
Liquidity of Danmarks Nationalbank and the Banks

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INTRODUCTION AND SUMMARY

Typically, bank liquidity contracts in times of financial crisis. Banks find it increasingly difficult to raise loans in the money and capital markets because confidence in the financial system is diminishing and financial market liquidity is declining. A shortage of liquidity in the banking sector may lead to financial instability and to systemic crises with severe adverse consequences for the real economy.

It is a core central-bank task to ensure that banks have access to sufficient liquidity. During a financial crisis, when banks have difficulties obtaining loans due to dysfunctional money and capital markets, central banks may step in to support bank liquidity e.g. by increasing lending. Therefore, amid financial crises, part of the banks' normal placement and borrowing activities in the money and capital markets may instead be conducted with the central bank.

Since 2008 and in order to promote financial stability, Danmarks Nationalbank – like a number of other central banks – has taken various steps to support the banks' liquidity. Most recently, Danmarks Nationalbank has introduced two separate measures. Firstly, the collateral basis has been expanded to include the banks' credit claims of good quality. Secondly, Danmarks Nationalbank's credit facilities have been expanded to include 3-year loans secured by Danmarks Nationalbank's entire collateral basis. The measures are aimed at improving the banks' access to liquidity and ease the transition when the individual government guarantees expire in 2012-13. Furthermore, in 2011 Danmarks Nationalbank introduced 6-month loans and temporarily expanded its collateral basis to include shares in the companies jointly owned by the banks.

All banks may use these measures and there is no limit to the amount they can borrow from Danmarks Nationalbank. This offers the banks maximum security in terms of obtaining the liquidity they want in times of generally difficult financing conditions and supports confidence in the banks to the best possible extent.

Danmarks Nationalbank's most recent measures are aimed at the banks' liquidity, meaning their ability to raise funding. Danish monetary policy normally focuses on liquidity in the form of banks' demand deposits with Danmarks Nationalbank.

WHAT IS LIQUIDITY?

A bank's liquidity may be defined as its ability to make payments whenever they are required. The definition relates to the ability to obtain funding and the concept is normally referred to as funding liquidity. This type of liquidity is closely related to market liquidity, cf. Box 1 on various liquidity concepts and their interaction. The funding possibilities available to a bank largely depend on liquidity conditions and risk premia in the financial markets. This applies to both issuance of new debt instruments and sales of assets.

In times of ample market liquidity and easy access to market funding, liquidity in the financial system is for the most part provided via banks and other market players. Thus, the level of liquidity depends on the level of trust among market players and the liquidity conditions in the financial markets, cf. Domanski et al. (2011). When banks are confident that they can obtain sufficient funding, they become more inclined to grant loans and create liquidity. If the creation of liquidity among private market players comes to a halt, central banks may step in by expanding the banks' credit facilities at the central bank. The central bank can determine loan terms independently of the level of confidence among the private market players.

It is a core central-bank task to ensure a sufficient supply of liquidity in the financial system. In times of crisis, when market confidence and liquidity may deteriorate significantly, it is vital that the central banks ensure that the banks are able to obtain enough liquidity. Therefore, part of the banks' normal placement and borrowing activities in the money and capital markets may instead be conducted with the central bank.

CENTRAL-BANK MEASURES TO SUPPORT LIQUIDITY

Since the onset of the financial crisis, numerous central banks have introduced a number of extraordinary measures to increase confidence among banks that they will be able to obtain the liquidity they need.

The central banks have, among other things, increased the supply of longer-term loans and expanded their collateral basis as well as the number of counterparties with access to central-bank instruments.

LIQUIDITY CONCEPTS¹

Box 1

Funding liquidity

Funding liquidity is an expression of the ability to make payments when needed. The Basel Committee on Banking Supervision, BCBS, defines a bank's funding liquidity as its ability to fund increases in assets and meet obligations as they come due without incurring unreasonably heavy losses, cf. BCBS (2008). As indicated by the definition, banks' funding liquidity relates to their entire balance sheet.

On the assets side, banks may use their liquidity buffers. They may, for instance, draw on demand deposits with other banks or the central bank, or they may sell securities. On the liabilities side, banks may raise loans in the money and capital markets or directly from the central bank.

Market liquidity

Market liquidity is an expression related to an asset. A high level of market liquidity reflects the possibility of trading large amounts in a financial asset quickly without any significant price effect. By contrast, a low level of market liquidity means that trading affects prices even where the amounts involved are limited.

Relationship between funding and market liquidity

Funding liquidity and market liquidity are closely linked. When the market liquidity of assets held by a bank falls, the possibility of obtaining funding liquidity by selling or pledging assets as collateral diminishes. Funding liquidity may also affect market liquidity. If funding liquidity for key participants in the financial markets deteriorates, their capacity to operate in the financial markets also deteriorates, and consequently market liquidity is reduced. This may give rise to negative liquidity spirals in times of crisis when negative shocks to funding liquidity, e.g. from loss of confidence in the financial sector, reduce market liquidity, which in turn means lower funding liquidity, and so forth.

Central-bank liquidity

Central-bank liquidity is the banks' demand deposits with the central bank and may be readily applied in settlement of payments. Central-bank liquidity is included in the banks' funding liquidity. The banks' demand for central-bank liquidity is associated with the fact that these claims on the central bank are accepted as risk free and can always be used to settle outstanding balances among banks and between banks and the central bank.

The banks' access to central-bank credit is essential to the availability of central-bank liquidity. Overall, the volume of central-bank liquidity available to the banks is limited to that provided by the central bank. The banks can trade central-bank liquidity among themselves, but they cannot create central-bank liquidity.

¹ See e.g. Nikolau (2009) for an overview of liquidity concepts, and Brunnermeier and Pedersen (2009) for a discussion of the relationship between funding and market liquidity.

Access to *longer-term loans* offers banks enhanced certainty as regards the liquidity situation over a longer period of time. This may be relevant when banks require longer-term funding, and when their

general access to funding liquidity is uncertain. In December 2011 and in light of the debt crisis, the European Central Bank, ECB, introduced a number of measures to support liquidity, including 3-year loans, cf. Box 3 in Current Economic and Monetary Trends in this Monetary Review. Demand for ECB 3-year loans has been significant, and one Danish bank with units in the euro area has declared that it has raised 3-year loans from the ECB. Analyses prepared by the ECB indicate that banks have primarily raised the loans for funding purposes, and that the loans have facilitated access to funding for the real economy amid the debt crisis, cf. ECB (2012). The banks may include 3-year loans in their funding and thus avoid a considerable and constant need for refinancing, as would otherwise have been the case with short-term monetary-policy loans. The 3-year loans may therefore underpin bank liquidity in the medium term.

A wide and extensive collateral basis with respect to central-bank lending facilitates bank funding in the event that market funding becomes less accessible.

In times of generally difficult funding conditions for the banks, *broad-based access to central-bank liquidity facilities* will mitigate uncertainty as regards funding liquidity. Furthermore, equal access for all banks irrespective of their financial position and systemic importance will alleviate further uncertainty as regards counterparty credit and liquidity conditions. Cecchetti and Disyatat (2010) analyse the options available to central banks to support liquidity in various situations. In times of a broad-based liquidity shortage, they recommend a general scheme available to all monetary counterparties.

The central banks' extraordinary measures reassure the banks of the availability of liquidity. The measures support loan-market activity because they reassure the lender that it will receive liquidity again. Moreover, the possibility of raising liquidity from the central bank strengthens borrowers' bargaining position in the money and capital markets. Thus, the central banks support the creation of liquidity by market players by signalling willingness to provide liquidity. In other words, the extraordinary measures introduced by the central banks may improve the banks' funding liquidity even when the banks do not actively make use of the measures.

Several of the central-bank measures are temporary and some have already been phased out. To support smoothly functioning markets it is important that banks operate on market terms in normal times. Traditionally, a market solution supports efficient liquidity management by banks and efficient pricing in the money and capital markets.

DANMARKS NATIONALBANK'S MONETARY-POLICY INSTRUMENTS AND MEASURES TO SUPPORT LIQUIDITY

Danmarks Nationalbank's accounts with the banks are managed via monetary-policy instruments, i.e. the lending and deposit facilities that Danmarks Nationalbank makes available to the monetary-policy counterparties, cf. Box 2.

Danish monetary-policy instruments are designed primarily to support the fixed-exchange-rate policy. This implies that changes in Danmarks Nationalbank's interest rates must be clearly reflected in short-term money-market rates, which determine the krone rate. Consequently, the instruments must also support a smoothly functioning money market in which liquidity in the financial system is distributed efficiently on market terms, and money-market rates reflect official interest rates. Moreover, the instruments must support a stable financial system, including a secure settlement of payments. This is enshrined in section 1 of the Danmarks Nationalbank Act, stating that Danmarks Nationalbank has the responsibility "...to maintain a safe and secure currency system in this country, and facilitate and regulate the traffic in money and the extension of credit".

MONETARY-POLICY COUNTERPARTIES AND COLLATERAL BASIS

Box 2

Danmarks Nationalbank's monetary-policy counterparties are banks and mortgage banks operating pursuant to the Danish Financial Business Act. In addition, Danmarks Nationalbank also gives Danish branches of foreign credit institutions with corresponding activities access to the monetary-policy instruments.

As a general rule, Danmarks Nationalbank offers monetary-policy counterparties access to credit in Danish kroner against collateral in the following securities:

- Securities issued by the Kingdom of Denmark
- Bonds guaranteed by the Kingdom of Denmark
- Bonds issued by KommuneKredit and Danish Ship Finance
- Mortgage bonds and covered bonds
- Senior debt in relation to covered bonds meeting a rating requirement
- Bonds issued by Føroya Landsstýri (the Faroese government)

The monetary-policy counterparties may pledge their own mortgage bonds and covered bonds as collateral, as these bonds will be given preferential treatment over the underlying collateral in the event of insolvency.

In addition, since October 2011 banks have, as a general measure, been allowed to pledge their own credit claims of good quality. Moreover, in August 2011 the collateral basis was temporarily expanded to include shares in the companies jointly owned by the banks (sector shares). Furthermore, government-guaranteed issuance by banks and mortgage banks and SPV bonds issued on the basis of such issuance may be temporarily pledged to Danmarks Nationalbank.

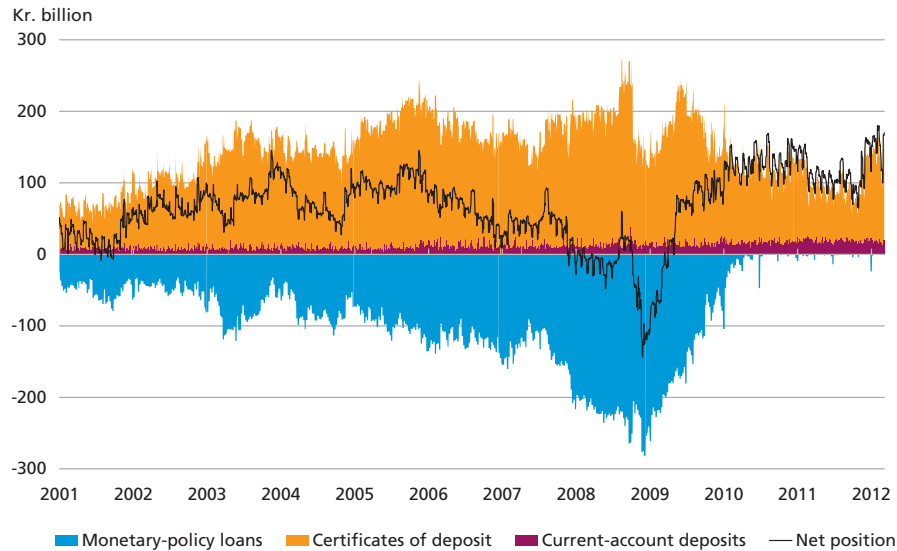
Danmarks Nationalbank's provision of central-bank liquidity

Danmarks Nationalbank's most recent measures have targeted the banks' access to funding. Danish monetary policy normally focuses on liquidity in the form of demand deposits at the current accounts held with Danmarks Nationalbank by the monetary-policy counterparties, i.e. central-bank liquidity or current-account liquidity. Current-account liquidity may be readily applied towards the settlement of interbank payments and payments to the central bank. By providing current-account liquidity, Danmarks Nationalbank ensures adequate liquidity in the financial system for smooth and secure settlement of payments. To restrict the amount of funds otherwise available for speculation against the krone, a limit has been imposed on the total current-account deposits held by the counterparties.

Danmarks Nationalbank provides liquidity to the financial system via weekly regular open market operations. Liquidity is allotted via lending against collateral, and liquidity is absorbed by selling certificates of deposit. To the necessary extent, Danmarks Nationalbank will conduct extraordinary open market operations to manage liquidity by purchasing and selling certificates of deposit. This gives the counterparties an opportunity to obtain liquidity by selling certificates of deposit through Danmarks Nationalbank's open market operations, and they exchange liquidity in the money market. Furthermore, the counterparties may

BORROWING AND DEPOSITS BY BANKS AND MORTGAGE BANKS AT DANMARKS NATIONALBANK

Chart 1



Note: The net position is the sum of certificates of deposit and current-account deposits less monetary-policy loans.
 Source: Danmarks Nationalbank.

trade certificates of deposit among themselves and use them as collateral at Danmarks Nationalbank. Danmarks Nationalbank's monetary-policy instruments give the banks a high degree of flexibility in terms of obtaining collateralised liquidity. All monetary-policy counterparties have access to the open market operations and can freely decide the volume of monetary-policy loans at the lending rate determined by Danmarks Nationalbank.

Today, the monetary-policy counterparties' overall have a liquidity surplus vis-à-vis Danmarks Nationalbank and thus a need for placement of liquidity with Danmarks Nationalbank. They only occasionally and to a very limited extent raise loans at Danmarks Nationalbank, cf. Chart 1. During the financial crisis, the counterparties increased their loans from as well as deposits with Danmarks Nationalbank until end-2008. The majority of deposits were in the form of certificates of deposit. As mentioned above, these may be converted into current-account liquidity in the open market operations, constituting a liquidity reserve for the counterparties, cf. Dam and Risbjerg (2009) and Jensen et al. (2010).

Danmarks Nationalbank's measures to support liquidity

In order to safeguard financial stability, Danmarks Nationalbank has since 2008 taken various steps to support bank liquidity. Most recently, two separate measures have been introduced.

Firstly, the collateral basis has been expanded to include the banks' own credit claims of good quality. Furthermore, the banks can temporarily borrow against shares in the companies that they own jointly. The expanded collateral basis may be used for all types of loans with Danmarks Nationalbank and ranks equally with the remaining collateral basis without quantitative restrictions or interest premia. At the time of the announcement of the scheme, the collateral value of the banks' own credit claims was estimated at kr. 400 billion. The actual value will be lower, partly because some of the credit claims have been pledged to other creditors or are subject to contractual terms preventing them from being pledged to Danmarks Nationalbank. Moreover, the collateral value should be adjusted for the debtor's full entitlement to offset claims. Whereas some banks may find it attractive to pledge credit claims to Danmarks Nationalbank, others may find that having the option is enough. The option to borrow *per se* makes it easier for the banks to obtain refinancing on market terms as it reduces the risk of liquidity problems.

Secondly, Danmarks Nationalbank has introduced a temporary 3-year credit facility, which will be offered on 30 March and 28 September 2012. Danmarks Nationalbank uses an open window, in line with its other lending. This means that banks and mortgage banks can freely de-

side the volume of loans. Loans may be secured by Danmarks Nationalbank's entire collateral basis. The rate of interest is variable and follows Danmarks Nationalbank's 7-day monetary-policy lending rate plus an interest premium. Until 31 July 2013 the interest premium is zero, and the rate of interest therefore equals the 7-day rate. If, after that time, Danmarks Nationalbank finds that access to funding in the money and capital market has normalised, the interest premium will be increased. Loans may be prematurely redeemed in part or in full on a weekly basis, at the earliest six months after being raised.

Furthermore, in October 2011 Danmarks Nationalbank introduced a 6-month facility. Monetary-policy counterparties may raise collateralised 6-month loans at a variable rate of interest equal to Danmarks Nationalbank's lending rate in the weekly open market operations. The facility is open on the last Friday of every month. So far, only kr. 0.1 billion has been drawn on the facility; on the last Friday of February 2012.

THE BANKS' LIQUIDITY

The banks' liquidity may be described on the basis of their balance sheets, where assets may be broken down according to market liquidity and liabilities according to maturity, cf. Chart 2.¹ The banks' liquidity management is described in more detail in Rasmussen (2010).

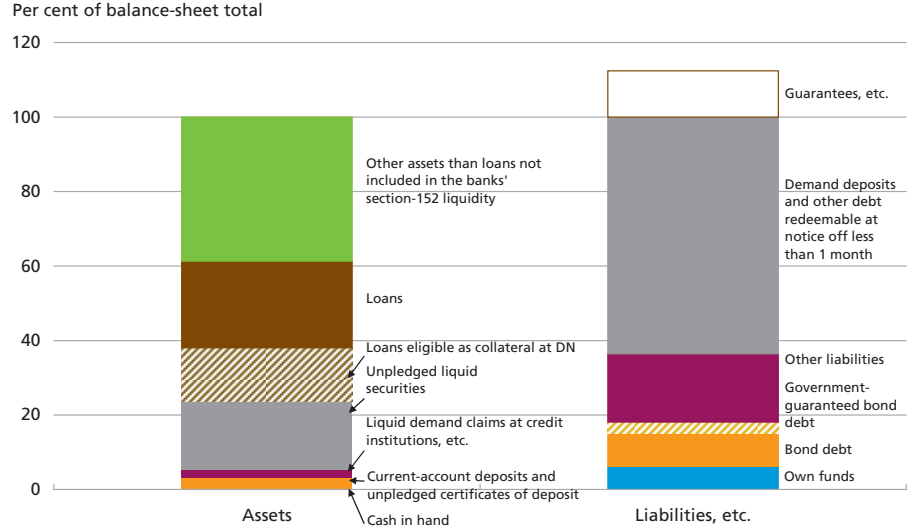
The more liquid the assets, the easier it is to raise liquidity by selling them. Another option to raise liquidity via assets is by pledging them as collateral for loans. Close to 25 per cent of the banks' total assets are sufficiently liquid to allow the banks to include them in the calculation of their statutory liquidity, otherwise referred to as section-152 liquidity in the Danish Financial Business Act. The balance-sheet composition of individual banks varies considerably, however. Current-account deposits with Danmarks Nationalbank and unpledged certificates of deposit account for about 13 per cent of the banks' section-152 liquidity. The option to pledge credit claims of good quality to Danmarks Nationalbank is similar to a buffer of liquid assets. Thus, it is only natural that, within certain limits determined by the Danish Financial Supervisory Authority, the banks may include access to loans at Danmarks Nationalbank when calculating their statutory liquidity, cf. Box 3.

The longer the maturity of the liabilities, the less the need for raising liquidity on an ongoing basis to refinance them. Basically, the contractual term to maturity of the banks' liabilities is short, as the majority com-

¹ In the following, banks include the Danish Financial Supervisory Authority's groups 1-3 including foreign branches. Banks transferred to the Financial Stability Company are not included.

BANKS' BALANCE-SHEET STRUCTURE END-2011

Chart 2



Note: Stated at end-December 2011. Loans that may be pledged to Danmarks Nationalbank are estimated at the time of the introduction of the scheme. The Danish Financial Supervisory Authority's guideline limits are not included. The chart includes the Danish Financial Supervisory Authority's groups 1-3 including foreign branches. Banks transferred to the Financial Stability Company are not included.

Source: Liquidity reports from the banks to the Danish Financial Supervisory Authority and Danmarks Nationalbank as well as own calculations.

prises demand deposits and other debt with a period of notice shorter than one month. Requirements for bank liquidity take into account the term to maturity of the liabilities, cf. Box 3.

The banks' loans at Danmarks Nationalbank are also included on the liabilities side of their balance sheets. By end-2011, however, the banks had almost no loans with Danmarks Nationalbank, cf. Chart 2.

Given the current market conditions, the possibility that small and medium-sized banks in particular will be able to obtain new funding liquidity by issuing bonds is slim, cf. Danmarks Nationalbank (2012). In the coming years, the banks face major bond redemptions, a large part of which were issued with individual government guarantees. Issued bonds without government guarantees account for close to 10 per cent of the banks' total assets, whereas bonds with government guarantees account for approximately 3 per cent, cf. Chart 2. For some banks, however, the ratio is significantly higher.

Danmarks Nationalbank's 3-year loans offer the banks an opportunity to obtain long-term funding, even if this is not possible in the market. The banks can thus include the 3-year loans in their funding plans, using the loans as a transition to a situation without government-guaranteed bonds, when the latter mature in 2012 and 2013. In addition, the 3-year

SECTION-152 LIQUIDITY REQUIREMENTS AND FUNDING RATIO

Box 3

Pursuant to section 152 of the Danish Financial Business Act, a bank shall have appropriate liquidity comprising cash in hand, current-account deposits and unpledged demand deposits, fully secured and liquid demand deposits with credit institutions and insurance companies, etc. and liquid securities not used as collateral for a loan. In addition, the credit facility based on loans that can be pledged to Danmarks Nationalbank may be included within certain limits. The bank's portfolio of liquid assets must at least constitute the higher of:

- 15 per cent of the debt exposures that, irrespective of possible payment conditions, shall be payable by the bank on demand or are redeemable at less than 1 month's notice, or
- 10 per cent of the total debt and guarantee exposures of the bank, less subordinated debt that may be included in calculations of the capital base.

The liquidity requirement is supplemented with the supervisory diamond, which was introduced by the Danish Financial Supervisory Authority in 2010. The supervisory diamond defines a benchmark for excess liquidity coverage of at least 50 per cent of the minimum requirement.

The supervisory diamond also introduces a measure for stable funding, known as the funding ratio. The aim is for banks to achieve a funding structure comprising funding sources with longer maturities.

The funding ratio reflects the relation of lending on the one hand and working capital less bonds maturing in less than 1 year on the other,

$$\frac{\textit{Lending}}{\textit{Working capital - bonds maturing in less than 1 year}} < 1$$

where working capital comprises deposits, issued bonds, subordinate loan capital and equity capital. As from 1 January 2012, banks may also include loans raised at Danmarks Nationalbank with a remaining term to maturity of more than 1 year.

With effect from end-2012, non-observance of the limit values of the supervisory diamond may result in a supervisory response. For example, the Danish Financial Supervisory Authority may give the bank risk information (i.e. draw the bank's attention to special risks in connection with its operations), which is to be published. A supervisory response will, however, always be based on a specific, individual assessment and does not automatically go hand in hand with non-observance of the limit values.

loans may be included in the banks' funding without creating a substantial, ongoing need for refinancing, which would otherwise have been the case with short-term monetary-policy loans. Furthermore, the banks can include the 3-year loans in the Danish Financial Supervisory Authority's funding ratio, cf. Box 3.

Incentive for efficient liquidity management

While it is a core central-bank task to ensure a sufficient liquidity supply in times of crisis, it is also decisive that the banks remain highly resilient

to liquidity shocks. Internationally, steps are being taken to establish new liquidity requirements that will, in time, improve bank resilience to liquidity shocks. A new requirement in the form of a Liquidity Coverage Ratio, LCR, is expected to be implemented in 2015. The new requirement will ensure that banks operate with adequate high-quality liquidity buffers to resist short-term liquidity shocks. A stable funding requirement, Net Stable Funding Ratio, NFSR, is also on the drawing board. Furthermore, with the introduction of the supervisory diamond applicable from end-2012, the Danish Financial Supervisory Authority has defined national guiding points for bank liquidity management, which will in future improve their resilience to liquidity shocks, cf. Box 3.

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