005. National legislation can extend the application of IAS to individual financial statements of such companies and to all other entities.

Standards requiring fair value measurement of assets are the most important for the calculation of regulatory capital. These include the IAS 39, which is very important for the banking sector because it defines the rules of recognition and measurement of financial instruments. According to this standard, financial assets held for trading, derivatives and instruments available for sale must be measured at fair value, and unrealized profit or loss due to revaluation must be recorded as a direct change in equity (e.g. in revaluation reserves). Loans and receivables, as well as assets held to maturity, must be valued and recorded at their amortised cost. At the same time, however, IAS 39 introduces the fair value option (FVO), which enables the users of the standard to present any financial instrument at fair value. FVO can be applied to all financial assets and financial liabilities without any restrictions at the decision of the company's management.

From the very beginning, the discussions of the FVO concept conducted by experts and the institutions concerned were accompanied by concerns over the effect on financial stability. In the case of assets and liabilities held to maturity, fair value accounting can be misleading and artificial. It can reduce the capacity of banks to respond to adverse developments, increase the volatility of profit and equity, and thereby reinforce the pro-cyclical nature of banking operations. In the event of shocks including a price component (e.g. a radical change in interest rates,

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<sup>115</sup> IFRS (International Financial Reporting Standards) were originally called IAS (International Accounting Standards).

a property market crisis or a stock market slump), premature recognition of unrealised value changes can further aggravate the impact of the shock. Banks could respond with panicky sales, fostering a deepening of the crisis.

The IASB reacted to this criticism in 2004 by issuing specific rules limiting the use of fair value. In line with this, the EU adopted IAS 39 only in part, in a "carved-out" version without the fair value option. The EU version of IAS 39 prohibits the use of fair value for liabilities (excluding liabilities held for trading and derivatives).

The long-running discussion between auditors and supervisors eventually resulted in a compromise. In June 2005, the IASB adopted basic principles restricting the use of the fair value option from 1 January 2006 to the following: (i) reduction or elimination of accounting inconsistencies in matching instruments; (ii) assets and liabilities managed or internally reported by the management on the fair value principle; (iii) instruments containing embedded derivatives which are not closely linked to the host contract. This modification has the support of EU regulators and the adoption of a full standard for EU member states took effect as of 1 January 2006.

The compulsory application of IFRS in the EU also generated a discussion on the possible impact on capital requirements under the prudential rules. This discussion, conducted at the level of the Basel Committee on Banking Supervision and the Committee of European Banking Supervisors (CEBS) resulted in a proposal for "prudential filters". i.e. changes to accounting capital for the calculation of capital requirements. One of these filters is linked with the application of fair value: profit/loss from the change in the fair value of financial liabilities due to internal credit risk is not to be reflected in Tier 1 and Tier 2.<sup>116</sup>

The assessment of the impact of the introduction of IFRS on financial stability depends largely on the specific conditions in individual countries. The Czech Republic succeeded in harmonising its accounting rules with the IFRS requirements in gradual steps. Among other things, the amendment to the Act on Accounting (effective from 1 January 2002) enabled fair value measurement of assets and liabilities. A related CNB Provision implemented IFRS as far as possible. The introduction of accounting values comparable with IFRS (above all the recognition of securities including short sales at fair value) in Czech financial institutions as from 1 January 2002 did not affect the volatility of financial performance. The charts of accounts, accounting procedures and essential elements of the solo and consolidated financial statements of banks, credit unions, investment firms, investment companies and pension, investment and mutual funds were unified. Under the Act on Accounting, consolidating accounting units that issue securities listed on a regulated market in EU member states must use the international accounting standards governed by Community law when compiling their consolidated financial statements and annual reports. Other accounting units can choose between IFRS and Czech accounting standards when compiling their consolidated financial statements. They have to compile and report their solo financial statements according to Czech accounting standards and regulations. This means that the IFRS are compulsory for almost 70% of the Czech banking sector as measured by total assets. In the Czech Republic, seven banks and one insurance company keep their accounts according to the IFRS. Czech accounting standards,

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116 Tier 1 capital is the highest-quality part of regulatory capital. In Czech banks it is also the largest part. Equity capital, retained earnings and statutory reserve funds are the dominant components of Tier 1 capital. Tier 2 capital is currently used less. The most important part of this component of regulatory capital is subordinated liabilities.

used by the remaining banks, are very similar to the IFRS. They are based on the same principles of accounting, clearing and valuation of financial instruments, including derivatives. The compulsory introduction of the IFRS in the Czech Republic therefore did not generate any new risks to financial stability.

The comparability of statements was, however, affected by a change in the international accounting standards themselves, specifically to IAS 39, effective also from 1 January 2005. The revised IAS 39 newly defined the categories, content and manner of reporting of financial instruments. The most important effects of this change on the performance of banks can be observed in the volume and structure of client loans and securities. This is due to a new definition of loans and receivables, which no longer include bonds acquired in the primary market and quoted in an active market.<sup>117</sup> The breakdown of profit from financial activities was affected by a change in the reporting of securities measured at fair value against expenses or income accounts, where accrued interest no longer needs to be presented separately. Thus, interest income from such securities does not have to be included in interest profit but can be part of profit from securities held for trading (in the area of profit from financial operations).<sup>118</sup> These changes should be appropriately reflected in the interpretation of the results of the indicators used to assess financial stability.

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117 For example, claims on banking sector clients rose in 2005 H1 by CZK 19.9 billion, or 1.9%, in net terms. Securities acquired in initial public offerings which were not held for trading were reported together with claims (on clients as well as banks) until the end of 2004. Under the amendment, a security is classified in the loans and receivables category depending on whether the financial instrument is tradable on a public market. Thus, loans and receivables now only include securities that are not publicly tradable. The growth claims on clients of the banking sector would have been higher without this change in methodology. It is difficult to determine an exact figure; 8.1% is the estimate.

118 In connection with this change in methodology, 2005 H1 saw a significant increase of CZK 2.5 billion in profit from securities held for trading, which affected the rise in profit from other financial operations of 31.5% year on year.