

Sweden: Financial Sector Assessment Program Update—Detailed Assessment of Observance on CPSS Core Principles for Systemically Important Payment (RIX)

This Detailed Assessment of Observance on CPSS Core Principles for Systemically Important Payment (RIX) was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed in September, 2011. The views expressed in this document are those of the staff team and do not necessarily reflect the views of the government of Sweden or the Executive Board of the IMF.

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FINANCIAL SECTOR ASSESSMENT PROGRAM UPDATE

SWEDEN

ASSESSMENTS OF OBSERVANCE OF CPPS CORE PRINCIPLES
FOR SYSTEMICALLY IMPORTANT PAYMENT (RIX)

DETAILED ASSESSMENT OF OBSERVANCE

SEPTEMBER 2011

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GLOSSARY

ACH	Automated Clearing House
BGC	Bankgirocentralen BGC AB
CLS	Continuous Linked Settlement
CCP	Central Counterparty
CLS	Continuous Linked Settlement
CPSIPS	Core Principles for Systemically Important Payment Systems
CPSS	Committee on Payment and Settlement Systems
CRM	Conditional Release Mechanism
CSD	Central Securities Depository
DKK	Danish kronor
DVP	Delivery versus Payment
EC	European Commission
EEA	European Economic Area
EMCF	European Multilateral Clearing Facility N.V
ESCB	European System of Central Banks
EU	The European Union
EUR	Euro
FI	Finansinspektionen
FIFO	First-in First-Out
FSAP	Financial Sector Assessment Program
IT	Information Technology
LOM	Liquidity Optimization Mechanisms
MiFID	Markets in Financial Instruments Directive
MoF	Ministry of Finance
MoU	Memorandum of Understanding
RB	The Riksbank
RIX	The Riksbank's Funds Transfer System
RTGS	Real-Time Gross Settlement
RTM	Real-Time Settlement Mechanism
SBA	Swedish Bankers' Association
SCP	Scandinavian Cash Pool
SEK	Swedish kronor
SIA-SSB	Società Interbancaria per l'Automazione - Società per i Servizi Bancari
SLA	Service Level Agreements
SNDO	Swedish National Debt Office
SSS	Securities Settlement System
STP	Straight Through Processing

I. SUMMARY ASSESSMENT

1. **This assessment was undertaken in March 2011 in the context of an IMF Financial Sector Assessment Program (FSAP) mission covering, inter alia, the *Core Principles for Systemically Important Payment Systems (CPSIPS)*.**¹ This assessment covers the Riksbank's Funds Transfer System (RIX), providing facilities for real-time gross settlement (RTGS) in central bank money of Swedish kronor (SEK) payment transactions.
2. **Sveriges Riksbank (the Riksbank, shortly RB) has conducted a formal self-assessment of the RIX system's observance of the Core Principles (CP).** This assessment was made available to the mission. The RB also provided a large number of documents relevant for the assessment. Extensive meetings were held with officials from the RB, supplemented by discussions with officials from the Ministry of Finance (MoF), the Swedish Banker's Association (SBA), and four RIX participants (two banks and two institutions providing clearing or settlement services).
3. **The Committee on Payment and Settlement Systems' (CPSS) Report on CPSIPS Part I and II and an IMF and World Bank guidance note were used when assessing the RIX system.** The logistical support and warm hospitality of the officials of RB as well as the constructive and informative discussions with all other parties are greatly appreciated.

II. INSTITUTIONAL ARRANGEMENTS

4. **The RB's responsibilities in respect to the payments system and its various components are formulated in very general terms in the Sveriges Riksbank Act.** According to the act, the RB has a task to promote a safe and efficient payment system, which has been interpreted as a task to look after the stability of the Swedish financial system. To this end, safe and efficient financial market infrastructures play a critical role and the RB's role as an overseer of the payments system therefore derives from this task. The Riksbank Act also states that the RB may make available systems for settlement of payments and, in other ways, participate in the settlement of payments. The RB runs the funds transfer system called RIX.
5. **Finansinspektionen (FI) is the Swedish financial supervisory authority.** FI is responsible for the supervision of companies operating in the credit, insurance, and securities markets. This includes the supervision of all clearing organizations and payment systems, except for RIX, which is operated and overseen by the RB. Contribution to the stability and efficiency of the Swedish financial sector is part of FI's overall objective. FI reports to the MOF.

¹ This assessment was prepared by Tom Kokkola (European Central Bank).

6. **The MoF has responsibility in relation to legislation that makes the financial system efficient and stable.** The MoF also follows developments in the financial markets and business sector so as to be able to assess the need for new legislation or amendments to existing laws. Much of the legislation in the financial markets area is the European Union (EU) legislation. The EU goal is to establish a single market for financial services.
7. **The Swedish Competition Authority, Konkurrensverket, is a state authority with a mandate to safeguard and facilitate competition and to supervise public procurement in Sweden.** A new Competition Act entered into force on November 1, 2008. This act is based on the competition rules of the European Union.
8. **The Swedish National Debt Office (SNDO), Riksgälden, is an agency reporting to the MoF and its responsibilities include central government cash management, managing central government debt, and providing state guarantees and loans.** Additionally, the SNDO is responsible for the deposit insurance and investment schemes and government support to banks. The SNDO participates in the RIX system as the government agency responsible for the processing and management of government payments.
9. **The Swedish Consumer Agency, Konsumentverket, is the government agency responsible for consumer protection issues, including those related to the payment system.** In practice, the agency's role in the payment systems field mainly concerns the debit and credit card sector, where guidelines have been formulated and negotiated with the card-issuing companies.
10. **In the private sector, the SBA, Svenska Bankföreningen, has standing committees which discuss and coordinate issues concerning the processing of payments and regulatory and technical aspects of payment systems.** One example is that within the framework of this association, the participants in RIX (excluding the public entities) enter into agreements with one another about cut-off times and the processing of payments. The association is also owner of a retail payment system (credit transfer) in Sweden, the Data Clearing System, which is operated by Bankgirocentralen BGC AB (BGC).
11. **The Swedish banking sector is highly concentrated, with the four largest commercial banks accounting for almost three-quarters of household and corporate lending and an even higher proportion of payment activities in 2010.** Foreign banks are allowed to operate in Sweden through branches as well as through subsidiaries. There are 27 foreign banks represented on the Swedish market, almost all through branches.

III. THE PAYMENT INFRASTRUCTURE IN SWEDEN

12. **The RB owns and runs the funds transfer system named RIX.** RIX started operating in 1990. In February 2009, the technical system and the technical platform were replaced with a new system delivered by the Italian firm Società Interbancaria per

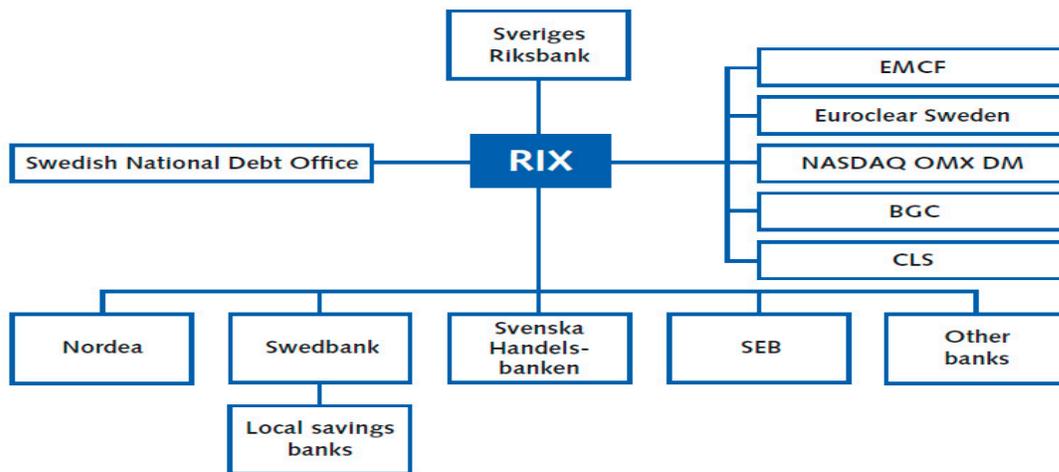
l'Automazione - Società per i Servizi Bancari (SIA-SSB). RIX is open from 7:00 a.m. until 5:00 p.m. and has 24 participants.

13. **The Swedish Central Securities Depository (CSD), Euroclear Sweden, operates the Securities Settlement System (SSS).** Equities, bonds, and money market instruments are all dematerialized and handled in book-entry form in an in-house developed system.

14. **NASDAQ OMX runs the Swedish stock exchange, the derivatives exchange, and the electronic inter-dealer exchange for certain government bonds.** This same entity acts as the central counterparty (CCP) for derivatives and repo transactions.

15. **A second CCP, the European Multilateral Clearing Facility (EMCF), was introduced in the Swedish equity market in 2009.** EMCF (licensed in the Netherlands) acts as a CCP in the clearing of cash equity transactions on the NASDAQ OMX exchanges in Stockholm, Copenhagen and Helsinki and on some other multilateral trading platforms operating in the Nordic countries.

Figure 1. Sweden: The Main Market Infrastructure Components



Source: Riksbank.

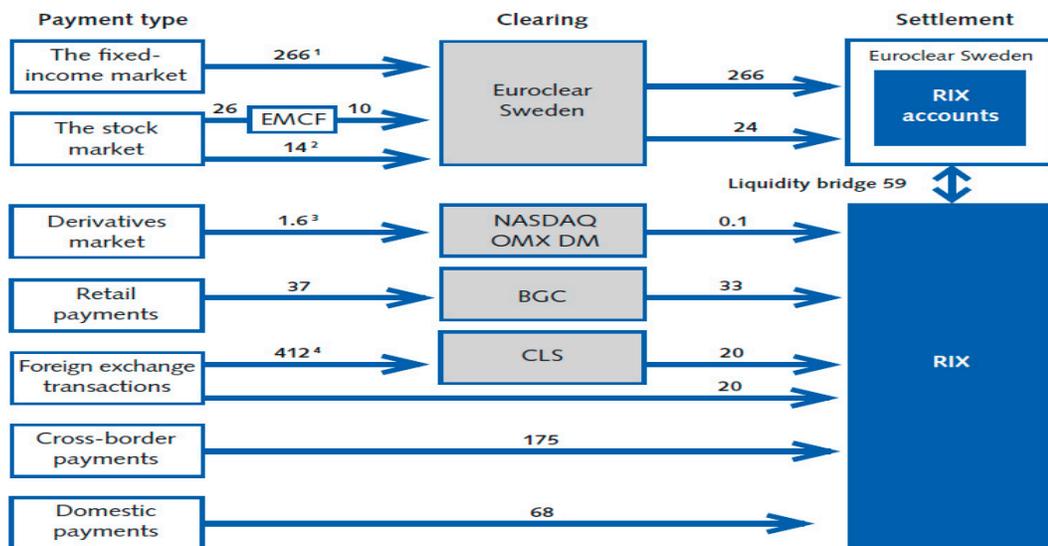
Table 1. Sweden: Systemically Important Payment Systems 2010

System	Name of the System	Number of Participants	Daily value of instructions (SEK, billions)	Average value per transaction settled(SEK)	Daily volume of instructions
1	RIX	24	487	40,228,000	12, 106
2	BGC	22	39.4	11,530	3,416,667

Source: Riksbank.

Figure 2. Sweden: Payment Flows in the Swedish Financial Infrastructure 2009

(Indicative value in SEK billion per day)



Source: Riksbank.

16. **There is one major retail payment system in Sweden.** Bankgirocentralen (BGC) offers Automated Clearing House (ACH) services with settlements occurring at participants accounts in RIX. BGC provides services for several payment products and schemes. The large majority of clearing positions are settled on a bilateral gross basis between the participants concerned.

IV. THE FUNCTIONING OF THE RIX SYSTEM

17. **In RIX, payments are processed as follows: a payment message (MT 103 or MT 202) is submitted to the SWIFT network.** This message is held in the FIN Y-Copy service and a settlement request (MT 096) containing a subset of the original message is forwarded to the RTGS, via the RTGS CBT. On reaching the RTGS, all payment messages pass through a procedure consisting of the following six stages:

- In the first step, the payment instruction is interpreted. This means that the information in the instruction is simplified in certain cases or it can be complemented in accordance with set rules;
- In the second step, validation of the payment instruction takes place. Validation means checking that the payment instruction complies with the format requirements and applicable specifications in the system;
- In the third step, RIX checks whether any special conditions are attached to the payment instruction. If the payment instruction is conditional (future time, future event or activation), it will be placed in the RIX Conditional Release Mechanism (CRM);
- In the fourth step, it will be checked whether the recipient is subject to Stop Receiving and whether the paying RIX participant is subject to Stop Paying and whether bilateral limits are registered. In cases where bilateral limits are registered, whether a paying RIX participant's bilateral limit on the recipient participant would be exceeded by the transfer is checked;
- In the fifth step, certain renewed validation is made of the payment instructions, which have been placed in the CRM; and
- In the sixth step, the transfer is effected. Before the transfer is effected by RIX, there is always a check of sufficient funds of the account which is to be debited. Then, the sender's account is debited and the recipient's account credited. Once settlement has taken place, the SWIFT FIN-Copy Service is notified by a (MT 097) message, which in turn releases the original payment message to the receiver—the latter will know that funds have been received with intraday finality. If subscribing to SWIFT FIN-Copy notifications, the sending party will be notified about the settlement by means of a (MT 012) message sent by SWIFT. Additional notifications can be received directly from RIX if subscribed for.

18. **RIX participants have a number of tools available to manage their liquidity and payment flows.** A participant can choose to immediately settle a transaction via its principal account real-time settlement mechanism (RTM) or to use one of the five *liquidity*

optimization mechanisms (LOMs) that exist. Liquidity can be transferred flexibly between the principal account and LOMs, and between LOMs.

19. **All LOMs have queuing facilities.** Priorities can be assigned to payments (the range of priorities available varies and is separately defined for each LOM)—such priorities can be changed if the payment gets into a queue. Time codes can be assigned to a payment, indicating either the first or latest time for settlement. Payments sent to the principal account are settled only if sufficient funds are available, otherwise the payment is rejected (no queuing).

20. **Most payments are settled in the RIX-LOM.** There are also LOMs for special types of transaction: BGC-LOM (retail settlement), VPC-LOM (securities), OMX-LOM (CCP) and CLS-LOM (foreign exchange). Liquidity can be reserved for individual LOMs and conditions can be set for how settlement is to take place.

21. **For the RIX-LOM and BGC-LOM, settlement can take place with the help of optimization procedures (“Gridlock Buster”).** This is done by utilizing queued incoming payments in bilateral or multilateral off-setting (in each case the included payments will be settled gross in a logical block where either all or none of the payments are settled). For other LOMs, the mechanism is primarily used to reserve liquidity for a special settlement cycle or time-critical payments.

Table 2. Sweden: RIX Payments Statistics 2005–2010

	2005	2006	2007	2008	2009	2010
Number of participants	21	20	21	21	23	24
Volume, million transactions	1,50	1,70	1,95	2,01	2,58	2,96
Value, billion SEK	111,174	124,750	122,873	136,600	174,562	137,370

Source: Riksbank.

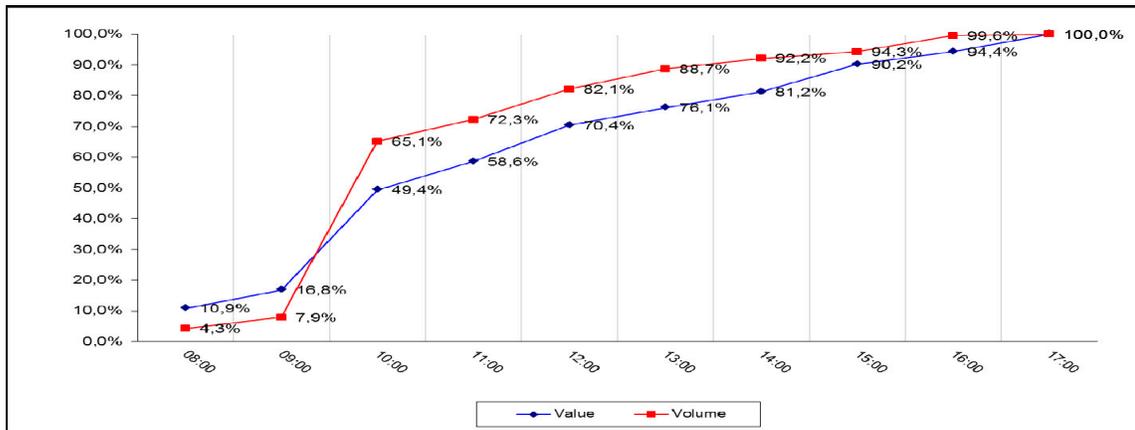
22. **Via a special interface, RIX Online participants can see their own transactions and position.** It is also possible to see queued transactions and to change the priority of a queued payment. Information on collateral and intraday liquidity can also be obtained via the same function.

23. **RIX participants are responsible for the management of their liquidity in the RIX system.** In a Settlement Agreement (a voluntary Code of Conduct), participants have agreed on the times during the day when different types of payment are to be settled. The Settlement Agreement also stipulates the liquidity that users must as a minimum maintain for settlement of their transactions.

24. **A special feature of RIX is that special settlement accounts have been outsourced to Euroclear Sweden in view of allowing integrated delivery-versus-payment (DvP) settlement of securities and cash (in central bank money) in the Euroclear Sweden system.** It is also possible to generate intraday credit in the Euroclear Sweden system, subject to the same rules and procedures as applied by RB. The arrangement is tightly controlled by RB.
25. **RB has not made banks subject to a reserve requirement and, thus, banks aim to have a zero balance with the central bank overnight (as at mid-March 2011 the banking sector is some SEK 11 billion long vis-à-vis RB—the latter makes fine-tuning operations each afternoon).** To meet their liquidity needs for affecting payments, participants can obtain intraday credit from the central bank, free of interest against eligible collateral.
26. **Intraday credit is provided by means of account overdrafts.** Collateral delivered to RB are held in a pool—in a system called COLIN (which is closely interfaced with RIX); the value of the pool (daily mark-to-market and valuation) sets the maximum credit limit in RIX. Collateral can, where necessary, be added or substituted quickly.
27. **Eligible collateral can be delivered to RB via Euroclear Sweden and via Euroclear Bank (also via links set up by the latter and approved by the Eurosystem).** Subject to entering into an agreement with RB, participants from Denmark and Norway can make use of a so-called Scandinavian Cash Pool (SCP) and pay domestic currency cash to the RB's account with their local NCB (possibly generated against collateral with the central bank concerned); participants may also deposit euros in RB's account with the Deutsche Bundesbank. Once advised, RB assigns (daily) such currencies a collateral value (subject to haircuts) for credit in SEK in RIX.
28. **The stock of eligible assets is very large (only some 1.7 percent of the eligible collateral is held with the central bank).** Moreover, the current collateral framework would allow further assets to be added to the list, should a participant request to do so. RB accepts, subject to a rating threshold, debt instruments issued in OECD countries or currencies.
29. **There is a good flow of payments throughout the day.** The majority of payments are settled in accordance with the “Agreement on domestic settlement and netting between participants in the RIX system.” This includes times at which different types of clearing balances must be settled, which means that participants can plan and forecast when different types of payment will be made. The intraday pattern of payment is shown in Figure 3.
30. **With regard to payments in RIX, payment flows are concentrated, with the four biggest banks accounting for some 75 percent of both value and volume processed.**

Figure 3. Sweden: RIX Traffic—Cumulative Intraday Distribution

(Average for period March 7–11, 2011)



Source: Riksbank.

31. **Under the principles applied for pricing in the RIX system, the system must achieve full cost recovery (including such as fixed and running costs, capital cost, and overhead cost).** RB covers 5 percent of total RIX costs; the rest is collected from participants. Moreover, 75 percent of the cost of the collateral processing system, COLIN, must be paid by the participants.

32. **There is a one-off entry fee of SEK 125,000, a fixed monthly fee of SEK 70,000 for all participants, and an additional fixed fee of SEK 10,000 for all those who wish to receive credit.** The transaction fee is SEK 4.50. In addition, to recover cost, it has been agreed with participants that a monthly sum of SEK 2,650,000 is shared between those institutions with a domestic income above SEK 1 billion. This sum is distributed on the basis of a “key” received once a year from the SBA.

V. CHANGES AND REFORMS IN PROCESS

33. **Since the current RIX system has only been operational for some two years, there are not yet any plans for major changes.**

34. **There are two independent developments under way that may impact RIX in the future.** First, there are considerations being made in RB regarding a possible outsourcing (to a third party) of all information technology (IT) operations—this would affect the location of primary and secondary sites and possibly their staffing. Second, RB together with some other central banks are engaged in a initiative by SWIFT to create a business continuity solution/ service for payment systems using SWIFT communication, however, this work is still at an early stage.

VI. MAIN FINDINGS—SUMMARY

35. **The mission conducted an assessment of the RIX system relative to the CPSIPS and confirmed a high degree of observance of these principles.** The mission's assessment points to opportunities for further improvements in the legal basis and in clearly defining and publicly disclosing its major policies with respect to systemically important payment systems to ensure full adherence to the CP.

36. **Legal foundation (CP I).** There is a generally sound legal basis and clear documentation for the system, with contractual force. Nevertheless, there are some very problematic uncertainties regarding finality and collateral security in Swedish legislation. The Settlement Finality and the Financial Collateral Directives have been transposed into Swedish legislation in a way deviating from what is foreseen in the directives. As a result, there is now certainty as regards netting, finality, and collateral for transactions completed *before* the opening of bankruptcy or reorganization procedures of a participating entity. However, there are uncertainties regarding the treatment of funds transfers and collateral transactions completed *after, but within the same business day* of such a court decision.

37. **Understanding and management of risks (CPs II–III).** As RIX is an RTGS system with central bank money as settlement asset, credit risk does not arise for participants in the system. RB is subject to credit risk to the extent it provides credit to participants; however, this risk is mitigated by it requiring collateral (subject to daily valuation and the application of haircuts) for any credit provided. As a result, the main financial risk to which participants are exposed is liquidity risk. To manage liquidity during the day, participants can obtain intraday credit from RB and they have a number of tools available in the system to control their payment flows.

38. **Settlement (CPs IV–VI).** Individual payments are settled on real-time gross basis in the RIX RTM module or in liquidity-saving mode (but still gross) in one of the five LOMs. Settlement of payments takes place on a first-in first-out (FIFO) basis, but in a queue situation, settlement is in accordance with "FIFO- next first fit bypass." Payments are settled with immediate finality.

39. **Security and operational reliability and contingency arrangements (CP VII).** RIX is a stable and reliable system with a good track record as regards availability. RIX security objectives and policies are documented, implemented, and tested. RIX operational and technical procedures are extensively documented in system documentation. There are two operational centers for RIX, although within limited geographical distance and with no guarantee that there will in all circumstances be staff available to operate the secondary site. Data is replicated in real-time and there is network redundancy between the two sites. There are technical back-up procedures to handle different types of operational interruption in the system. RB regularly organizes contingency testing exercises. Crisis management procedures

are set out in a manual defining decisions, responsibilities and roles played by different actors.

40. **Whereas the RB currently has a business recovery requirement of four hours, in view of increased national and international interdependencies, it may wish to consider moving to a more stringent requirement (such as two hours, as used in some major economies or currency areas).**

41. **Efficiency and practicality of the system (CP VIII).** RIX being a state-of-the-art system, following experience from two years of live operation, its technical operation and business and liquidity management features have been welcomed with satisfaction by its users. There is a good flow of payments throughout the day. Whereas RB has adopted a full cost recovery principle, which is in line with best practice, participants' overall cost (bank internal cost + fixed fees + transaction fee) for making a payment in RIX is relatively high.

42. **Criteria for participation (CP IX).** Access rules to payment and SSS represent an important element in the overall safety and efficiency management of such systems. They provide potential participants advance information, besides on technical matters, on type and regulatory arrangements for the institutions they would face as a participant in the system. The rules for participation in RIX are clear, objective, documented, and publicly available.

43. **Governance of the payment system (CP X).** The RB owns and operates the RIX system. Internal governance arrangements are clearly defined and documented. Documentation providing relevant information on the system and its operations is readily available both internally and to users; it is complete and is being kept up-to-date. The operational and oversight functions of RB are clearly separated. Two external structures ensure users are appropriately involved in issues related to the system and its further development: the RIX Council and the RIX User Group. Many regular monitoring reports are shared with the users—including those on availability and cost recovery. The RB also regularly conducts a customer satisfaction survey.

44. **Central Bank responsibilities in applying the CPSIPS.** As regards the RB's oversight function, information published in 2001 gave an insight into the rationale for oversight, some information on the oversight work and the oversight standard applied. At the time, this was in line with good practice. However, since then, the financial system has gone through a fundamental evolution and become more complex. To provide for transparency and clarity, it will be beneficial to lay out and publish up-to-date and comprehensive information on the RB's oversight objectives and policies, scope of oversight, standards applied and methodologies used, as well as on the distribution of responsibilities and work between the RB and FI.

45. **For a number of years, all systemically important systems have been subject to annual oversight assessments, which have been published in full on RB's website.** Moreover, new systems, products or functions are also subject to an oversight review, but

informally, before their going live. It should be considered to make the proactive reviews more formal and to inform the public of their existence and provide high-level information on the outcome. Formalizing change assessments could also allow for a move to somewhat lower frequency for the conduct of work-intensive, full-scale assessments.

46. **RB lacks formal legal powers in relation to payment, clearing and settlement activities that are not operated by itself, therefore, as regards arrangements operated by other parties it can only use moral suasion in its endeavors to achieve its policy objectives.** It would be desirable to provide in the statute the right to issue regulations (applicable to any relevant parties or activities) in conjunction with the RB's critical payment, clearing and settlement system responsibility, arising from its central banking functions, which inherently underpin monetary policy and financial system stability.

47. **As the Mission's assessment points to opportunities for improved observance on several aspects of the relevant recommendations by the CCP,** the RB and FI are encouraged to take more straightforward positions if and when they identify areas of concern in their assessments of market infrastructures, or in the event identified shortcomings would not be addressed within an appropriate period of time.

48. **Moreover, oversight assessments of the RIX system are conducted by the RB alone, while those of other key infrastructures are conducted jointly with FI.** The cooperation is guided by a high-level Memorandum of Understanding (MoU) between the two, which, however, could be further specified so as to clarify the division of responsibilities in view of avoiding overlaps or gaps in the assessment work.

49. Each recommendation was assessed on a qualitative basis based on a five-fold assessment categorization: observed, broadly observed, partly observed, non-observed, and not applicable. The categorization follows the guidelines in the assessment methodology. As a general principle a recommendation is considered observed whenever all assessment criteria are generally met without any significant deficiencies. A recommendation is considered broadly observed whenever only minor shortcomings are found, which do not raise major concerns and when corrective actions to achieve full observance with the recommendation are scheduled and realistically achievable within a prescribed period of time. A recommendation is considered partly observed whenever the shortcomings are sufficient to raise doubts about the ability to achieve observance within a reasonable time frame. A recommendation is considered non-observed whenever major shortcomings are found in adhering with the assessment criteria. Whenever a recommendation is assessed to be broadly, partly, or non-observed, suggestions are proposed for achieving full observance. Additional suggestions are made to go beyond observance and follow best practice. A recommendation is considered not applicable whenever it is judged not to apply given the structural, legal, and institutional conditions.

Table 3. Sweden: Summary Observance of the CPSIPS and Central Bank Responsibilities in Applying the CPs

Core Principle/Responsibility	Comments
Legal foundation	
CP I – The system should have a well founded legal basis under all relevant jurisdictions.	Important uncertainties remain regarding the treatment of funds transfers and collateral transactions completed <i>after, but within the same business day</i> of a court decision on the opening of bankruptcy or reorganization procedures of a participating entity.
Understand and management of risks	
CP II – The system’s rules and procedures should enable participants to have a clear understanding of the system’s impact on each of the financial risks they incur through participation in it.	System rules and procedures are comprehensive, fully documented and clear.
CP III – The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.	There is no credit risk on payments received in RIX. Access to intraday credit and a number of system tools allow participants to manage their liquidity throughout the day.
Settlement	
CP IV – The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.	The system provides for RTGS with immediate finality.
CP V – A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.	Not applicable.
CP VI – Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.	Transactions are settled in central bank money.
Operational reliability and efficiency	
CP VII – The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.	During its two years in operation RIX has been a stable and reliable system with a good record as regards availability. The secondary site arrangement could be considered as well as moving to a more stringent business recovery requirement (such as two hours).

Core Principle/Responsibility	Comments
CP VIII – The system should provide a means of making payments, which is both practical for its users and efficient for the economy.	The new RIX system has been welcomed with satisfaction by its users. However, participants overall cost for making a payment in RIX is relatively high.
Access and governance	
CP IX – The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.	RIX participation rules are clear, objective and publicly available.
CP X – The system’s governance arrangements should be effective, accountable and transparent.	Internal and external governance is clearly defined, documented and well appreciated by participants.
Central bank responsibilities	
Responsibility A – The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.	It will be beneficial to lay out and publish up-to-date and comprehensive information on the RB’s oversight objectives and policies. Proactive oversight reviews of new system features etc. could be made more formal—this could also allow for a move to somewhat lower frequency for the conduct of work-intensive full-scale assessments.
Responsibility B – The central bank should ensure that the systems it operates comply with the core principles.	Annual assessments of RIX against the CPSIPS are published in full on RB’s website.
Responsibility C – The central bank should oversee observance with the core principles by systems it does not operate and it should have the ability to carry out this oversight.	It would be desirable to provide in the RB’s statute the right to issue regulations (applicable to any relevant parties or activities) in conjunction with its critical payments system responsibility.
Responsibility D – The central bank, in promoting payment system safety and efficiency through the core principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.	In view of avoiding overlaps or gaps in the joint assessment work by RB and FI, further specify the division of responsibilities between the two.

Table 4. Sweden: Detailed Assessment of Observance of CPSS Core Principles for SIPS and Central Bank Responsibilities in Applying the CPs—RIX

CP I - The system should have a well founded legal basis under all relevant jurisdictions.	
Description	<p>The principal laws forming the legal framework for the payment and settlement systems infrastructure in Sweden and relevant for RIX are:</p> <ul style="list-style-type: none"> • The Sveriges Riksbank Act (<i>Lagen om Sveriges Riksbank, 1988:1385</i>). This Act states that the RB shall, inter alia, “promote a safe and efficient payment system.” The RB may make available systems for settlement of payments and in other ways participate in the settlement of payments. It may also grant intraday credit to participants in the system against adequate collateral. A credit institution or any other company supervised by FI has an obligation, upon the request of the RB, to provide the RB with such information as the RB considers necessary in order to fulfill its task to promote a safe and efficient payment system. • The Settlement Systems Act on systems for settlement of obligations on the financial market (<i>Lagen om system för avveckling av förpliktelser på finansmarknaden, 1999:1309</i>). This Act is based on the EU Directive on settlement finality in payment and SSS (98/26/European Commission (EC)). The Act stipulates that a payment order in relation to a third party shall be honored even if insolvency proceedings have been instigated against a participant in a notified settlement system provided the payment order was effected in the system prior to notification of the insolvency proceedings. The act also prohibits revocation of a payment order by a participant in a notified settlement system or by a third party after the time stipulated in the regulations that apply to the system. In RIX, a payment order can be revoked as long as it has not been effected (settled). • The Financial Instruments Accounts Act (<i>Lagen om kontoföring av finansiella instrument, 1998:1479</i>). This Act regulates the registration of ownership of both dematerialized financial instruments and those material instruments which have been taken out of circulation. The responsibility for maintaining the ownership register is assigned to a CSD, which is granted authorization by FI. It also regulates collateral security issues as set out in the Financial Collateral Directive (2002/47/EC). • The Securities Market Act (<i>Lagen om värdepappersmarknaden, 2007:528</i>). This Act contains provisions on investment services, marketplaces for securities trading, and clearing and settlement of securities trading. This act is based on the Markets in Financial Instruments Directive (MiFID), 2004/39/EC). • Banks that conduct banking operations and credit market companies that conduct financing operations are subject to the regulations in the <i>Banking and Financing Business Act</i>. This act states, for instance, what banking and financing business entails, and that banks and credit market companies need a license from FI before they can begin conducting banking or financing business. A banking business is a business that combines the mediation of payments through general payment systems with receiving money (deposits) that may need to be repaid within a maximum of 30 days. A financing business also combines two operations: first, receiving funds from the general public, and, second, offering credit, guaranteeing credit, buying other companies’ claims, or the financial leasing of personal property. In addition to conducting banking or financing

	<p>business, a bank or a credit market company may conduct other financial activities.</p> <ul style="list-style-type: none"> • The <i>Rights of Priority Act (1970:979)</i> stipulates that a pledge, in this case the RB, has a specific right of priority to pledged assets in cases of distraint or bankruptcy. This entitlement means that, where payment of a pledge is involved, the RB need not rank behind any other creditor. • The <i>Bankruptcy Act (1987:672)</i> enables the RB to sell, without delay, any financial instruments it holds as collateral, as long as this is done in a commercially acceptable manner. • The <i>Contracts Act (1915:218)</i> constitutes the legal basis for handling many financial transactions in Sweden. <p>The RB determines the Terms and Conditions for participation in RIX. These are published in the <i>Terms and Conditions for RIX and Monetary Policy Instruments</i> (and its annexes). All participants shall have valid legal status and the capacity to assume with binding effect the rights and obligations ensuing from the Terms and Conditions. Foreign participants have to provide a legal country opinion to evidence that that the terms and conditions for RIX are legal, valid, and binding on them in their jurisdiction.</p> <p>The moment of finality of transfer instructions in RIX is defined in the Terms and Conditions Master Document, Chapter 2.6 on irrevocability and finality (time of crediting of recipient RIX participant's account).</p> <p>The Terms and Conditions set out that RIX is governed by Swedish law. Legislation supports the electronic processing of transactions.</p>
Assessment	Broadly Observed
	<p>Certainty about the soundness of netting, finality and collateral security arrangements is of critical importance for financial infrastructures, markets, and institutions. In Sweden, the legal basis provides for certainty as regards netting, finality and collateral security for transactions completed <i>before</i> the opening of bankruptcy or re-organization of a participant. However, due to the way in which the Settlement Finality and the Financial Collateral Directives have been transposed into Swedish legislation, in deviation from what is foreseen in the directives, there are some very problematic uncertainties regarding the treatment of funds transfer and collateral transactions completed <i>after, but within the same business day</i> of such a court decision.</p>
Comments	<p>As a result of the above, there is now a remaining legal risk that transactions can be challenged. A payment settled after the moment of the court decision may be called back. In transactions involving securities the same applies, however with some nuances. If, for example, a repo transaction is challenged, fund received in exchange for securities have to be returned, i.e., the counterparty is exposed to replacement cost risk (but not principal risk). However, a bankruptcy administrator may conduct so-called cherry picking by allowing favorable contracts hold, while challenging those unfavorable. Moreover, if securities have been provided as collateral, e.g., in a (variation) margin call to a CCP, a risk exists that such collateral is called back.</p>

	<p>These shortcomings have (in December 2010) been pointed out by the RB and some other parties (including FI) to the Ministry of Finance in conjunction with a consultation on amendments to Swedish legislation stemming from the transposition of the Directive 2009/44/EC amending the Settlement Finality Directive and the Financial Collateral Arrangements Directive. The Ministry of Finance is now aware of the shortcoming. Due to procedural rules, the Ministry of Finance could not address the issue in the context of the legal proposal implementing the amendments to SFD and FCD referred to above. The Ministry of Finance is now looking for a way to address the shortcoming at first opportunity.</p>
<p>CP II - The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.</p>	
Description	<p>The rights and obligations of the RB and RIX participants are set out in the Terms and Conditions for RIX and Monetary Policy Instruments. By signing an Accession Agreement with the RB, the participant becomes a counterparty in the manner specified by the Terms and Conditions, i.e., a Counterparty, Monetary Policy Counterparty, or both. The Terms and Conditions (Master Document and Annexes H0 to H9) set out detailed instructions for the participants in the system. They are available to all participants and on the RB's website.</p> <p>The Terms and Conditions cover, inter alia, membership criteria, members' responsibilities, arrangements for withdrawal and exclusion from membership, information on the system's design, operating procedures, its work schedule, the procedures of technical and operational risk management, including business continuity and contingency procedures and governing law. There is no discretion in the rules, except for the crisis manager in considering announcing a delayed closing.</p> <p>Participants can gain access to intraday credit in the system by pledging eligible collateral. The RIX system's operative risk management procedures are described in a separate document, RIX Instructions, Annex A7. Special <i>instructions for dealing with disruptions</i>.</p> <p>New participants, as well as users among existing participants, are offered both theoretical and practical training in the RIX system and its operations. After training and before participants are permitted to access the system, practice exercises are carried out in a test system to verify correct use of the system by the participant.</p> <p>The RB can exclude a RIX participant if that participant breaches any provision in the Terms and Conditions, is declared bankrupt, goes into liquidation, is subject to an intervention pursuant to the Banking and Financing Business Act (2004:297) or if the participant has not commenced using the RIX system within a year, or for any other reason that causes the RB to consider that the participant no longer fulfils the requirements for being a counterparty.</p> <p>Participants in the RIX system can also sign a Settlement Agreement with the SBA (a kind of code of conduct). This specifies the settlement times for different types of payment during the day.</p>
Assessment	Observed
Comments	See comment under CP I.
<p>CP III - The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.</p>	

Description	<p>In RIX payments are settled in central bank money with immediate finality. Information on payments are forwarded to recipients only once settled. As a result, there is no credit risk on payments received in RIX. To ensure that payments can be processed also in abnormal circumstances RIX has extensive business continuity and contingency procedures in place.</p> <p>RB has not made banks subject to a reserve requirement and, thus, banks aim to have a zero balance with the central bank overnight. However, as at mid-March 2011 the banking sector is some 11 billion SEK long vis-à-vis the central bank (neutralized by means of RB fine-tuning operations each afternoon, on request by banks with long positions).</p> <p>To meet their liquidity needs for affecting payments, participants can obtain intraday credit from the central bank, free of interest rate, but against eligible collateral (the SNDO, however, has access to unlimited intraday credit without having to provide collateral—at the same time, there is an arrangement in place with a monetary policy counterpart that ensures it does not remain in a debit position at the end of the day).</p> <p>The stock of eligible assets is very large (only some 1.7 percent of the eligible collateral is held with the central bank). Eligible collateral can be delivered to RB via Euroclear Sweden and via Euroclear Bank (also via links set up by the latter and approved by the Eurosystem).</p> <p>There is also a so-called SCP, in which participants from Denmark and Norway can deposit cash (possibly received as credit against collateral from the central bank concerned) in an account held by the respective central bank in the name of RB. The latter will then receive information on the deposited amount and assign it a collateral value for credit in SEK. Moreover, participants have the possibility to make a cash deposit in euro in an RB account held by Deutsche Bundesbank.</p> <p>For collateral that is registered with Euroclear Sweden, received from the SCP or received from Deutsche Bundesbank, processing is automated, which makes rapid collateral changes possible.</p> <p>Intraday credit is provided by means of account overdrafts. Collateral delivered to RB are held in a pool—in a system called COLIN (which is used for managing collateral for all RB credit operations and is closely interfaced with RIX); the value of the pool sets the maximum credit limit in RIX. Collateral is subject to daily mark-to-market and valuation (re-valuation could, in exceptional circumstances, also be made during the day). Collateral can, where necessary, be added or substituted quickly.</p> <p>Should a participant remain in a debit position at the end of the day it can access the overnight lending facility, at a penalty interest rate (repo rate + 75 basis points).</p> <p>To manage liquidity during the day, participants have a number of tools available. A participant can choose to immediately settle a transaction via its principal account (RTM) or to use one of the five LOMs that exist. Liquidity can be transferred flexibly between the principal account and LOMs, and between LOMs.</p> <p>Payments sent to the principal account are settled only if sufficient funds are available, otherwise the payment is rejected (no queuing). All LOMs have queuing facilities. Priorities can be assigned to payments—such priorities can be changed if the payment gets into a queue. Time codes can be assigned to a payment, indicating either the first or latest time for settlement.</p> <p>Most payments are settled in the RIX-LOM; there are also LOMs for special types of transaction: BGC-LOM (retail settlement), VPC-LOM (securities), OMX-LOM (CCP) and CLS-LOM (foreign exchange). Liquidity can be reserved for individual LOMs and conditions can be set for how settlement is to take place. For the RIX-LOM and BGC-LOM, settlement</p>
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	<p>can take place with the help of optimization procedures (“Gridlock Buster”) by utilizing queued incoming payments in bilateral or multilateral off-setting (in each case the included payments will be settled in a logical block where either all or none of the payments are settled). For other LOMs, the mechanism is primarily used to reserve liquidity for a special settlement cycle or time-critical payments (like those to CLS).</p> <p>The total amount of liquidity moved into an LOM implicitly constitutes a multilateral sender limit. In addition, participants can assign bilateral sender limits for individual participants. Both features allows to control the outflow of liquidity. If a participant has a technical disruption, the RB can stop processing payments sent to that participant (a so-called Stop Receiving) and store the payments concerned in the Conditional Release Mechanism (there is also a Stop Sending facility).</p> <p>Normally, settlement of payments takes place on a FIFO basis, but in a queue situation, settlement is in accordance with “FIFO- next first fit bypass,” which means that any payment in the queue for which there are insufficient funds is bypassed in favor of the next payment for which there are sufficient funds. Participants can prioritize queued transactions.</p> <p>Via a special interface, RIX Online, participants can see their own transactions and position. It is also possible to see queued transactions and to change the priority of a queued payment. Information on collateral and intraday liquidity can also be obtained via the same function. Moreover, the flow of payments is being monitored by RIX operators.</p> <p>RIX participants are responsible for the management of their liquidity in the RIX system. In a Settlement Agreement (a voluntary Code of Conduct) participants have agreed on the times during the day when different types of payment are to be settled. The Settlement Agreement also stipulates the minimum amount of liquidity which users must maintain for settlement of their transactions.</p> <p>If a participant is affected by disturbances that may disrupt the flow of payments in RIX, the participant is required, under the Terms and Conditions, to notify the RB. The RB is thereafter obliged to notify other participants. The RB maintains a help-desk for RIX participants. RIX is open for the processing of payments between 7 a.m. and 5 p.m. The RB has the possibility in abnormal situations to decide to delay the closing to ensure an orderly completion of the business day.</p> <p>A special feature of RIX is that special settlement accounts have been outsourced to Euroclear Sweden in view of allowing integrated DvP settlement in central bank money of securities and cash in the Euroclear Sweden system. RIX participants move liquidity to the Euroclear Sweden system via the VPC-LOM. It is also possible to generate intraday credit in the Euroclear Sweden system, subject to the same rules, collateral and procedures as applied by RB (data on such intraday credit is transmitted to RB on a continuous high-frequency basis). During the day, integrated settlement is available until 2 p.m., after which the central bank money balances are moved back into the RIX system (which closes at 5 p.m.). Should a Euroclear Sweden participant be unable to reimburse in full any intraday credit generated (within the Euroclear Sweden system) by 2 p.m., then the collateral used will be moved to COLIN and the outstanding credit position be moved to RIX. Procedures are in place to ensure an orderly closure of the business day. The arrangement is tightly controlled by the RB.</p>
Assessment	Observed

Comments	
CP IV - The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.	
Description	Individual payments are settled on real-time gross basis in the RIX RTM module, or in liquidity saving mode in one of the five LOMs. Payments are settled with immediate finality.
Assessment	Observed
Comments	See also comments under CP 1.
CP V - A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.	
Description	Payments in RIX are settled on a gross basis.
Assessment	Not applicable
Comments	
CP VI – Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.	
Description	Settlement of payments in RIX takes place in central bank money.
Assessment	Observed
Comments	
CP VII - The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.	
Description	<p>RIX is a system that was developed by SIA-SSB / Perago. RB has bought the system on the basis of a license (RB also has a copy of the software code). RB is free to ask the supplier to develop new features or functionalities. RB has a certain degree of freedom on the timing and installation of new versions provided by the supplier.</p> <p>The RB's IT Department is responsible for the technical operation of the system and for ensuring that it meets set security and security management criteria. The RIX Division of the Asset Management Department of the RB is responsible for the business operation part of the system. There are Service Level Agreements (SLA) between the RB and the system provider on the one hand and between Asset Management Department and the IT Department on the other.</p> <p>Security</p> <p>RIX security objectives and policies are based on those applied by RB for IT systems and are reviewed periodically. The RB's information security measures comply with the European System on Central Banks Information Risk Management Baseline Security Catalogue (based on <i>Code of Practice for Information Security Management - ISO/IEC 27002:2005</i>). They also cover issues like confidentiality, integrity, authentication, nonrepudability, availability, and audit ability. RIX is subject to regular risk analysis.</p> <p>Since the system supplier is not in Sweden, it has the possibility, via remote access, to carry out fault localization and correct acute faults in the system. Special measures have been taken to ensure that the security of this solution is acceptable.</p>

RIX security objectives and policies are documented, implemented and tested.

Operational reliability

Participants communicate with the RIX system by sending and receiving messages through the SWIFT network. SWIFT is subject to cooperative oversight (with the involvement of RB), one of the focus areas being operational reliability. Participants can also communicate with RIX, via RIX online, using a dedicated network (leased lines) or through internet access. This provides for redundancy in the communication with the system. In addition, there is a possibility for a participant to come to the RB premises to insert transactions through a dedicated workstation.

RIX operational and technical procedures are extensively documented in system documentation (Annex H3—RIX instructions).

The RIX system's operative risk management procedures are described in a separate document, RIX Instructions, Annex A7. Special *instructions for dealing with disruptions*.

The volume of payments in the RIX system has risen steadily in recent years and, at the end of 2010, around 12 000 payments were settled per day. However, during peak-days more than 18,000 payments are processed. Moreover, a large number of payments are processed within a limited time in the morning (between 9:00 a.m. and 10:00 a.m.), which means the system's capacity was calibrated accordingly. The system has a maximum processing capacity of 36,000 payments per hour. Thus, if there was to be an interruption during any time of the day, pending payments can be processed rapidly, allowing for a swift return to normal processing.

System availability requirements are regulated in an agreement between the system owner and the supplier, and with the IT Department at the RB. Incidents in the RIX system and its communication channels are reported and investigated continuously (in line with procedures set out in an Incident Management Manual). The target set for availability in the RIX system is 99.85 percent availability on a yearly basis (availability is calculated as the total time that RIX is open in minutes minus the period in minutes in which there were disturbances in the system divided by the total opening time in minutes). As no major outages occurred the availability target was achieved in both 2009 and 2010 (the availability was 99.98 percent and 99.93 percent, respectively).

The system owner, its participants and the IT Department sometimes call for modifications to the system. Clear procedures are in place for the ordering, new development, testing and approval of system modifications (documented in RB's Release- and Change Process document). The RB conducts thorough testing of system changes before they are brought into operation.

The Internal Audit Department (which reports to the Executive Board of the RB) carries out regular reviews of individual parts of the system and also follows up the audit reports. External IT-Security Auditors are used regularly in evaluations.

RIX is subject to regular risk assessments. RB has also made assessments of all participants' organization, staffing, access rights control and contingency procedures.

RIX settlement managers and operators are trained, familiar with the operating routines and knowledgeable about the system requirements for availability, which is important in abnormal situations and ensures incidents always receive highest priority if and when arising. The RIX system is operated by a relatively small staff, which cannot be further reduced without adding risk. The IT Department has a separate team for the technical operation of the system. In the event of a failure in the application, the RB is dependent on support from the supplier, which is not available in Stockholm. During occasions when support was needed, it

has functioned well.

Business continuity

There are two operational centers for RIX. The secondary site is located some four kilometers away from the primary site and is reliant on staff moving from the primary site. Data is replicated in real-time and there is network redundancy between the two sites. Site 2 can be operated remotely from Site 1 and vice versa. A third site, located some 80 kilometers away has no independent equipment but allows both the primary and secondary sites to be operated remotely.

There are technical back-up procedures to handle different types of operational interruption in the system, depending on the reasons. One of these is the RIX Online procedure, which makes it possible for the participants to manually register transactions in the system. In the event of an internal disruption, participants are also able to use reserve terminals at the RB to register their transactions. Specific back-up procedures (a PC-based “Extreme Contingency Facility”—account data is continuously fed real-time to this facility) exist to process a limited number of payments whose settlement is critical, such as payments relating to CLS (effected according to an internationally-agreed schedule). This facility can process some 30 payments per hour (banks also have the possibility to aggregate payments so as to reduce the number of transfers to be processed).

Where necessary, the RB may decide to transfer the operation of the RIX system to the secondary site and continue operations there. Various failover tests (also involving participants) have been regularly carried out and worked well. In the event of a failure at the primary site, the current requirement is that the secondary is fully operational within four hours from when the problem arises. The Extreme Contingency Facility can be used in the event there is a problem which would not be solved by moving processing to the secondary site.

The RB regularly organizes contingency testing exercises with the aim to give itself and all participants knowledge and confidence to handle various incidents in RIX. Manual contingency routines are tested twice a year with different scenarios (the latter have been made as realistic as possible in close cooperation with participants). Input of payments via the terminals located at the RB are done once a year. RIX Online use is tested twice a year and SWIFT contingency once a year.

The RB is also actively contributing to the work of a on Financial System Private and Public Sector Forum (with various Working Groups), composed of the core actors in the payment system (including RB, FI, the National Debt Office, the SBA, the four big banks). It deals with key business continuity issues in the financial sector, from a payment system viewpoint.

There are two independent developments under way that may impact RIX business continuity arrangements in the future. First, they are considerations being made in RB regarding a possible outsourcing (to a third party) of all IT operations—this would affect the location of primary and secondary sites and possibly their staffing. Second, RB together with some other central banks are engaged in a initiative by SWIFT to create a business continuity solution/service for payment systems using SWIFT communication, involving SWIFT providing an RTGS system with essential but limited functionality. This work is at an early stage.

Crisis management

Crisis management procedures are set out in a manual defining decisions, responsibilities and roles played by different actors. Escalation procedures are defined as well as internal and

	external communication procedures. Communication with participants takes place through the system or via a conference call facility. A “basic agenda for telephone conferences in the event of disruptions to RIX” is readily available. Incident classifications and procedures have been identified in advance—also for how to end the crisis management.
Assessment	Observed
Comments	<p>The limited distance (four kilometers) between the two operating sites implies that full compliance with best practice (of the locations of the two sites having different risk profiles) is not undisputed. Moreover, the secondary site is currently dependent on being staffed by personnel from the RB’s primary site, implying that should the latter be destroyed for whatever reason, there is no guarantee that there will be staff available to operate the secondary site.</p> <p>Whereas the RB currently has a business recovery requirement of four hours, in view of increased national and international interdependencies, it may wish to consider moving to a more stringent requirement (such as two hours, as used in some major economies or currency areas).</p> <p>While the situation described above may still be in line with the requirements of CP VII as developed in year 2000, considering that RIX is the backbone of the Swedish market infrastructure, the lack of a staffed / hot standby, the limited distance between the primary and secondary sites as well as the four hours business recovery requirement would no longer seem to be in line with best business practice.</p>
CP VIII - The system should provide a means of making payments, which is practical for its users and efficient for the economy.	
Description	<p>To meet evolving needs of the financial system and of its participants, the RB introduced a new RIX system in February 2009. The RIX system, owned and operated by RB and providing for settlement in central bank money with intraday finality of SEK payments, is the backbone for all payment and settlement activities in Sweden. In addition to interbank (and customer) payments, RIX also provides for the settlement of cash positions arising from retail payments clearing (BGC), securities settlement (Euroclear Sweden), derivatives and repo clearing or settlement (NASDAQ-OMX), and foreign exchange settlement (CLS).</p> <p>Prior to the issuance of a Request for Proposals, RB had extensive discussions with users to determine their needs and the business and technical features a new system should provide. Being a state-of-the-art system, following experience from two years of live operation, its technical operation and business and liquidity management features have been welcomed by its users.</p> <p>Payments can be introduced into RIX for settlement at any time during the system’s opening hours. It is also possible to make timed payments. There are no limits on amounts in the system. Participants can choose if a payment is to be settled in a real-time gross or liquidity saving mode and they can reserve liquidity (in LOMs) for different settlement purposes. Through the RIX Online function in the RIX system, participants can retrieve information about and change priorities for queued payments. The function can also be used to manually register payments in the system, for example if there is an interruption in the SWIFT communication.</p> <p>There is a good flow of payments throughout the day. The majority of payments are settled in accordance with the “Agreement on domestic settlement and netting between participants in the RIX system” (the Settlement Agreement), drawn up by the SBA (clearing organizations and the SNDO are not bound by the Agreement). This includes times at which different types</p>

	<p>of clearing balances must be settled, which means that participants can plan and forecast when different types of payment will be made. It is very exceptional that a payment entered into the system would not be settled by the end of the day.</p> <p>Message formats for payment orders in RIX follow the SWIFT international standard, which is also the message format used in many of the banks' internal systems and in their interfaces with other market infrastructures, thereby making Straight Through Processing (STP) possible, which makes the payment flow more effective and secure.</p> <p>Intraday credit is available to RIX participants against eligible collateral. Collateral is held in a pool in the COLIN system, which allows participants to manage their collateral simply, rapidly and securely, and flexibly change their liquidity (credit line) in the RIX system.</p> <p>Under the principles applied for pricing in the RIX system, the system must achieve full cost recovery (including such as fixed and running costs, capital cost and overhead cost). Costs should be recovered (on average) over a three years period. The cost of the collateral processing system, COLIN, must also be paid by the participants. There is a one-off entry fee of SEK 125,000, a fixed monthly fee of SEK 70,000 for all participants and an additional fixed fee of SEK 10,000 for all those who wish to receive credit. The transaction fee is SEK 4.50. In addition, to recover cost, it has been agreed with participants that an additional monthly sum of SEK 2,650,000 is distributed among those institutions having a domestic income above SEK 1 billion. The sum is distributed on the basis of a “key” received once a year from the SBA. The RB’s costs for notification messages (via SWIFT) to individual participants are charged twice a year. RB also offers an “access right administration” service to interested participants the fee of which varies from SEK 1,000 to 4,000 (depending on the number of users). The total annual cost to be recovered is some SEK 66 million. RB covers 5 percent of the RIX costs and 25 percent of the COLIN costs. (As at mid-March 2011, 1 euro = SEK 8.91).</p> <p>Due to the way in which the fee structure is set, cost recovery has been good. Information on cost recovery is made available to participants and the public. In 2009 the cost recovery rate was 94 percent, in 2010 98.2 percent (in 2011 it is expected to be some 106 percent).</p>
Assessment	Observed
Comments	Whereas RB has adopted a full cost recovery principle, which is in line with best practice, participants overall cost (bank internal cost + fixed fees + transaction fee) for making a payment in RIX is relatively high.
CP IX - The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.	
Description	<p>Access criteria for participation in RIX are stipulated in the Terms and Conditions for RIX and Monetary Policy Instruments (“Terms and Conditions”), which are available on the RB website.</p> <p>The RB accepts the following categories of institutions as participants in RIX:</p> <ul style="list-style-type: none"> • credit institutions (according to EU definition); • investment firms (provided that they are permitted to trade in financial instruments or to provide guarantees in connection with issues of securities); • clearing organizations; and • the SNDO.

	<p>The qualifying criteria (as set out in the Terms and Conditions, annex H9) to be met for an institution to be admitted as a participant include compliance with capital adequacy and large exposure requirements applicable within the European Economic Area (EEA), being subject to supervision, having an appropriate organization, necessary systems and routines for risk management, and secure technical systems. In addition, the institution shall have a valid license. An institution which has its registered office outside Sweden must be prepared to provide a statement (legal (country) opinion) regarding legal acts in the applicant's country of domicile with significance for the validity, application, and enforceability of the RIX regulations in that country. All RIX participants must meet technical equipment and communications requirements.</p> <p>Instead of choosing to become a participant in the RIX system, an institution may opt instead to become a customer of a RIX participant, which will then act as banker (agent) for that institution. The institution will then have no relationship with the RB. This arrangement is frequent in the Swedish financial market.</p> <p>The RB must process applications for participation in the RIX system in accordance with the principles of <i>freedom of access</i> and <i>impartiality</i>. In conjunction with the admission of new participants to the RIX system, they are informed of the SBAs Settlement Agreement, which is described briefly under CP VIII.</p> <p>As of mid-March 2011 RIX had 24 participants, including the RB. Of these, 17 were credit institutions, including six branches of foreign banks. The other institutions were BGC, Euroclear Sweden, EMCF, NASDAQ OMX, and the SNDO. RIX is open to remote participants, i.e., for participants without domicile in Sweden. Currently the only remote participant is CLS Bank.</p>
Assessment	Observed
Comments	
CP X – The system's governance arrangements should be effective, accountable and transparent.	
Description	<p>The RB owns and operates the RIX system. The Executive Board of the RB has the overall responsibility for RIX and takes decisions, for example concerning major investments in the system and operating sites. The Head of the Asset Management Department has been assigned as "system owner" and in this capacity decides on the Terms and Conditions of the RIX system, including the pricing scheme applied. The RIX Management Committee (chaired by the Head of the Asset Management Department) is an RB internal decision-making body for RIX, which is consulted on all important issues before their submission to the Executive Board, and which plays an important role in the RB information dissemination and decision making in crisis situations (see also CP VII). Issues that are of a legal nature are considered by an internal Committee on Legal Framework.</p> <p>The operation, development and management of RIX are the responsibility of the head of the Asset Management Department. The technical operation of the system is carried out by the RB's IT Department, while the business management is the responsibility of the RIX Division of the Asset Management Department. Technical operation is regulated by an SLA between the departments. Development and modifications to the application are handled by the supplier, SIA-SSB, and is the subject of an SLA.</p>

	<p>Documentation providing relevant information on the system and its operations is readily available both internally and to users, it is complete and is being kept up-to-date. RIX is subject to audit by the RB Internal Audit Department which regularly involves external IT-Security auditors. RIX is subject to oversight. The operational and oversight functions are clearly separated—the latter is part of the Financial Stability Department.</p> <p>Two external structures have been set up to ensure users are appropriately involved in issues related to the system and its further development. Merely policy and strategic issues are discussed in the RIX Council, which is a consultative body between the RB and the participants. It is composed of representatives of the major banks, clearing organizations, the National Debt Office and the SBA—the RB holds the chair (Head of the Asset Management Department). The RIX Council meets about two times a year (at the time the new system was implemented, there was a much higher frequency of meeting). Operational and technical issues are discussed in the RIX User Group in which all participants are represented—a bank provides the chairperson. Meetings are normally held quarterly. Meeting agendas and meeting summaries are prepared for both groups. Important policy, operational or technical changes are normally submitted for a 30-day consultation to all participants.</p> <p>RB has also from time to time set up ad-hoc groups with users to deal with specific issues, e.g., on some projects, testing and migration and on business continuity rehearsals.</p> <p>RIX functioning is continuously monitored and reported. Many monitoring reports are also shared with the users—including those on availability and cost recovery. RB also regularly conducts a customer satisfaction survey.</p>
Assessment	Observed
Comments	
Central Bank Responsibilities in applying the CPSIPS	
<i>Responsibility A – The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.</i>	
Description	<p>The RB’s responsibilities in respect to the payments system and its various components are formulated in very general terms in the Sveriges Riksbank Act.</p> <p>In Chapter 1 (Objective and governance), Article 2, it is stated that “Pursuant to Chapter 9, Article 13 of the Instrument of Government, the Riksbank is responsible for monetary policy. The objective of the Riksbank's activities shall be to maintain price stability.</p> <p>The Riksbank shall also promote a safe and efficient payments system.</p> <p>The Riksbank may issue regulations within the scope of its responsibility for monetary policy. The Riksbank may also issue regulations that concern activities connected with the Riksbank’s payment system or cash-provision mandate.”</p> <p>Moreover, Chapter 6 (Monetary policy and the payment system), Article 7 states that “The Riksbank may make available systems for settlement of payments and participate in other ways in the settlement of payments.</p> <p>In order to promote the function of the payment system, the Riksbank may grant intraday credit to participants in the system. Credit may only be granted against adequate collateral. The State does not need to provide collateral.”</p> <p>In Sweden the provision “promote a safe and efficient payments system” is seen as a mandate for RB’s work on financial stability (i.e. to promote the stability of the Swedish financial</p>

	<p>system). The last indent in Article 2 (of Chapter 1) provides regulatory powers to RB regarding issues related to systems operated by itself. FI, as banking supervisor and securities regulator, has regulatory powers on “institutions” that provide clearing and settlement services (e.g., operators (other than RB) of retail payment systems, clearing houses, and securities settlement systems).</p> <p>The RB’s oversight function is closely embedded into its internationally appreciated financial stability function. A high-level explanation of the RB’s <i>rationale</i> for oversight of financial infrastructure was provided in an article published in its Economic Review No. 3/2001. Moreover, an extensive article entitled “Oversight of the financial infrastructure and financial stability” published in its Financial Stability Review 2/2001, provided information on various risks in payment, clearing and settlement activities, the RB’s oversight as well as international standard and methodology applied (at the time only CPSIPS).</p> <p>Subsequently, some fragmented information on the RB’s oversight considerations and international standards applied in assessments of various systemically important market infrastructures have from time to time been provided in its Financial Stability Reviews.</p> <p>A more comprehensive reference to oversight issues was provided in the Financial Stability Report from 2007, by noting that the RB’s oversight and assessment of the financial infrastructure is an important component of the Bank’s work on financial stability. It pointed out that the financial infrastructure includes the institutions and systems that enable payments and financial transactions and is accordingly a central component of the payment system and that oversight involves identifying weaknesses in the infrastructure that may either lead directly to disruptions in the financial system or contribute to problems for one participant or submarket spreading to others. It does not however elaborate on policy. The text also referred to the international standards applied in assessments and gave an insight into the main findings for each of the overseen systems at the time: RIX, VPC (securities settlement), the Stockholm Stock Exchange (as a CCP), and BGC (clearing house for retail payments).</p> <p>For a number of years, for all systems covered, annual oversight assessments have been published in full on RB’s website. Moreover, in view of proactive oversight new systems, products or functions are also subject to an oversight review, but informally, before their going live and no reference to them is made in public documents. Keeping change reviews informal and nonpublic does not allow for full visibility and transparency of the oversight work.</p>
	<p>RB holds regular (quarterly) meetings with the overseen entities and as part of the assessment processes. In such meetings, it has informed the entities concerned about the oversight standard to be applied in the next assessment.</p>
Assessment	Broadly Observed
Comments	<p>There is clear evidence the RB itself has a good understanding of its oversight function. Information published in 2001 gave an insight into the rationale for oversight, some information on the oversight work and the oversight standard applied. At the time, this was in line with good practice.</p> <p>However, since then the financial system has gone through a fundamental evolution and become more complex, which also applies to the payment and settlement business, products and processes, and market infrastructures for payments and financial instruments. In some of the oversight related texts published in the FSR over the last eight years, reference has sometimes been made to subjects which for this reason could be believed to be within the scope of oversight although they are not (e.g., payment instruments, trading (of financial</p>

	<p>instruments) and the RB banknote handling services).</p> <p>Oversight being deeply integrated into general financial stability work the specific and up-to-date oversight policies, modalities and border lines have not been set out clearly, nor made public. To provide for transparency and clarity, it will be beneficial to lay out and publish up-to-date and comprehensive information on the RB's oversight objectives and policies, scope of oversight, standards applied and methodologies used, as well as on the distribution of responsibilities and work between the RB and FI.</p> <p>Conducting oversight reviews of changes to status quo is very important and a welcome good practice. It should be considered to make the proactive reviews more formal and to inform the public of their existence, including high-level information on the outcome. Formalizing change assessments could also allow for a move to somewhat lower frequency for the conduct of work-intensive full-scale assessments.</p> <p>See also comments under Responsibility C.</p>
<p>Responsibility B – The central bank should ensure that the systems it operates comply with the CP.</p>	
Description	<p>RB has already for a long time subjected its RIX system to oversight. Since 2001 the oversight standard applied has been the CPSIPS.</p> <p>Besides regular assessments, oversight evaluations have also been made before introducing to live operation any material changes to the system. Such evaluation was also made for the new RIX system before its going live in February 2009.</p> <p>Annual assessments of RIX against the CPSIPS are published in full on RB's website.</p>
Assessment	Observed
Comments	
<p>Responsibility C – The central bank should oversee observance with the CP by systems it does not operate and it should have the ability to carry out this oversight.</p>	
Description	<p>BGC operates an ACH function for retail payments. Net settlement positions arising in BGC are settled in RIX.</p> <p>The risk exposures arising in BGC are of a value not likely to result in systemic risk. Because of its vital role in ensuring the smooth flow of payments in the Swedish economy, however, and the lack of a substitute system, the RB has made it subject to oversight according to the CPSIPS.</p> <p>BGC is subject to joint assessments by RB and FI. Oversight assessments of BGC are currently conducted annually, with assessments being made public in their entirety. Oversight evaluations of any material changes are also made before being introduced to live operation in the BGC system (such reviews are informal and are not made public).</p> <p>Besides assessing systems observance of the CPSIPS, the RB and FI jointly assess compliance with the “European System of Central Banks (ESCB)—Committee of European Securities Regulators (CESR) Recommendations for SSS and CCPs in the EU” of relevant systems. RB and FI have, however, by definition slightly different perspectives: FI focus is on the soundness of “institutions” and on investor protection, while RB overseers focus on the soundness of “systems” (including clearing and settlement procedures and systemic risk).</p> <p>According to its statute (the Sveriges Riksbank Act), the RB has the task to promote a safe and efficient payment system. The Statute allows the RB to issue regulations that concern activities connected with RB's own payment system. However, the RB lacks formal legal</p>

	<p>powers in relation to payment, clearing and settlement activities that are not operated by itself, therefore, as regards arrangements operated by other parties it can only use moral suasion in its endeavors to achieve its policy objectives (this is also the reason why RB conducts oversight assessments of such systems together with FI).</p> <p>Following the financial crisis, the RB took in 2009 the initiative to ask the legislator to review the RB Act in respect of, i.e., the tools available to fulfill its financial stability (including payment system oversight) mandate. A Committee established for this purpose has recently started its work.</p>
Assessment	Observed
Comments	<p>A strengthening of RB's legal powers in payments system issues would be highly welcome. In particular, it would be desirable to provide in the statute the right to issue regulations applicable to any relevant parties or activities (i.e. not just limited to RB's own systems) in conjunction with the RB's critical payment, clearing and settlement system responsibility, arising from its central banking functions which inherently underpin monetary policy and financial system stability. While the achievement of progress in safety and efficiency of financial market infrastructure issues on the basis of moral suasion is to be preferred, the existence of formal authority may in some circumstances be a precondition for the effective enforcement, where necessary, of the central banks payment, clearing and settlement arrangement objectives and policies.</p> <p>During the FSAP Mission to Sweden also a detailed assessment of observance with the CPSS-IOSCO Recommendations for central counterparties was made for the Swedish CCP. The Mission's assessment point to opportunities for improved observance on several aspects of the relevant recommendations by the CCP. RB and FI are encouraged to take more straightforward positions if and when they identify areas of concern in their assessments of market infrastructures, or in the event identified shortcomings would not be addressed within an appropriate period of time.</p>
<p>Responsibility D – The central bank, in promoting payment system safety and efficiency through the CP, should cooperate with other central banks and with any other relevant domestic or foreign authorities.</p>	
Description	<p>RB has well established and good relations with other national authorities. In promoting safety and efficiency of market infrastructures it cooperates closely with FI. It contributes to the development of the Swedish financial markets legislation in interaction with the Ministries of Finance and Justice. It also interacts with the competition authority and with the consumer protection authority.</p> <p>The RB has close and frequent contact with its European and G20 counterparts both through formal mechanisms—in particular G20 (CPSS), ESCB and EU committees—and ad hoc contacts. It takes part in the Nordic-Baltic central bank cooperation and contributes to technical assistance in the field of payment, clearing and settlement issues to many countries world-wide.</p> <p>The RB is party to a number of EU MoUs between central banks and other authorities, including to the MoU between Payment Systems Overseers and Banking Supervisors in Stage Three of Economic and Monetary Union. This MoU is aimed at promoting cooperation and information sharing between EU payment overseers and banking supervisors in relation to large-value interbank transfer systems with a view to ensuring the soundness and stability of such systems and of their participating credit institutions.</p> <p>Finally, the RB is party to a number of international cooperative oversight arrangements (e.g., for CLS, EMCF, Euroclear and SWIFT).</p>

Assessment	Observed
Comments	Oversight assessments of the RIX system are conducted by the RB alone, while those of other key infrastructures are conducted jointly with FI. The cooperation is guided by a high-level MoU between the two, which, however, could be further specified so as to clarify the division of responsibilities in view of avoiding overlaps or gaps in the assessment work.

Table 5. Sweden: Summary Observance of CPSS Core Principles and Central Bank Responsibilities in Applying the CPs—RIX

Assessment Grade	Principles Grouped by Assessment Grade	
	Count	List
Observed	8 + 3	CP I, II, III, IV, VI, VII, VIII; Responsibilities B - D
Broadly observed	1 + 1	CP I and Responsibility A
Partly observed	-	
Non-observed	-	
Not applicable	1	CP V

VII. RECOMMENDED ACTIONS AND AUTHORITIES' RESPONSE TO THE ASSESSMENT

Recommended actions

50. **The mission conducted an assessment of the RIX system relative to the CPSIPS and confirmed a high degree of observance of these principles.** The mission's assessment points to opportunities for further improvements in the legal basis and in clearly defining and publicly disclosing its major policies with respect to systemically important payment systems to ensure full adherence to the CP. Furthermore, while the mission's assessment points to observance of a CP or central bank Responsibility in areas other than the above, attention should nevertheless be paid to the following issues.

Table 6. Sweden: Recommended Actions to Improve Observance of CPSS Core Principles and Central Bank Responsibilities in Applying the CPs—RIX

Reference principle	Recommended action
Legal foundation	<p>CP I: Due to the way in which the Settlement Finality and the Financial Collateral Directives have been transposed into Swedish legislation, in deviation from what is foreseen in the directives there are some very problematic uncertainties regarding the treatment of funds transfer and collateral transactions completed <i>after, but within the same business day</i> of such a court decision.</p> <p>Authorities to address at first opportunity problems in legislation related to finality and collateral security.</p>
Understanding and management of risks	
Settlement	
Security and operational reliability, and contingency arrangements	<p>CP VII: Whereas the RB currently has a business recovery requirement of four hours, in view of increased national and international interdependencies, compliance with best practice would suggest moving to a more stringent requirement. Consider implementing a business recovery requirement of two hours for RIX.</p>
<p>Central bank responsibilities in applying the CPs</p> <p>Responsibility A</p>	<ul style="list-style-type: none"> • To provide for transparency and clarity on its oversight function, it will be beneficial to lay out and publish up-to-date and comprehensive information on the RB's oversight objectives and policies, scope of oversight, standards applied and methodologies used, as well as on the distribution of responsibilities and work between the RB and FI. • In view of proactive oversight, new systems, products or functions are being reviewed, but informally, before their going live and no reference to them is made in public documents. It is recommended to formalize change assessments, and consider moving to somewhat lower frequency for the conduct of work-intensive full-scale assessments.

Reference principle	Recommended action
Responsibility C	<ul style="list-style-type: none"> • RB has few formal legal powers in relation to payments system issues and can only use moral suasion in its endeavors to achieve its oversight objectives. It will be beneficial to provide in the RB's statute the right to issue regulations in conjunction with its critical payments system responsibility. • Further specify the MoU between RB and FI in view of avoiding overlaps or gaps in the assessment of key market infrastructures. • In assessing market infrastructures against oversight standards, RB (and FI) should take more straightforward positions when areas of concern are identified, or in the event identified shortcomings would not be addressed within an appropriate period of time.

Authorities response

51. The Swedish authorities welcome the detailed assessment of the RIX system conducted by the IMF. We highly appreciate the insights and suggestions for improvements and overall we share the views expressed. The Swedish authorities would like to extend the following comments to some of the views highlighted in the assessment.

Core Principle I – Legal foundation

52. As mentioned in the assessment, several authorities have highlighted perceived shortcomings in current law, and the Ministry of Finance is looking for a way to address these issues at first opportunity.

Core Principle VII –Operational risk

53. The Swedish authorities agree that the demands on security, operational reliability and contingency must be extremely high due to the RIX system's importance for the Swedish financial market. However, the demands must be feasible and in accordance with the central bank's size and resources. But in line with the recommendation from the IMF, improvements may be made and the Swedish authorities will request the operator of the RIX system to include the recommendations from the IMF in their current analysis on how the contingency arrangements for RIX can be strengthened.

Central banks responsibility A in applying the Core Principles

54. The Swedish authorities agree with the recommendations and work has been initiated that aims to make the oversight of the financial infrastructure more efficient and clear. The aim of such work is to publish a paper with comprehensive information regarding the Riksbank's oversight role and to describe the roles of the Riksbank and Finansinspektionen.