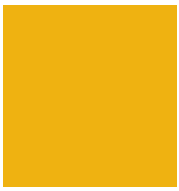
Sveriges Riksbank Economic Review

2011:1

SVERIGES RIKSBANK



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PUBLISHER: CLAES BERG

EDITORS: CLAES BERG, KERSTIN MITLID
AND THE COMMUNICATIONS SECRETARIAT
Sveriges Riksbank, 103 37 Stockholm, Sweden.
Telephone +46 8 787 00 00

Advisory editorial committee: Joanna Gerwin, Martin W Johansson,
Göran Robertsson, Kasper Roszbach and Ulf Söderström.

Graphic design: Eva Stenström

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Dear reader,

You see before you the first issue of the journal Economic Review for the year 2011. This is the first issue to be published solely on the Riksbank's website. This has allowed us to streamline the production process and to introduce a few new technical solutions that will make the journal easier to read. Among other improvements, charts and figures can be presented in more colours.

The aim of the journal, however, remains the same. In this journal, we publish in-depth analyses of monetary policy, financial stability, the management of the foreign currency reserve and international cooperation on economic issues and central banks' activities. Articles are to contribute towards the dissemination of new knowledge in the clearest and most educational manner possible. They may be written either by the Riksbank's own staff or by external experts.

In this issue, you will find three articles focusing on issues important to the analysis of monetary policy and financial stability.

- Daria Finocchiaro, Dan Nyberg, Christian Nilsson and Albina Soultanaeva discuss how Swedish households' increased indebtedness can be interpreted through a study of the academic literature on household indebtedness, housing prices and the macroeconomy.
- Benny Carlsson describes how, in 1931, Sveriges Riksbank became the first central bank in the world to introduce a target for the stabilisation of the domestic price level, and how the discussion of this pioneering achievement was presented in Sweden's daily press in the 1930s.
- Johanna Eklund and Per Åsberg Sommar describe the Swedish market for balancing liquidity between the banks and analyse how it has been affected by the financial crisis.

If you have any views or comments on the journal, please contact us at the email address pov@riksbank.se

Enjoy!
Claes Berg and Kerstin Mitlid
Editors

Contents

This article uses transaction data from the Riksbank's payment system RIX to study the functionality of the overnight market and to determine whether monetary policy is being implemented efficiently. The study shows that, both before and during the crisis, the overnight rate for the banks varied within the band deemed by the Riksbank to represent efficiently implemented monetary policy. At the same time, the result shows that the deviation of the overnight rate from the repo rate and the level of volatility in the overnight rate have both increased since the outbreak of the financial crisis. In addition, the study shows that the level of activity on the overnight market was low during the financial crisis. The level of activity did not increase until October 2010, when the Riksbank's last fixed-interest rate loan with a one-year maturity fell due. However, the banks' liquidity planning seems to have changed slightly after the crisis. For example, banks that previously systematically financed large deficits on the overnight market have done this to a significantly lesser degree since October 2010.

Household indebtedness, house prices and the macroeconomy: a review of the literature

Daria Finocchiaro, Christian Nilsson, Dan Nyberg and Albina Soultanaeva*

In the last 15 years, household indebtedness has increased substantially in Sweden. Since the mid-90s, debt-to-income ratios have nearly doubled. Since mortgages represent about 80% of household debt, the substantial increase in indebtedness, coupled with a rally in house prices, has raised concerns about the possibility of an unsustainable credit growth. In light of these developments, this article reviews the existing economic literature on the potential explanations for, as well as the macroeconomic consequences of, the observed substantial increase in the households' leverage. Given the strong connection between real estate markets and the households' borrowing choices, the article also discusses the driving forces behind house price developments. We conclude by discussing to what extent the results of international research on this topic can be used to shed light on the current situation in Sweden.

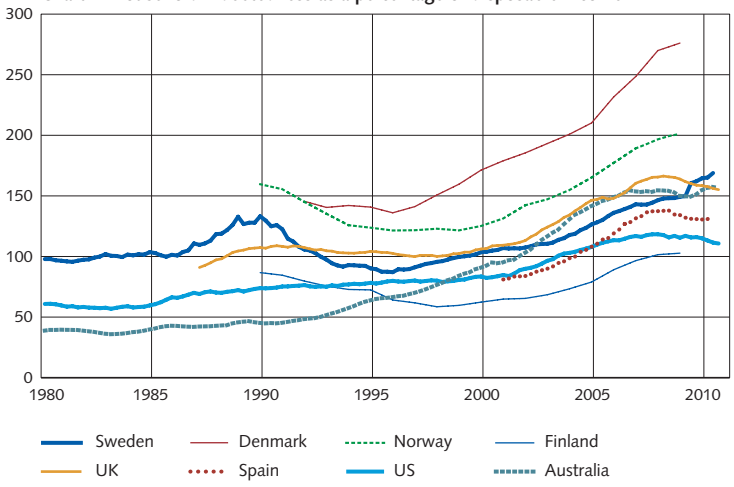
Introduction

Over the past 15 years, credit growth in Sweden has vastly exceeded the growth in the households' disposable income. As a result, Swedish households' indebtedness has increased substantially. Following the sharp decline in household debt after the banking crisis in 1992-1993, household indebtedness increased from 90% of disposable income in the mid-1990s to around 170% in 2010, see Chart 1. Other countries have experienced similar trends in the household debt-to-income ratio, some of which are shown in Chart 1.[1]

* Daria Finocchiaro works in the Riksbank's Research Division. Christian Nilsson and Dan Nyberg work in the Riksbank's Monetary Policy Department. Albina Soultanaeva works in the Riksbank's Financial Stability Department.

1 The household debt/GDP ratio shows a similar pattern in Sweden (see Hansson, 2010).

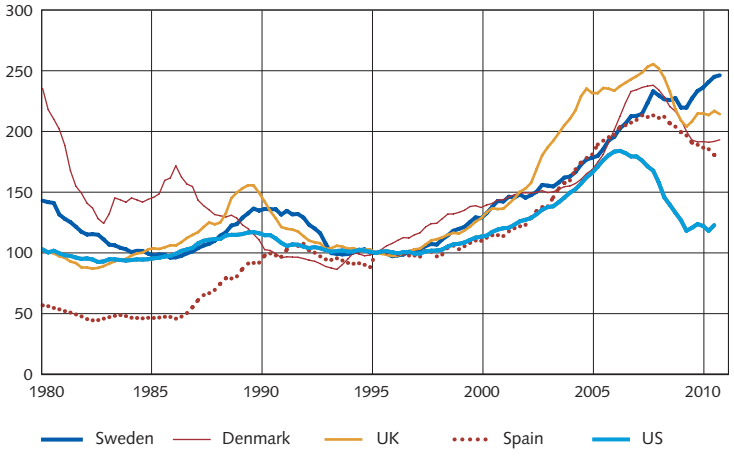
Chart 1. Household indebtedness as a percentage of disposable income



Sources: The BIS, national central banks, Reuters EcoWin and the Riksbank.

Housing credit growth is the main factor in rising household indebtedness. For most households, real estate makes up the bulk of their assets, while mortgages constitute the largest liability. House prices have been increasing in Sweden since the mid-90s. At the onset of the financial crisis, real house prices in Sweden stopped rising and even fell by about 5% in 2008-2009. Since then, real house prices in Sweden have started to increase again. Chart 2 shows the development of house prices in Sweden and some other countries.

Chart 2. Real house prices
Index 1995 Q1=100



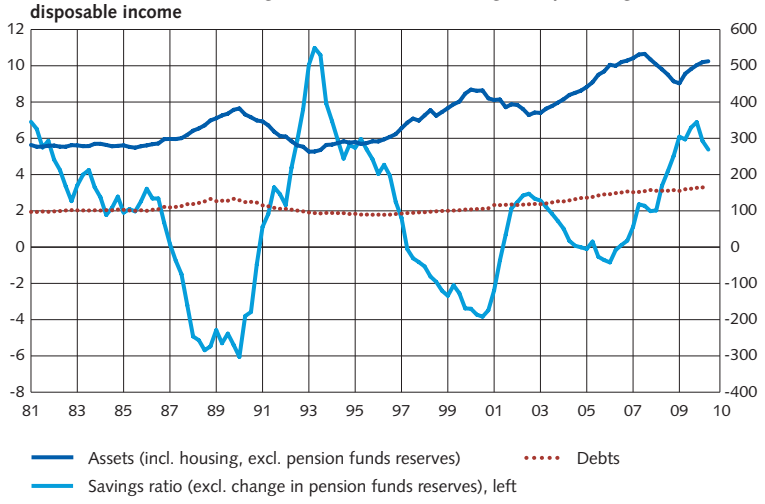
Note. Data for the US until 2010 Q2

Sources: Reuters Ecowin and Statistics Sweden.

The recent prolonged increase in house prices in Sweden and in many other advanced countries has boosted the asset side of the households' balance sheets, and in many

cases, households' net wealth has increased. Chart 3 shows the development of Swedish household debt, assets and savings. In the mid-1990s, the Swedish households held assets worth about three times their debt. In 2000, this ratio had increased to four, but 10 years later it is now back to three again.

Chart 3. Swedish household gross debt, assets and savings as a percentage of disposable income



Sources: Statistics Sweden and the Riksbank.

Although house prices in Sweden have continued to rise, they declined in several industrialized countries in the wake of the 2008-2009 financial crisis (Chart 2), illustrating that the asset side of the households' balance sheets can be substantially affected by fluctuations in house prices and interest rates.

Prior to financial deregulation in the mid-1980s, Swedish household debt was relatively stable at 100 per cent of disposable income. Following deregulation, household debt increased rapidly to around 140 per cent before declining during the 1992-1993 financial crisis. Since that crisis, household debt has again trended up. This raises the question of what constitutes a sustainable level of household debt.

A wave of recent theoretical and empirical research has focused on illustrating the basic mechanisms of household indebtedness against the backdrop of falling house prices in many countries. In this context, this article reviews:

- How do fundamental factors like expected income, interest rates, preferences and demographics affect household saving behaviour?
- What is the importance of credit market frictions and financial innovations in explaining the evolution of household debt?
- What is the interaction between household indebtedness and the development of house prices?

- To what extent can the rapid rise in household indebtedness be explained by an increase in credit supply?
- What data would be useful to analyse these issues? Aggregate data might obscure risks that stem from the fact that households differ in resources, constraints and preferences.
- What factors are relevant when evaluating the indebtedness of the Swedish households and possible risks to financial and macroeconomic stability? What policy conclusions can we draw for Sweden?

What is driving household debt? Some theory

The permanent income/life-cycle model is a useful starting point for considering household debt from an economic theory point of view.[2] Households save or borrow based on their expected lifetime resources, real interest rates and demographic factors. In this setting, with well-functioning financial markets, households aim to smooth out consumption even though incomes from wages and assets vary over the life cycle. This standard theory identifies a number of variables that influence the households' choice of consumption and level of borrowing:

- **Real interest rates.** Changes in real interest rates affect consumption through different channels with opposite signs. On the one hand, a decline in the real interest rate can boost borrowing because it cuts the cost of servicing the debt and decrease savings because it increases the present discounted value of future income. On the other hand, a lower return on savings also implies lower consumption in the future given the present value of lifetime resources. This last effect can boost savings. So the net effect of real interest rates on consumption and savings is ambiguous.
- **Future income**. An increase in future income expectations drives consumption up, boosting borrowing.
- **Demographics.** Individual income profiles vary substantially with age. Shifts in the age composition of the population can help explain changes in household debt.
- **Uncertainty.** The households' attitude towards risk (for example income uncertainty and time-varying interest rates) is also an important factor in the life-cycle consumption and borrowing decisions. With uncertainty, households choose to build up precautionary savings/wealth. If uncertainty is reduced, the households' rational response is to reduce precautionary saving.

With this framework in mind, historically low real and nominal interest rates, a substantial decrease in macroeconomic volatility, changes in taxation, or the ageing of the baby boom

2 See Ando and Modigliani (1963) and Friedman (1957). See also Debelle (2004) for a survey of household borrowing in the life-cycle framework and macroeconomic implications.

generation,[3] have all been pointed out as potential factors behind the observed increase in indebtedness.

In this standard model, borrowing is the result of households' optimal responses to economic conditions. However, recent research has considered partial departures from this simplified paradigm to explain why households do not necessarily reach their efficient consumption or borrowing levels. Imperfections in credit markets or irrational behaviour on the part of borrowers (and/or lenders) are just some examples of the numerous factors cited in the literature to potentially explain household over-indebtedness. Below we discuss the most important factors and describe how these alter the conclusions one would draw from the standard life-cycle/permanent income model.

Financial market imperfections and borrowing decisions

Financial markets are not perfect. The simple model sketched above abstracts from credit market imperfections, an important determinant in households' borrowing decisions. Liquidity-constrained households borrow *less* than they would optimally choose to do. As a result, financial deregulation and the potentially implied easier access to credit markets can boost borrowing among those households who initially were financially constrained. This last channel works not only for households who were excluded from financial markets, but also for those households who were borrowing less than they would have liked to because of binding borrowing constraints. In this sense, in a life-cycle/permanent income model augmented with a borrowing constraint, relaxing this constraint allows households to better smooth out their consumption and enhances welfare. Against this background, aggregate household debt would rise as previously constrained households reach their new optimal borrowing level.

Financial frictions and over-borrowing. Imperfections in credit markets can also induce *excessive* borrowing (see for example, Lorenzoni, 2008, and Bianchi and Mendoza, 2011). Financial constraints are usually tied to collateral values and can amplify the effects of a downturn on the economy via their feedback effects on asset prices. When making borrowing decisions, private agents might not take into account that, during a slump, fire-sales of assets will further reduce asset prices. This will shrink their ability to borrow and exacerbate the recession. As a result, they will over-borrow during a boom and their behaviour will increase macroeconomic volatility. In this environment, by taking into consideration this amplification mechanism, the government can reduce aggregate borrowing in a boom and dampen asset sales in a slump. This channel provides a justification for a macroprudential approach in financial supervision. This mechanism and the resulting interaction between asset prices and financial distress could have been at work in the recent financial crisis.

3 Dynan and Kohn (2007) explore the effects of the ageing of the baby boom generation on the evolution of US household debt since 1983.

Behavioural approaches: irrationality and over-indebtedness

Behavioural factors can also generate excessive borrowing. "Self-control" problems, "overconfidence" or a lack of "financial literacy" are some of the examples cited in the literature. All these factors can potentially generate unrealistic expectations about asset prices that can further increase borrowing above rational or optimal levels and create vicious circles.

Self-control problems. In economics, a self-control problem describes a situation where there is a conflict between short-term and long-term preferences. Households who think they should save more for retirement, but still prefer not to cut their consumption today, suffer from self-control problems. Clearly, such behaviour could importantly influence saving choices and lead to under-saving (or excess borrowing).[4]

Financial literacy, overconfidence and financial mistakes. Households might take on more debt than is rationally appropriate because they lack the knowledge required to make the right investment decisions, so-called "financial literacy". Agents may also hold insufficient precautionary savings or too much debt because they are overconfident and underestimate the variance of future shocks.[5] In this context, households could interpret historically low real interest rates as reflecting a permanent change in real interest rates and base their borrowing decisions on this misperception. This channel can be further strengthened if banks also change their risk attitude, for example in extended periods of low interest rates, and soften their lending standards for new loans.[6] In theory, such a permanent change in real interest rates would be justified by a permanent decrease in growth rates, in discount factors, that is household preferences, or a permanent cut in capital income tax rates.[7] Over time, financial markets have evolved and new, more complex, financial products have been created requiring a higher level of sophistication among investors. At the same time, economic policies that indirectly stimulate homeownership, such as interest rate deductions, or that increase the degree of individual responsibility in managing pension savings have been implemented.[8] Thus, individual financial decisions have become more relevant at a macroeconomic level. If household over-borrowing is the result of poor financial literacy, policies such us financial education and saving programmes could be a tailor-made solution to the problem.

Credit frictions and behavioural factors. A combination of credit frictions and behavioural factors can explain excessive borrowing and credit-induced asset price fluctuations. Most of the literature on credit market inefficiencies takes leverage[9] as a given variable and focuses on the equilibrium determination of interest rates. In Geanakoplos's

4 See Laibson (1997) and Angeletos et al. (2001).
5 See Kahneman, Slovic and Tversky (1982).
6 Ioannidou et al. (2007) find evidence of a link between short-term interest rates and banks' risk taking.
7 See Jonsson (2002).
8 In the United States, the shift from defined benefit to defined contribution pension plans has increased individuals' discretion in choosing how to allocate their retirement savings. The reform of the Swedish pension system approved in 1998 goes in the same direction. In the actual system, a share of individual contributions is deposited in capital funds chosen by the pension-saver.
9 More specifically, leverage is defined as the ratio between the asset value and the equity used to purchase it.

(2010) theory of "leverage cycles", the interaction between "natural buyers", that is people who value an asset more or have more optimistic beliefs, and "natural sellers" determines both asset prices and leverage in equilibrium. Natural buyers are willing to pay more and, most importantly, be more leveraged to be able to hold the asset.[10] If, following bad news for the asset, they lose their ability to borrow then they will invest less in the asset. As a consequence, natural sellers will now hold the asset. Asset prices and leverage will go down and the initial bad shock to asset prices is amplified. This simple mechanism will create a "leverage cycle": leverage will be too high in booms and too low in bad times. Geanakoplos (2010b) argues that behind the recent financial crisis in the United States there are two leverage cycles reinforcing each other: in financial and in housing markets. According to his theory, the upsurge in house prices observed in the United States just before the crisis relied mainly on a credit expansion. New, more leveraged, households entered into housing markets, thus pushing up housing prices even further. Slowly, lenders started to become more alert and house prices sharply declined following the increase in the delinquency rate. The massive fall in house prices induced by the crisis has made it more difficult for households to get new loans and to refinance old loans. This has created problems for these loans as well as for the securities they back, that is new securitizations have also become more difficult to underwrite. The author's main conclusion is that central banks should actively monitor leverage levels in the economy.

Housing and household debt

Housing plays a key role in household indebtedness. Specifically, it is important to take into account housing-finance motives to understand household borrowing behaviour. Real estate serves two important functions: houses are investment assets but also durable goods that provide direct services for households. At a certain point in their lives, all households will need to face important decisions on whether to rent or buy, or on which kind of mortgage to subscribe. As a result, a major share of the households' wealth is held in this form and this makes the whole economy vulnerable to house price movements. Importantly, housing can also be used as collateral and variations in house prices can facilitate or impede access to credit markets. This last mechanism is emphasized in Ortalo-Magne and Rady (2006), where the "capital gains channel", that is the ability to move up the housing ladder when house prices are increasing, is a determinant of housing and borrowing demand for credit constrained homeowners. This can further boost house prices since more households will be able to afford more expensive homes using their capital gains.[11] Higher house prices may also require a larger amount to be borrowed.[12] In addition,

10 A "natural buyer" is someone who is willing to pay more than the rest of the public for a specific asset. This can reflect a higher risk tolerance, different, more optimistic beliefs or simply the fact that she/he values the asset more. Furthermore, some investors may be more expert than others at evaluating an asset because they possess more information.

11 Collateral constraints on housing play a crucial role also in Iacoviello (2005) where house price booms can amplify business cycle fluctuations by relaxing household collateral constraints.

12 In the literature, this is called the"front loading effect". The strength of this mechanism of course depends on an individual's asset position.

tax incentives, such as mortgage interest cost deductibility, could also boost borrowing via an induced portfolio rebalancing, that is encouraging households to invest more in housing.

Wealth effects of increasing house prices? An increase in house prices could boost consumption and reduce savings via a housing wealth effect. This channel holds for households who are planning to downsize in the future. It works in the opposite direction for households planning to buy a bigger house. In a representative agent model these two effects cancel out, that is on average there are no housing wealth effects (see Buiter, 2010). In reality, the aggregate outcome of housing wealth effects depends on the demographic structure of society. Moreover, housing wealth may affect spending indirectly, via its effect on consumers' access to credit.[13]

Renting versus owning real estate. Most of the housing literature focuses on the riskiness of housing investment. Renting, however, is also a risky activity since rents are subject to fluctuations. Sinai and Souleles (2005) explicitly take into account the fact that when deciding whether to buy a house or not, households trade off these two risky activities. The rent risk is particularly high for households that expect to stay in their houses for an extended period of time. A greater spatial correlation in house prices across different markets and a high persistency in house prices over time are both factors that reduce house price risk, that is both factors are likely to close the gap between sale and purchase prices when a household moves. According to Sinai and Souleles, the demand for homeownership should reflect the trade-off between rent and house price risk, a prediction that is consistent with U.S. data. Most importantly, they show that expected future rents and rent variance have an important effect on house prices. Clearly, a high degree of regulation in the rental market will alter this trade-off. If renting is not a real option, households will be forced to make risky housing investments even if their expected length of stay in their house is short. Therefore, rental regulation will expose households to more house price risk.

Bubbles in housing markets. Bubbles in housing markets arise when the observed price deviates from some notion of fundamental value.[14] Many researchers have stressed the observed high volatility in house prices and have suggested that housing markets seem intrinsically prone to bubbles. An increase in household debt fuelled by investors' naively optimistic expectations regarding house prices could potentially constitute a serious threat to financial stability. Akerlof and Shiller (2008) argue that unmotivated confidence in housing investments, "money illusion" and more generally what they label as "animal spirits" historically have all been significant factors behind housing cycles.[15] Households that do not understand the difference between nominal or real quantities suffer from "money illusion". Disagreement about real interest rates between smart and illusionary investors can stimulate borrowing and lending and drive up the price of collateral (see Piazzesi and Schneider, 2007). This channel works during periods of both high and low inflation. In a low inflation environment, illusionary investors will confuse low nominal rates

13 This last effect is not considered in Buiter (2010), since he abstracts from borrowing constraints.
14 See Dillén and Sellin (2003) for a review of the literature on financial price bubbles.
15 See Allen and Rogoff (2011) for a review of the literature on real estate bubbles that arise from asymmetric information and agency problems.

with low real rates and invest more in housing. During times of high inflation, they will be replaced in housing markets by smart investors. Smart investors correctly understand that real rates are low and want to invest in housing. Thus, the model can potentially account for the housing boom in the high-inflation 1970s as well as in the low-inflation 2000s observed in many countries.

Why has household debt increased? Empirical results

A number of empirical studies have tried to explain the observed increase in household indebtedness and disentangle the contribution of the different potential explanatory factors identified in the theoretical literature. This has proven to be a difficult task as it is not always possible to discern between causality and mere correlation. In addition, some of the potential factors behind indebtedness, such as credit, are not easily measurable or have evolved only gradually over time, such as financial innovation. Moreover, trying to explain household indebtedness by looking at aggregate data can be misleading. In this respect, it is useful to look at household level data and analyse their portfolio composition to assess the risks connected to high indebtedness. A disaggregated analysis of house-price data, both at a regional or even at a neighbourhood level, could also be fruitful. For example, an inspection of Swedish regional data reveals that the sizable upsurge in house prices is mainly a big-city phenomenon (see Englund, 2011). The sharp increase in property prices in low-income neighbourhoods observed just before the subprime crisis in the United States has been interpreted by many commentators as the result of lax credit standards. A similar analysis would also be relevant for Sweden.

Can we explain increasing household debt using "traditional channels"?

There are several papers that use traditional channels, such us interest rates, future income or demography, to explain the rise in household debt. Barnes and Young (2005) use a simple calibrated model in which housing is both a consumption good and an investment good to show that changes in interest rates, future income growth and demographic effects can explain the rise in the debts of the US households during the 1990s. However, these factors cannot account for rising indebtedness during the 1980s, a period characterized by high interest rates and lower income growth. Finocchiaro and Queijo von Heideken (2007) use a similar approach on Swedish data. They find that a combination of low real interest rates and less strict LTV (loan-to-value) requirements can account for most of the increase in Swedish household debt since the 1990s. These studies do not consider the effect of house prices on indebtedness. Dynan and Kohn (2007) explain the rise in US household indebtedness since the early 1980s by analysing the following factors:

- **Household preferences.** There is only limited evidence of a decrease in patience or increase in risk appetite among responders of the Survey of Consumer Finances (SCF) between 1983 and 2004.

- **Interest rates.** According to the econometric models used by the Federal Reserve Board, low interest rates had a very limited effect on the saving rate between 1990 and 2000.
- **Demographic shifts.** The shift of the baby-boom generation, from the youngest to the middle age group, has partially boosted aggregate debt. However, according to their data, increasing debt is an increasing trend among all age groups, hinting at the contributions of other explanatory factors.
- **House prices and financial innovation.** Dynan and Kohn estimate that rising house prices can justify one fifth of the total increase in household debt. Their study also reports some suggestive evidence on the importance of financial innovation for the uptrend in debt. On the one hand, they downplay the role of the "democratization of credit," that is easier access to credit markets for previously constrained households, as this would explain only one seventh of the observed increase in household debt between 1983 and 2004. On the other hand, they stress the importance of mortgage securitization on interest rates and the interplay between house prices and financial innovations as being particularly important from a quantitative point of view.

Dynan and Kohn's main conclusion is that changes in interest rates, income growth or in preferences can only partially explain the run-up of debt, while rising house prices and financial innovation were crucial.

The role of financial deregulation

Financial innovation has increased access to credit. The last thirty years have been characterized by considerable changes in financial markets. Gradually, banks have started granting housing loans with more generous loan-to-value ratios and longer amortization periods than in the past. Changes in the capital requirement introduced by Basel II and an increase in competition have further squeezed the margins on mortgage institution lending rates.[16] Last but not least, the development of secondary markets for mortgages and the emergence of mortgage-backed securities have also played an important role and drastically changed credit markets.

Credit rationing has been reduced. The effects of financial deregulation on household debt have been widely explored in the empirical literature. Gerardi et al. (2010) provide evidence that the deregulation of the mortgage market in the United States in the early 1980s was followed by an increase in borrowing among households with higher expected future incomes. Thus, their analysis suggests that financial deregulation has improved market efficiency. On the other hand, Mian and Sufi (2009) argue that the substantial mortgage credit expansion observed between 2002 and 2005 in subprime neighbourhoods in the United States can mainly be explained by an upsurge in credit supply. They also show

16 Capital requirements were calculated on the basis of risk weighted assets, which implied lower risk weights for collateralized lending.

that such an increase is not motivated by improvements in the creditworthiness of subprime borrowers, while it is correlated with an expansion in the rate of securitization. Interestingly, those subprime neighbourhoods have also experienced the highest number of defaults during the crisis.

Financial literacy — Do households make investment mistakes?

Household financial literacy is lagging behind. Another branch of the literature has focused on testing the ability of households to make the right financial decisions. The empirical results in Brunnermeier and Julliard (2006) support the idea that when people decide whether to buy or rent an apartment they confuse real and nominal rates, that is they suffer from money illusion. Their mistakes make them underestimate the real cost of future mortgage payments and cause an increase in house prices when inflation is low. Using US data, Lusardi and Tufano (2009) find that a lack of debt literacy, that is the ability to make simple decisions regarding debt contracts, is widespread and correlated to over-indebtedness. In their sample, individuals with lower debt literacy tend to judge their level of indebtedness as excessive. Gerardi et al. (2010b) attribute part of the massive defaults and foreclosures observed in the US mortgage market to limited financial literacy among borrowers. Their results suggest that financial mistakes can have considerable macroeconomic consequences. Based on a representative survey of 1,300 Swedish adults, Almenberg and Widmark (2011) find that both basic and advanced financial literacy substantially vary across different demographic groups and that they are an important determinant behind stock market participation or homeownership choices. In their sample, the oldest (age > 65) and youngest (age 18-29) respondents show a particularly low level of financial literacy. Among those individuals with a low level of financial literacy, one out of seven do not know what share of their mortgages are at an adjustable rate. Reassuringly, individuals with adjustable-rate mortgages also have a higher level of financial literacy. Their main policy conclusion is that many Swedish adults are not well equipped to make complex financial decisions.

The links between house prices, consumption and household debt

Housing wealth effects remain uncertain. There are contrasting results regarding the influence of house prices on household debt and the strength of the so-called "housing wealth effect". Mian and Sufi (2010a) show that, between 2002 and 2006, US homeowners responded to the upsurge in house prices by increasing their debt. More specifically, they find that the average household in their sample would increase its borrowing by 25 cents for every dollar gain in home equity. The extracted cash would then be used primarily for consumption or home improvement.[17] A recent survey study by Chakrabarti et al. (2011) reports that in 2006, on average, US homeowners increased their

17 Since the illustrated link between house prices and consumption implies the existence of credit constraints, technically this is not a pure "housing wealth" effect.

mortgage debt by 1% for each 1% increase in home prices. Using UK micro data, Campbell and Cocco (2005) find a large degree of heterogeneity in the house price elasticity of consumption across young and old cohorts of the population. According to their estimates, old homeowners change their consumption much more strongly in response to house prices. Thus, their results suggest that the aggregate effects of house prices on consumption should be stronger as the population ages. In contrast, Calomiris et al. (2009) argue that many of the empirical studies that find large wealth effects do not take into account the possible correlation between house prices and households' long-term income expectations, that is their "permanent income". Using state-level US data, they correct for the bias that this correlation could create and find that housing wealth does not have a significant effect on US consumption. Attanasio et al. (2009) reach similar conclusions for British households. However, even though the effects of house prices on consumption generate some disagreement, there is consensus on the increasingly prominent role of housing in explaining business cycle fluctuations (see for example IMF, 2008). In this respect, Leamer (2007) observes that since World War II, eight out of ten recessions in the US were preceded by changes in residential investment.

Macroeconomic implications of rising household debt

High household indebtedness can have large macroeconomic implications for two different reasons. First, as shown by the recent financial crisis, over-indebtedness can lead to financial distress and exacerbate the effects of a crisis. In this respect different policies[18] could have a preventive role in the build-up of the crisis. Second, high household indebtedness can also have important consequences in normal times by increasing households' exposure to macroeconomic fluctuations.

Debt and financial distress

High household indebtedness impacts economic downturns. The recent financial crisis led to the most severe recession since the Great Depression. A striking similarity between the two crises is that both were preceded by a dramatic increase in household leverage: household debt exceeded 100% of GDP only twice in the last century of American history: in 1929 and in 2006.[19] Fisher's (1933) debt deflation theory highlights the active role of deteriorating credit market conditions during an economic downturn. In a nutshell, his theory implies that an interaction between high household leverage and negative supply or demand shocks can exacerbate a downturn.[20] Glick and Lansing (2010) argue there are three common patterns, observed across different countries between 1997 and 2007, that

18 We are not strictly referring to monetary policy, but to a broad range of policies that include financial regulations or fiscal policy that could have an impact on household debt.

19 See Mian and Sufi (2010b).

20 Interestingly, King (1994) draws a similar parallel between the 1930s and the crisis experienced by many industrialized countries in the 1990s. He stresses how the countries experiencing the most severe recessions were also those where private debt burdens were highest prior to the downturn.

enable us to understand the role of debt in the build-up of the crisis and the subsequent economic recovery.

- First, household debt increased considerably and at a faster rate than disposable income in many countries before 2007.
- Second, there is a positive correlation between the rapid increase in household debt and house prices.
- Third, countries experiencing the largest increase in debt have also experienced the most severe depressions.

Glick and Lansing conjecture that in many countries household deleveraging will bring more defaults or considerable cuts in spending. Recent survey-based evidence shows that indeed US households responded to their deteriorated financial situation by cutting spending. More precisely, in 2009 they increased their savings by paying down part of their mortgage debt rather than increasing their contributions to retirement or savings accounts (see Chakrabarti et al., 2011).

Are highly indebted households more vulnerable to shocks?

High household debt and volatility. Higher debt can also have large macroeconomic consequences by increasing households' vulnerability to shocks, including income, interest and asset price risk:[21]

- **Income risk.** Unemployment is probably the biggest negative income shock that a household could face. To become unemployed and have a mortgage could have adverse consequences, even though unemployment insurance may temporarily limit the drop in income.[22] The big fall in income will make it difficult to maintain the mortgage payments and a large debt and negative equity could considerably reduce households' mobility in search of a new job.[23] This negative effect can be mitigated by the fact that homeowners can better absorb a negative shock by extracting equity from their houses. In this respect, British renters are more likely than homeowners to cite "unemployment" or "higher than expected interest rates" as a reason to experience debt-repayment difficulties.[24] Using US data, Hurst and Stafford (2004) show that households with little liquid wealth are more prone to extract equity from their homes in response to a negative income shock. Moreover, there is a vast

21 See also Debelle (2004) and Dynan and Kohn (2007) on the macroeconomic consequences of high household debt.
22 This is especially true in a country with a well-developed welfare system like Sweden.
23 For this last channel, see Sterk (2010). Empirically, both Ferreira, Gyourko and Tracy (2010) and Chan (2001) find that homeowners with negative equity are less mobile. In theory, there could be also forces that increase mobility among people with negative equity (see Schulhofer-Wohl, 2010). For example, if the loan is nonrecourse a homeowner's best choice could be to default and move. Moreover, homeowners could choose to move if they could rent out their house. However, this might be less relevant for Sweden, a country with highly regulated rental markets and full-recourse loans.
24 See Waldron and Young (2007).

literature stressing the role of financial deregulations on macroeconomic stabilization. For example, Dynan et al. (2006) argue that developments in credit markets that have enhanced households' and firms' ability to borrow played a crucial role in the stabilization of economic activity in the mid-1980s. Campbell and Hercovitz (2006) reach similar conclusions.

- **Interest rate risk.** Increases in interest rates have a direct impact on households' ability to service their debts. The immediate impact of interest increases will depend on the number of households that have floating-rate compared to fixed-rate mortgages. This channel is particularly strong in countries where adjustable-rate mortgage (ARM) contracts are more common, like Sweden, but less so in countries with predominantly fixed-rate mortgages like France, Germany and the United States (see Debelle, 2004).
- **House price risk.** Finally, changes in house prices will have an impact on highly-indebted homeowners changing the value of the asset side on their balance sheet. In principle, households planning to move in the future are more exposed to this risk (see Sinai and Souleles, 2005). A substantial fall in house prices could shrink home equity down to a level such that the mortgage debt on a property exceeds its market value. In the United States, survey-based evidence shows that in response to the recent decline in house prices the "effective homeownership rate", that is the proportion of individuals with a positive amount of home equity, has fallen by more than 7 percentage points since 2007 (see Chakrabarti et al., 2011).

To assess the relevance of these three channels it is important to look at the distribution of debt across households, quantify to what extent society as a whole is exposed to the risks of high indebtedness and take into account country-specific institutional differences that may alter these mechanisms.

What is special about Sweden?

In addition to fundamental factors, local housing demand and supply characteristics are important. Using standard fundamental explanatory factors such as growth in disposable income, the age of the working population, interest rates and rent-to-price ratios, Swedish real estate markets have frequently been identified as being out of line with fundamentals (IMF, 2004, 2008, 2009; The Economist, 2010). However, treating credit and housing markets as homogenous across countries could be misleading. In this respect, there are some important features of the Swedish economy such as (i) a highly regulated housing market; (ii) limited buy-to-let market; (iii) credit market structure and equity withdrawal; and (iv) debt distribution.

A highly regulated housing market

A striking feature of the Swedish housing market is the high level of regulation. Rent regulations were first introduced in 1940 and, despite some reforms in the 1970s and in the 2000s, the rental sector is still highly regulated today.[25] The largest proportion of the rental market is public and rents are set according to a cost approach. Rents in the public housing sector in practice set a cap on those in the private sector. Therefore, rents in Sweden generally do not reflect the market value of an apartment, especially in metropolitan areas. Regulations are also present in the owning segment of the housing market. The most common alternative to renting is to be member of a cooperative housing association (bostadsrättsförening). In practice, the most significant difference between being a member of a cooperative housing association and owning an apartment is that the former limits a homeowner's right to sublet the flat. These regulations create a number of distortions that need to be taken into account when evaluating households' borrowing decisions and the development of house prices in Sweden:

- First, rent regulations partially invalidate the use of the price-to-rent ratio to evaluate possible deviations of house prices from their fundamental values. In the empirical literature, large departures of house prices from rental prices are interpreted as a warning signal for the possible upsurge of a bubble. However, if rental prices are kept artificially low by regulations, the link between rents and prices breaks down and the rent-to-price ratio may not reflect fundamental values. As pointed out by Englund (2011), in Sweden, deviations of house prices from rents might simply reflect an increasing gap between market and regulated rents. Frisell and Yatsi (2010) criticize the use of the price-to-rent approach in Sweden and argue that behind the remarkable increase in house prices there are mainly fundamental reasons such as lower real interest rates and higher labour income. Changes in housing demand, caused for example by changes in taxation, and variation over time in the maximum LTV ratio are important factors that explain house price fluctuations in Sweden according to Walentin and Sellin (2010).[26]
- Second, as a result of the high level of regulation in housing markets, a buy-to-let market has never fully developed in Sweden. This has reduced the scope for speculation in the housing market.[27]
- Third, the main effect of rent control in metropolitan areas is to create a mismatch between demand and supply; as a result, queues for a rental apartment in central Stockholm can be as long as 10 years. This may force young households to buy a house earlier in life than they would have otherwise preferred and therefore to be more leveraged. Due to the regulation of the housing market, in practice there is no real trade-off for Swedish households between renting and owning.[28] The lack of a

25 See OECD Economic Survey: Sweden (2007) and Englund (2011) for more details.
26 See also Claussen et al. (2011).
27 In this sense, a house in Sweden is more of a consumption good than an investment good.
28 Here we mainly refer to big metropolitan areas.

well-developed rental market can force households to buy even if their investment time horizon is short and in this sense they are more exposed to house-price fluctuations.

- Fourth, housing regulation and a high cost of construction have contributed to a low level of new housing construction compared to other European countries (see OECD, 2007).

To summarize, the high level of regulation in housing markets may increase household exposure to house price fluctuations and distort household borrowing decisions and this calls for extra caution when evaluating the level of overheating in housing markets. On the upside, the resulting underdevelopment of a buy-to-let market may discourage potential speculation in housing markets.

Some important differences in credit markets

Most real estate contracts in Sweden are at floating interest rates and all mortgage debt is "full recourse". Adjustable-rate mortgage contracts are predominant in Sweden and account for about 2/3 of all mortgage contracts.[29] Mortgage debt in Sweden is full recourse, which implies that the borrower is personally liable for the full amount of the loan, regardless of the market value of the underlying housing collateral. These factors could increase highly-indebted households' sensitivity to house price risks:

- Adjustable-rate mortgages can increase households' sensitivity to interest movements, as well as the sensitivity of house prices to interest rate movements, since in this case the change in interest rates will affect not only new borrowers but also a large share of outstanding loans.[30] This last prediction is confirmed by Assenmacher-Wesche and Gerlach (2010), who study how different housing markets affect the impact of monetary policy on property prices in different countries, including Sweden. Indeed, using a VAR analysis, they estimate a higher degree of sensitivity of house prices to monetary policy shocks in countries where ARM contracts are more common.
- Full-recourse loans may mitigate the effects of excessive borrowing on financial stability. As they are personally liable for their debts, people may be more cautious in their borrowing decisions. Moreover, in this case the issuer's/lender's recovery is not limited to the collateral. On the other hand, it implies that the cost of not being able to repay debt is particularly high for Swedish households.[31] For example, in periods of high interest rates and declining house prices, Swedish households may have a higher propensity to cut their consumption to be able to service their debts. In this respect it

29 Johansson et al. (2011) also show that this share has been increasing over time.
30 In theory, households should take into account interest rate risks when making their optimal choice between ARM and FRM contracts. However, Campbell (2006) shows that households' mortgage contract decisions are sometime difficult to rationalize.
31 See also Andersson and Lindh (2011).

would be useful to use international data on countries with a similar legal framework as Sweden to quantify this effect.

Savings and home equity withdrawal

Home equity withdrawals appear limited in Sweden. Rising debt and decreasing savings have been a constant pattern in the United States for the last 20 years. Negative savings and rising debt can reflect home equity withdrawals. The situation looks quite different in Sweden. In recent years, savings have been positive and increasing most of the time. Looking at the Swedish savings rate, one could conclude at first glance that Swedish households do not refinance their mortgages for consumption purposes. However, the ratio between secured housing credit and dwelling investments shows a different picture. On average, home equity withdrawal amounted to about 4% of disposable income at the end of 2009 (see Sveriges Riksbank, 2010). However, aggregate data give only a very rough measure of this phenomenon. For policy purposes it would be more useful to undertake a micro data study, as in Mian and Sufi (2010a), and have more precise estimates in this respect.

Debt distribution

Debt distribution matters for debt sustainability. To properly assess the risks connected with high debt, it is important to look at debt distribution in society as a whole rather than at the average. In previous Financial Stability Reports, it has been argued that the current debt level in Sweden does not represent a serious threat to financial stability. However, even if the majority of Swedish households appear to have good margins in terms of their ability to service debt (see Jönsson et al., 2011, and Sveriges Riksbank, 2009), new borrowers seem to be more exposed to unemployment and interest rate risks (see Jönsson et al., 2011). Almost 60% of total debt belongs to households at the highest end of the income distribution; these are less likely to default on their mortgage payments in the event of a downturn, but also less likely to actually be hit by an unemployment shock. Nevertheless, comparing debt levels of households in different income categories does not give the full picture. This is especially true in a high-tax country like Sweden. In practice, contrary to the situation in the United States, income distribution in Sweden is basically flat. However, wealth distribution provides a different picture in that it is much more skewed.[32] In this sense, the debt-to-asset ratio could be more informative when evaluating debt sustainability. Aggregate data show that this ratio has been stable over time. A potential drawback of using this approach is that housing wealth constitutes the largest share of household wealth. Thus, in this sense households have also become more exposed to house-price fluctuations. Moreover, disaggregated data show that a significant fraction of Swedish households has little wealth.[33] In this regard, it would be useful to use both

32 See Domeij and Floden (2010).
33 See Domeij and Floden (2010) and Domeij and Klein (2002).

debt-to-income and debt-to-asset ratios in Sweden to estimate the probability of missing debt payments. In the United States, the second measure has a better predictive power according to Dynan and Kohn (2007).

CONCLUDING THOUGHTS

What explains the observed rise in household debt over the past two decades? Economic theory offers a rich set of potential explanatory factors such as increased expected future income, low real interest rates, diminished uncertainty, changes in demographics and financial innovation. However, empirically discerning the contribution of each of these factors has proven to be a difficult task. Many of these variables are highly endogenous or hard to measure and this has made it difficult to discern causality from mere correlation. In the United States, the easing of credit constraints and rising house prices have been pointed out as two important causes of increasing debt. A growing empirical literature suggests that there is also a link between a lack of financial literacy and over-indebtedness. In Sweden, there is some evidence to show that a combination of low real interest rates and more generous LTV ratios can explain most of the observed increase in debt.[34] However, we are not aware of any comprehensive study that uses micro-data to also assess the impact of increasing house prices, credit supply or changes in disposable income on household indebtedness in Sweden. Some recent survey-based evidence has documented a lack of financial literacy among Swedish households that could probably lead to an excessive build-up of debt. Moreover, even "financially educated" people could make financial mistakes and take on too much debt by judging current low levels of interest rates as permanent and the current appreciation rate in house prices as everlasting. A long period of low interest rates and increasing house prices could create and reinforce this misperception. Understanding the evolution of real-time beliefs about house price appreciation or interest rates is therefore central to understanding housing markets and household debt decisions. Collecting more data on these issues would be useful for policy purposes. Moreover, economic policies that aim to increase transparency about financial conditions, such as the decision to publish the Riksbank's projected interest rate path,[35] could also help in this respect.

Judging whether the current level of household indebtedness is sustainable or whether house prices in Sweden are driven by a bubble is an even more demanding task. There is some evidence to show that house price fluctuations could mainly be explained by fundamental factors, such as real interest rates and disposable income. Nevertheless, we believe that some caution is needed in this respect. Predicting house price bubbles has proven to be very difficult and in the last US house-price cycle economic theory provided little guidance in judging what should be a reasonable level of house prices (see Foote et al., 2010). Both debt-to-income and debt-to-asset ratios are informative measures when

34 See Finocchiaro and Queijo von Heideken (2007).
35 Since January 2007, the Riksbank publishes its own forecast on future developments of the repo rate.

assessing household debt sustainability. We think that it would be useful to use both ratios, at a disaggregated level, to estimate the probability of missing debt payments in Sweden and to evaluate which of the two measures have a better predictive power.

Nonetheless, irrespective of whether or not we believe that households are over-borrowing and housing markets are overheated, there are indeed some special institutional settings in Sweden, such as the high degree of regulation in housing markets or the widespread use of ARM contracts, that may potentially increase indebted households' exposure to house-price and interest rate fluctuations. That said, whether monetary policy is the right instrument to constrain household debt and limit the associated risks is still an open question. An increase in the policy rate would have an impact on both households and firms. The actual borrowing cost faced by indebted households is also influenced by fiscal factors, for example interest rate deductibility, that are disconnected from monetary policy. Increasing interest costs by gradually reducing the degree of deductibility is another example of a tailor-made solution to dampen the increasing trend in indebtedness. Moreover, a change in interest rates will affect not only new borrowers but also a large share of outstanding loans and higher interest rates may induce borrowers to amortize their loans less. On the other hand, a cap on LTV ratios, like the one mandated by Finansinspektionen since October 2010, could potentially induce people to borrow less and thus slow down the rate of increase in indebtedness. Economic policies that create incentives for people to amortize could have a dampening effect on existing debt levels. Finally, heavily regulated rental markets and high construction costs have also contributed to a shortage of housing in metropolitan areas. Limited supply may have played an important role in the development of house prices and indebtedness.

Going forward, to properly assess the risks stemming from household balance sheets and housing, regulators will need to continue developing micro data on household borrowing and assets. The assessment of micro data on the households will also need to be better integrated into aggregate models for policy simulation and analysis.

Such steps could improve our understanding of household indebtedness and the risks it poses to macroeconomic and financial stability. The Riksbank's inquiry into the risks in the Swedish housing market is a first attempt in this direction.[36]

36 See Nordberg and Soultanaeva (2011) for a description of some of the new data that will be used by the Riksbank to study housing markets.

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From the gold standard to price level targeting: Swedish monetary policy in the daily press during the 1930s

Benny Carlson*

In September 1931, Sweden was forced to abandon the gold standard and the main objective of Sveriges Riksbank became to stabilize the domestic price level instead of upholding a fixed exchange rate. It was the first (and only) time a country had adopted such a policy of price level targeting. This article reviews the reports and the arguments presented in six leading daily newspapers in connection with and following Sweden's transition from the gold exchange standard to the paper standard. This provides an understanding of how the experiment developed and took shape, the positions held by different actors and how these positions changed, and what information the general public – in this sensitive childhood of democracy – had access to.

INTRODUCTION

In September 1931, Sweden was forced to abandon the gold standard and became a world pioneer by establishing a monetary regime aimed at stabilizing the domestic price level instead of upholding a fixed exchange rate. Sweden is thereby regarded as having anticipated much of the inflation targeting policy pursued by a number of countries – among them Sweden – from the 1990s and onwards.

The credit for Sweden's pioneering role is usually ascribed to Swedish economists working in the spirit of Knut Wicksell.[1] In the interwar era, these economists were exceptionally focused on policy analysis and they exerted great influence upon politicians, authorities and the general public. A prerequisite for the functioning of the unique price stabilization project seems to have been that it could unfold in connection with a lively public debate. In any case, this was how economists, politicians and other pundits acted.

The story of the origin and development of the Swedish monetary programme of the 1930s has been extensively told with the help of literature, official records and documents

* Benny Carlson is professor of economic history at Lund University School of Economics and Management. This work has been carried out on behalf of the Riksbank and the Bank of Canada. The author is grateful for comments from Göran Ahlström, Claes Berg, Lars Jonung and Kerstin Mitlid.

1 Knut Wicksell's norm of price stabilization, framed within *Geldzins und Güterpreise* 1898, stated that the central bank should keep the price level constant through the use of its discount rate.

from the Riksbank (Berg & Jonung 1999 and Jonung 1979a, 1979b, 1993).[2] The purpose of this article is to *complement* (but not recapitulate) the existing picture through an investigation into the treatment of the new policy in Swedish newspapers. The purpose is more precisely to conduct a review of the reports and the arguments presented in news articles, debate articles and editorials in six leading daily newspapers in connection with and following Sweden's transition from the gold exchange standard to the paper standard. The six papers are (in order of size of circulation) *Stockholms-Tidningen (ST), Dagens Nyheter (DN), Svenska Dagbladet (SvD), Nya Dagligt Allehanda (NDA), Social-Demokraten (SocD)* and *Göteborgs Handels- och Sjöfartstidning (GHT)*. *ST, DN* and *GHT* can be labelled liberal (in the European sense of the word), *SvD* and *NDA* conservative and *SocD*, of course, social democratic. Through these newspapers one can gain an understanding of how monetary matters were treated in news reports and editorials as well as of the positions of politicians and economists. Leading Swedish economists wrote regularly in these newspapers, Gustav Cassel in *SvD*, Eli Heckscher in *DN* and Bertil Ohlin in *ST*, but a few others also aired their views from time to time, above all Sven Brisman in *GHT* and Gunnar Myrdal (through interviews) in *SocD*.

Table 1. Important actors and their positions 1931-1937

Sven Brisman	Economist, professor at the Stockholm School of Economics
Gustav Cassel	Economist, professor at Stockholm University, emeritus from 1933
Carl Gustaf Ekman	Liberal politician, prime minister 1930-1932
Arthur Engberg	Social democratic politician, minister of education from 1932
Felix Hamrin	Liberal politician, minister of finance 1930-1932, prime minister in the autumn of 1932
Eli Heckscher	Economist, professor at the Stockholm School of Economics
Erik Lindahl	Economist, professor at the Gothenburg School of Business, Economics and Law from 1932
Gunnar Myrdal	Economist, professor at Stockholm University from 1933, social democratic member of the Riksdag from 1934
Bertil Ohlin	Economist, professor at the Stockholm School of Economics
Ivar Rooth	Governor of Sveriges Riksbank
Al Vanner	Social democratic politician, editor of *Tiden*
Ernst Wigforss	Social democratic politician, minister of finance from 1932
Gustaf Åkerman	Economist, professor at University of Gothenburg
Johan Åkerman	Economist, associate professor at Lund University from 1932
Anders Örne	Director-general of the Postal service, Social democratic member of the Riksdag until 1934

Note. When no years are given, the position is valid for the whole period 1931-1937. Years mentioned consequently only indicate that a position has begun or ended within this period.

A systematic review of these papers has been conducted from 20 September 1931, when Britain abandoned the gold standard, up to turn of the year 1931/32. Thereafter certain occasions in 1932, 1933 and 1937, when important decisions were taken and lively discussions on monetary policy unfolded, have been scrutinized. Furthermore, contributions

2 Other recent books touching upon these events with the Riksbank, politicians and international developments, respectively, in focus are Wetterberg (2009), Johnson (2010), Ohlsson (2010) and Ahlström & Carlson (2006).

from three leading economists, Cassel, Heckscher and Ohlin, have been investigated up to 1937.[3]

This article is a summary of a considerably more extensive Swedish version based on some 400 articles. It is not possible to account for all of those articles in a condensed English-language version. Hence, references are only given to articles with an explicit author. Anyone interested in a complete list of references will have to consult the Swedish version, which will bepublishedby the Knut Wicksell Centre for Financial Studies at Lund School of Economics and Management.

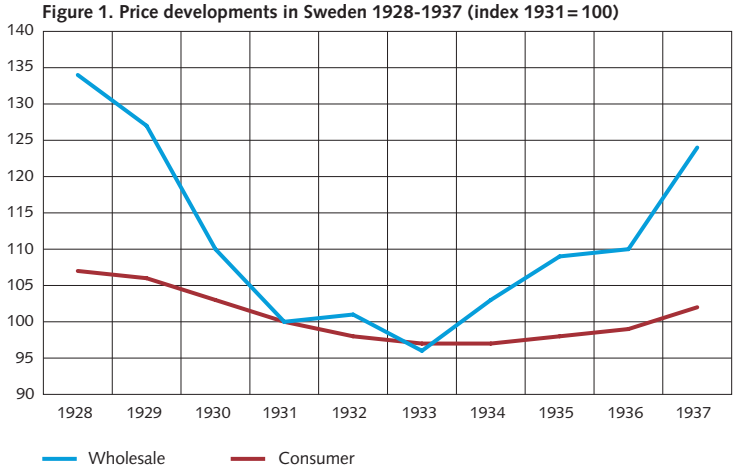
BACKGROUND SKETCH

At the outbreak of World War I in 1914, the Riksbank suspended its obligation to exchange notes for gold. After the war, in 1924, Sweden was the first country in Europe to go back to gold. As the ambition was to resume the parity from 1914, a forceful deflationary policy was pursued. The consequences of this policy were unemployment and stagnation, which, according to Fregert and Jonung (2003, p 431), undermined confidence in the gold standard. Sweden, however, experienced seven good years (1924-30) and Eli Heckscher (1931, p 17) concluded in an analysis of Sweden's situation that "the monetary crisis has *not* given any reason to revise reasonably modest notions of the growth of Swedish wealth in the post-war era". Sweden had undeservedly been dragged into the world depression.

The Great Depression came into full bloom after the stock market crash in New York in the autumn of 1929. The economic progress of the preceding years had rested on a treacherous foundation, not least through the war reparation and debt demands which followed from the Treaty of Versailles. Gustav Cassel had repeatedly warned against the impending disaster when payments of unreasonable reparations and war debts caused an accumulation of gold in the United States and France and these countries "sterilized" gold instead of adhering to the principles of the gold standard, which led to a world-wide scarcity of gold and falling prices. The deflationary school, which argued that the falling prices must reach their bottom level before any improvement could occur, was according to Cassel (1941, p 137) the villain of the piece: "As nobody could tell […] where the bottom was, the decline was bottomless."

3 Bibliographies or article registers are available for these three economists, namely Carlson & Jonung (1989), *Eli F. Heckschers bibliografi* (1950) and Carlson, Orrje & Wadensjö (2000).

Figure 1. Price developments in Sweden 1928-1937 (index 1931 = 100)



Sweden was drawn into this maelstrom later than most other countries. Karin Kock (1931, p 143-46) noted "that, firstly, the depression did not reach Sweden until mid-1930, that is considerably later than in most other countries, and that, secondly, it has not shown the same strength here as in other places". This, however, meant that the Swedish balance of trade deteriorated since imports were hardly reduced at the same time as exports fell when the depression hit Sweden's export markets. For a while, the effect on the balance of payments was counteracted by an inflow of short-term capital, since "Sweden's reputation as a safe haven was well consolidated". Later research (Lundberg 1994; Schön 2000) has more or less confirmed Kock's interpretation, even though the impact of the depression in Sweden has been dated somewhat later, in 1931.

In May 1931, international developments took a dramatic turn when the largest bank in Austria, the Creditanstalt, had to suspend its payments. Unrest spread through Central Europe and struck not least Germany, which was forced to raise its discount rate to 15 per cent and impose strict currency restrictions. During a few turbulent summer months, the currency reserve of the Swedish Riksbank was severely reduced and on July 31 the discount rate was raised from 3 to 4 per cent. However, an interest rate hike could not at this stage counteract an outflow of foreign capital.

On 20 September, the Bank of England decided to abandon the gold standard. Sweden now faced two options: to continue on the gold standard or to change to the paper currency standard. The first option would necessitate a restrictive monetary policy with a reduction of prices and wages in order to reduce imports and make exports more competitive. This would take time and cause increased depression and unemployment. Sweden sought a foreign loan to buy time, but failed (Heckscher 1931, p 23-24; Kock 1931, p 152-54). Consequently, only the second option remained. Sweden followed the same path as many other countries: "In all, 38 countries followed Great Britain. Of the major countries only the United States, France and Germany stayed on gold […]." (Wetterberg 2009, p 282)

BRITAIN ABANDONS THE GOLD STANDARD

On Sunday 20 September 1931 Britain decided to abandon the gold standard; the Riksbank raised its discount rate from 4 to 5 per cent. This event seems to have taken Swedish news editors – especially at *SocD* – by surprise. The tone in most papers was grave but for Sweden's part reassuring or calling for calm. On the following Tuesday, the governor of the Riksbank, Ivar Rooth, declared that the Bank intended to stick to gold.

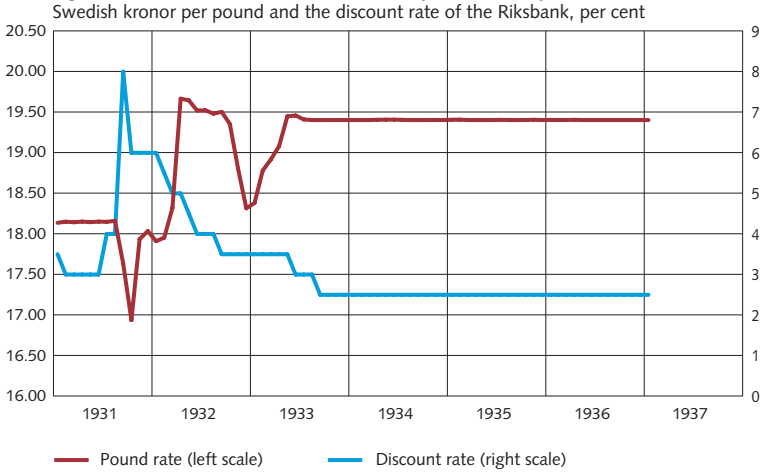
The views of leading Swedish economists differed. Cassel (1931a) saw the event as a worldwide economic disaster and stressed that Sweden must mobilize all resources to defend the connection between the krona and gold. Heckscher (1931a) put forward the idea that an international currency based on a stable monetary value could be more useful than the gold standard. According to Ohlin (1931a), the event was not completely unforeseen and would soon force the Scandinavian countries to make a choice. Brisman (1931a) referred to Keynes and did not find the event unfortunate at all; Britain had "entered upon a road which other countries might also use". However, he envisioned a return to the gold standard once the currencies had been depreciated. In *SocD,* the interpretation of what had happened was sharply ideological and politician Arthur Engberg (1931a) wrote about the "bottomless anarchy" of capitalism which only socialism could cure.

SWEDEN DEFENDS THE GOLD STANDARD

Rumours saying that Sweden would abandon the gold standard abounded within and outside the country. However, Felix Hamrin, minister of finance in the liberal government, declared that the Swedish government had no reason to discuss such a step and that the management of the Riksbank intended to "energetically hold on to the gold standard". In an editorial, *NDA* gave its support to the minister while an editorial in *GHT* found both alternatives – to hold on to or abandon gold – to be open. On Thursday 24 September, the Riksbank raised its discount rate (diskonto) from 5 to 6 per cent. Several newspapers – *ST, SvD, GHT* – questioned this action.

Cassel (1931b) was pleased by the determination to hold on to the gold standard but demanded a monetary policy "in organic connection with our entire economic and social policy", which in plain language meant trimming the welfare policy which kept prices and wages on an altogether high level. Heckscher (1931b) also supported the defence of the gold standard and seemed convinced that it would succeed.

Figure 2. Pound rate and discount rate January 1931-January 1937
Swedish kronor per pound and the discount rate of the Riksbank, per cent



SWEDEN ABANDONS THE GOLD STANDARD

On the evening of Sunday 27 September, the Swedish government and the Riksbank decided to abandon the gold standard at the same time as the Riksbank raised its discount rate to 8 per cent. Minister of finance Hamrin presented guidelines for monetary policy in the immediate future. The aim was to "defend the internal purchasing power of the Swedish krona by all means at hand" and strive towards a return to the gold standard when possible. Hamrin declared that the government would consider measures to improve the Swedish balance of trade and urged the Swedish people to buy Swedish products.

Cassel and Heckscher immediately raised their voices. Cassel (1931c), author of Hamrin's statement, concluded that the blame for what had happened was not with Sweden but with the international gold standard "which has completely fallen apart". The new task was to pursue a monetary policy aimed at a certain target, namely "that the internal purchasing power of the Swedish krona shall be maintained at its present level".[4] Previously, and under more difficult conditions in connection with the return to gold after the First World War, Sweden had demonstrated its ability to "regulate the purchasing power of its currency in a planned way". The present task was far simpler. If such a programme was carried through decisively it would eventually be possible to stabilize the external value of the krona. If, in due time, the international gold standard was resurrected, Sweden should be prepared to return to it.

Heckscher (1931c) deplored the decision to abandon the gold standard. He also held the view that monetary policy must "completely be aimed at the domestic price level".

4 Cassel had previously (1928, p 522) predicted what would happen if the value of gold in relation to other goods could not be stabilized: "[…] the unavoidable consequence must be that the gold standard will have to be abolished, and that the world's economy will have to be based on paper standards regulated with the single purpose of keeping the general level of prices constant." This statement has recently been noticed by Humphrey (2002, p 78).

Like Cassel he referred to experience gained during the First World War but drew another conclusion: it was very difficult to hold the price level steady. There were several price levels, it was perhaps not possible to create equilibrium in the economy with the help of a certain price index, the effects of discount rate policy were uncertain and free currencies were prey to international speculation. Heckscher foresaw a tough battle with "the friends of inflation", all those particular interests who asked for "new injections of credit or money to overcome all kinds of difficulties". In due course, one should strive for a return to the gold standard.

The immediate reaction of *SocD* was that it could be advantageous to be "master of the value of the monetary unit" and that the measure need not lead to inflation. *ST* called for calm and consideration. *NDA* was of the opinion that the minister of finance, with his statement, and the Riksbank, by raising the discount rate, had demonstrated that they did not intend to let inflation loose. Imported goods would certainly be more expensive and therefore it was important to buy Swedish goods. *GHT,* on the contrary, harshly criticised the new discount rate which was compared to a distress signal. The paper did not think much of Hamrin's statement about preserving the domestic purchasing power of the krona but rather argued that the policy was contradictory: the gold standard was abandoned to stimulate business through inflation and at the same time the discount rate was raised to curb inflation. The next day *ST* was also doubtful about the benefits of a higher discount rate. "Everything floats" was the headline of the editorial in *DN* which questioned the possibility of preventing violent price fluctuations. Representatives of the export industry, however, were very satisfied with the decision to cut loose from gold.

Within the social democratic camp, Gunnar Myrdal, Ernst Wigforss and Arthur Engberg expressed their views. Myrdal could see no risk for inflation but rather for global deflation. The uncertainty about price development was due to the fact that the British pound had turned into a paper currency "without any declaration of a monetary programme whatsoever". Sweden, however, had "done what Britain should have done" and the target of the constant price level constituted "the best possible monetary programme at the moment". Wigforss did not want to exaggerate the risks associated with a free currency. The question was: what was meant by inflation? There was no problem if Sweden had a constant price level while prices in countries on the gold standard kept on falling. Engberg (1931b) found, just like the editorial writer of *GHT*, that the government's statement was contradictory. He did not want to see any inflation since it would mean reduced real wages and pensions. A campaign to buy Swedish was unfolding. Engberg (1931c) emphasized that with a free currency imported goods would be more expensive and the imported volume would be reduced – to resort to import regulation under these conditions would be "spooky".

Ohlin (1931b) hoped for a British initiative for an agreement to stabilize currencies that had abandoned gold – this could restore order in the monetary system. The CEO of the Swedish Employers' Association, Hjalmar von Sydow, described the economic situation as "a muddle". "There can be inflation or deflation, about this one knows nothing." *SocD*

suspected that high finance was behind the opposition to the high discount rate. Myrdal explained that the high discount rate on the one hand demonstrated the determination of the Riksbank to preserve the value of the krona, and on the other hand could be interpreted as an indication that Sweden's situation was serious. By a stable price level he meant the cost of living – wholesale prices could very well be increased. In an article in *SocD* (Hult 1931), the idea of a "regulated paper currency" was traced back to David Ricardo. *NDA* argued for and *GHT* against the campaign to buy Swedish and the latter paper thought that some "moderately wise gentlemen" were playing with fire (the discount rate).

FIGHT OVER THE DISCOUNT RATE AND PRICE LEVEL

On one of the first days of October, Heckscher (1931d) dealt with the proposals for import regulation. Under the flexible exchange rate regime the exchange rate itself regulated imports and if speculators pushed the rate down under its equilibrium level the cause for import regulation was even more weakened. Several newspapers – *SvD*, *NDA*, *ST*, *GHT* – stepped up their criticism of the high discount rate, referring to protests from business, not least agricultural interests. Ohlin (1931c) declared that the general public must understand that the long-term deflation had come to an end. A slow increase in retail prices was unavoidable when stores filled their inventories with goods bought at higher prices. This meant, according to Ohlin, that the official bulletin in connection with the abandonment of the gold standard was obscure. It was impossible to prevent rising prices but no risk of a major increase in retail prices was at hand. In *SocD,* Engberg (1931d) fumed against *NDA* which had argued that social democrats on the board of the Riksbank had opposed a discount rate cut. He wanted to condemn this "clumsy attempt at political demagogy in a matter as serious as this one", forgetful of his earlier ravings about socialism as the only crisis solution.

SocD directed its attention towards the increasing interest in economics within the different organizations of the labour movement which had arisen in connection with the world crisis. The director-general of the Postal Service, Anders Örne, sharpened this question with his statement that most people do not understand economics better "than the cat understands a windmill". *DN* interviewed ordinary people in the streets on the causes of the crisis and the results seemed to confirm Örne's misgivings.

Now Heckscher (1931e) intervened with the message that a paper standard need not bring about price increase. When the krona declined in value import prices would increase, but if the monetary purchasing power (the stock of money) was kept constant the rise in import prices would bring down the volume of imports and this, combined with a minor decrease in the prices of domestically-produced goods, would mean that the general price level would stay put. *ST* asked in an editorial which purchasing power the minister of finance wanted to keep constant – the one in September 1931 or the one before the onset of the crisis in 1929. The paper thought a certain increase in prices would be reasonable and favourable to business. In *SocD,* Engberg (1931e), probably inspired by

an article by Rudolf Hilferding (1931) in the same newspaper, repeated the message that inflation means decreased real wages and increased profits. According to economist Gustaf Åkerman (1931a) in *GHT,* labourers in the domestic market had "profited" at the expense of consumers thanks to the deflation of preceding years.

SocD now struck a considerably less ideological note and supported Heckscher's position that domestic prices could be stabilized even if foreign exchange rates rose. The interest rate policy had to navigate between the inflation of Scylla and the interest rate burden of Charybdis. The paper put much faith in the ability of the Riksbank to "smoothly adjust" the price movement with "the discount rate screw" and took delight in the fact that government could not intervene in the domain of the Bank.

DISCOUNT RATE CUT AND PRICE INDEX DISCUSSED[5]

On 7 October, the board of the Riksbank decided to cut the discount rate by one percentage point to 7 per cent, arguing that no tendency towards inflation had been observed, but adding that it was important to produce swift and complete price information for future needs.

Papers like *ST* and *NDA* sided with Ohlin and Brisman, who argued that a certain increase in prices was inevitable and beneficial, and against Heckscher, who wanted to see decreased prices on domestically-produced goods compensate for increased prices on imported goods.

Minister of finance Hamrin did not make things any clearer when he made a statement saying that conditions now were so chaotic that they "defied any attempt at judging the future". Cassel (1931d), who concurred with the discount rate policy that had been pursued, agreed that the discussion on monetary policy of the last few days had been confused. He argued, however, that the statement of the minister of finance on September 27 had set the course: abandonment of the gold standard must not lead to inflation. The statement had been too general though since it had not made clear exactly "at which purchasing power one intends to keep the Swedish krona constant". The preceding deflation had pushed wholesale prices down considerably more than the cost of living and the best thing to do would consequently be to reduce the gap between these two price levels by allowing wholesale prices to increase. Cassel could also reveal that work had begun on the construction of a new price index. During a discussion at a meeting of the Swedish Economic Society there were also demands for a decision on what price level Sweden was to keep constant, but Heckscher urged those gathered there "to have some patience with the Riksbank, which might need a couple of weeks to sort things out".

5 On 9 October, the Riksbank distributed an inquiry regarding monetary policy to "three wise men", Cassel, Heckscher and David Davidson. Their answers were for many years tucked away in the archive of the Riksbank until they were discovered by Lars Jonung in the 1970s. See Jonung (1979b). One should consequently be aware that Cassel's and Heckscher's writings during October (Davidson did not write in newspapers) were affected by the issues with which they had been confronted by the Riksbank.

GHT claimed that the board of the Riksbank had "lost its nerve" when it raised the discount rate but that it had now calmed down somewhat. The paper did not believe that the Riksbank could exert control over the price level. *NDA* warned that the interest rate was still extremely high and found that fears of an inflation of the kind that had been experienced during the World War were unfounded. The preceding years had after all been marked by "a *deflation* of enormous scope and strength" where wholesale prices had fallen much more than the cost of living. Wigforss concurred in this diagnosis and said that there was "plenty of room for an increase in wholesale prices". There seems – as can be seen from earlier arguments from social democrats – to have been a dividing line between on the one hand Engberg, who was fighting inflation strenuously, and on the other hand Wigforss and Myrdal, who found deflation to be the most dangerous threat.

Cassel (1931e) diagnosed the condition of the world. It suffered from two monetary mental diseases, deflation mania and liquidity fever, of which the former had its root in the United States and the latter its major spread in countries on gold like the United States and France.

The labour movement continued its campaign for education in economics and Heckscher (1931f) raised the question of how economics was to be treated in the ordinary school education. He feared that the discipline might end up in the hands of "pedagogically less able – or dogmatically inclined, or inadequately trained – teachers" and recommended that economics be used as "a ferment, a leaven", in the discipline of history.

ANOTHER DISCOUNT RATE CUT AND CRISIS DEBATE

On 17 October, the board of the Riksbank decided to cut its discount rate from 7 to 6 per cent. *SvD* commended the Bank for this but *NDA* reminded its readers that the rate was still exceptionally high.

Cassel (1931f) reminded his readers that in order to uphold a certain price level one had to be able to control wages. Currency policy therefore had to be decided in harmony with the Swedish Trade Union Confederation, whereby "this organization will appear as an authority alongside the central bank". At a student meeting in Uppsala, Brisman found "the disproportion" between product prices and product costs "almost unbearable" and wanted to see prices increase. Myrdal's message was that Sweden's monetary policy could not be disentangled from "the international monetary movement". Cassel (1931g) agreed in his own way by launching another attack on the "gold-hoarding mania" of the United States and France with its ensuing deflation.[6] Engberg (1931f) attacked conservatives for wanting to reduce wages and certified that "a thorough sifting of credit in combination with a discount rate policy tied to careful index observations must produce rather good

6 In a speech in the autumn of 2010, Ben Bernanke, chairman of the Federal Reserve, compared the situation of the 1930s, when the United States and France, with persistent current account surpluses, sterilized the inflow of gold instead of allowing for price increases, and the situation today, when certain countries strive for persistent current account surpluses by maintaining undervalued currencies. See http://www.federalreserve.gov/newsevents/speech/bernanke20101119a.htm

possibilities for maintaining the internal purchasing power of the krona". Economist Johan Åkerman underlined that the Riksbank had to build a currency reserve to react to "temporary strains". *GHT* noted that the depreciation of the krona had reduced the import volume but that this was nothing to strive for, since only a normalization of exports would offer "permanent aid".

At the end of October, there was a discussion of the crisis at a meeting of the neo-liberal club and Wigforss explained that the departure from gold opened a way out for Sweden if only the general public could get used to the idea that monetary policy can be pursued without being on the gold standard. During this debate, Nils Stjernberg, professor of law, wanted to make the gold standard a question of principle: currency notes were "unconditionally binding promissory notes" issued by the state and in order to change their value a change of the constitution was needed. Brisman accused Stjernberg of making religion and not a practical tool out of the gold standard and *ST* likewise found that Stjernberg took "a rather unrealistic, formalistic stand". *DN,* on the other hand, sided with Stjernberg – one could not "blow away the judicial question as an irrelevant trifle".

Within the social democratic camp, views regarding the desirable development of prices were once again divided. Editorial writer Al Vanner (1931a) worried that the decreasing foreign value of the krona was the result of a "speculation launched for a certain purpose" which could end up in inflation. In that case the Riksbank had to use its discount rate. Wigforss, on the other hand, argued that after falling prices one had to think about rising prices. The decreasing external value of the krona was the subject of several explanatory attempts; *SvD* concluded that it followed the British pound downhill.

Ohlin gave the introductory speech at an annual fair in Västerås. His guidelines for Swedish monetary policy were stabilized internal purchasing power (retail prices) of the krona at its level of 1930 in combination with increased wholesale prices up to what was consistent with a depreciation of 15 to 20 per cent of the foreign value of the krona. To be able to handle the situation the Riksbank ought to secure a major foreign loan and keep its discount rate as low as possible. Johan Åkerman, on the contrary, did not want to see any such depreciation of the krona. Volvo's managing director, Assar Gabrielsson, wanted Sweden back on gold as soon as possible.

NDA gathered that many people had misinterpreted the motivation for a high discount rate by the Riksbank, that it was meant to "preclude any increase in prices of an inflationary character"; they had thought it was meant to "preclude any increase in prices". A recovery of wholesale prices would be fair indeed. *DN* noted that Swedish exports had not increased in spite of a 20 per cent depreciation of the krona. Vanner (1931b) in *SocD* reckoned the krona would soon appreciate when a reduction in imports and an increase in exports soaked through. The aim of monetary policy should be to keep the internal value of the krona steady without eyeing exchange rates. With a steady course from the Riksbank and the confidence of the general public, the new and free currency ought to entail more benefits than disadvantages. Vanner compared the new index in making to a barometer

which would indicate changes in the economic climate, so that appropriate measures could be taken in time, at the same time as there was no reason to fear the turn of the scales.

In mid-November, the experts (economists Erik Lindahl and Dag Hammarskjöld) who had worked to construct this "barometer" for the Riksbank revealed the price material they had chosen. *DN* contrasted the mathematical precision of exchange rates with the huge and complex price material, which strengthened doubts about the possibility of measuring purchasing power in a tangible way. At the same time, the paper expressed its gratitude to the Riksbank for its "energetic grasp at the very transition to paper currency" and for its continued steady grasp of developments. Pending the anchoring of a "firm and binding monetary programme" in the Riksdag, one had to be pleased by the authority of the Riksbank.

At the same, time the governor of Stockholm made a radio speech in which he launched a campaign to buy Swedish goods. *NDA* revealed that active planning regarding trade and monetary measures was underway at the Ministry of Finance and that "extraordinarily important decisions" were soon to come. According to *SvD,* the government was studying developments carefully but had sent word that no exceptional measures were in the making at the moment. An *NDA* editorial argued that the depreciation of the krona paradoxically stimulated rather than hampered imports: importers tried to get hold of as many goods as possible since they expected these goods to be more expensive in the future. The attitude of *NDA* in editorials as well as in its business section was that Sweden could not stand idly by while protectionist developments ruled the world.

When Myrdal (1931a) proposed the creation of an economic council consisting of energetic and influential men *DN* interpreted this as a search for "some kind of economic dictatorship" populated with "Mussolini material".

POUND PEGGING AND CURRENCY RATIONING

On 18 November, the Riksbank made headline news by pegging the krona to the pound sterling at a rate of 18.15, at the same time introducing a certain currency rationing: the banks had to compile lists of their customers' currency needs which were to be delivered to the Riksbank for review and decision.

The first press reactions were cautious. *SvD*, *DN* and *SocD* expressed sympathy for the measures. *ST* and *NDA* also showed some sympathy but pointed to the emergence of two pound rates, the one of the market and the one of the Riksbank.

For Ohlin (1931d) the most important thing at the moment was that the value of the krona could be "controlled within reasonable limits". This could be accomplished only through import regulation or currency rationing and he preferred the former measure. *SocD* countered Ohlin's contribution by saying that other countries would retaliate. Unfortunately, the command of private banks over foreign currencies made it impossible for the Riksbank to carry out "a planned, smooth and well balanced" currency rationing. *SvD* argued for higher customs duties.

Reports soon appeared saying that banks had delivered piles of invoices to the Riksbank, which was staggering under the load. Companies could perhaps not wait and were forced to buy currencies at the higher price of the free market. *GHT*, normally on the side of free trade, declared that both import regulation and currency regulation were madness but "when madness becomes epidemic" one had to adjust to it. The gap between the pound rate of the Riksbank and the market was increasing. *SvD* also questioned whether the Riksbank could sift through the piles of currency requisitions in a fair way and *SocD* talked of "an extreme work load". *NDA* went even further and told its readers that the Riksbank was "embedded in piles of invoices floating in from all over the country" and that the pegging of the pound would soon be abandoned. The policy of the Riksbank was described as "a complete failure" and the governor of the Riksbank, Rooth, was accused of "lacking the most basic preconditions to master the currency-technical questions produced by the financial crisis". The major mistake was that the Riksbank had not prepared for the action by building a reserve of pound notes. Now the choice was between strict currency control in line with a German model and completely free trade. *GHT* also emphasized the lack of a pound reserve and compared the pegging to the pound to "running around guided by a will-o'-the-wisp". *DN*, however, warned its press colleagues about fuelling the mood of crisis and thereby aggravating the situation.

THE RIKSBANK SOUNDS THE RETREAT

On 21 November, after only a few days, the Riksbank abandoned its attempt to peg the krona to the pound. The retreat was carried out in a fairly orderly fashion. Henceforth, private banks would take care of credit rationing in order to block imports not deemed "absolutely necessary".

ST and *SvD* immediately stated that the pegging to the pound had been doomed to fail beforehand – which the newspapers apparently had not themselves realized beforehand. *ST* and *DN* hoped that private banks would be able to handle the currency rationing in a better way. Engberg (1931g) directed his frustration against currency speculators, against the press which spread unrest and against conservatives who used scare tactics to get higher customs duties. *DN* concurred in criticisms of the unanimous "customs cry" by conservative newspapers and questioned whether the krona could be saved through "increased duties on luxury cars and bananas". *NDA*, however, noted with malicious pleasure that the Riksbank's initiative "had fallen to pieces".

In *GHT*, Gustaf Åkerman (1931b) expounded his views on the currency defence. The Riksbank ought to issue a firm declaration that it intended to counteract the fall of the krona by all possible means and possibly underline its resolution with a substantial discount rate hike. Åkerman pointed to Germany as an example of a country which had "accomplished quite astonishing things for the stabilization of its currency".

WHAT MUST BE DONE?

After the failure of the move to peg the krona to the pound, the discussion on what to do continued. Influential names – Cassel, Heckscher and Engberg – once again raised their voices. Cassel (1931h) described currency control as "the most haphazard and radical cutting off of the supply of goods so far invented" and pleaded for countries on the paper standard to come together and try to create stability in the inner purchasing power of each currency as well as in the exchange rates between currencies. According to Heckscher (1931g), all available means should be used to defend the stability of the domestic price level and avoid inflation as well as deflation. He once again argued that increased prices on imported goods could be neutralized if other prices were kept low. Engberg (1931h) concluded, from the fact that imports had not decreased in spite of the depreciated krona, that speculators had amassed goods, hoping for price increases due to import regulation, customs duties or further depreciation of the krona. He believed private banks had facilitated this speculation and demanded increased "public control and power over the banking and credit sector". Engberg (1931i) was convinced that the Riksbank could assert the internal purchasing power of the krona "with a microscope over price movements, a steady hand and authority over foreign currencies within the country". He also saw currency rationing as "a smoother and more effective way" towards balance between imports and exports than customs and import regulation. Such rationing should, to be effective, start out from "a general inventory with strict obligatory declaration". *GHT* and *DN* also discussed the question of speculation but opposed governmental "guardianship" and protectionism.

In late November, "Guidelines for Swedish monetary policy" were discussed within the Economic Society. Assar Gabrielsson once again pleaded for a return to gold at the old parity, arguing that a paper currency ran the risk of being politicized. Myrdal regarded such a return as a definite road to bankruptcy for Swedish business. He did not want any import regulations, but if such measures were deemed necessary the best thing would be to create a foreign trade monopoly. Anders Örne and Jacob Wallenberg, the influential banker, both warned against such a monopoly and believed in a return to the old gold parity. Heckscher found the paper currency to have the same drawbacks – and several others – as the gold standard. He wanted a return to gold at a parity corresponding to the price level one wished to keep constant. Brisman's opinion was that the Swedish krona should follow the British pound. *NDA* commented on the debate in an editorial which expressed pleasant surprise over the "comparative unity" among economists.

Ohlin had not participated in this debate but intervened with an editorial (1931e) and underlined that the statement of the government and the Riksbank, that the domestic purchasing power of the Swedish krona was to be defended at all costs, must be taken seriously. The Riksbank followed the development of prices carefully and had limited credits for imports from commercial banks. Pure currency rationing had to be avoided though, since this "was the most definite means of destroying confidence in a currency". Engberg (1931j) made it clear that if one – like some debaters in the Economic Society – wanted

to bring the krona back on the gold standard at the old parity, this would mean a higher interest rate, reduced production, unemployment and reduced wages. Furthermore, in these less normal times one could not count on a higher interest rate to attract capital into the country since it signalled increased risk. Brisman (1931b) was not worried by the depreciation of the krona against the U.S. dollar; on the contrary and in view of the situation for Swedish industry, the depreciation was hardly strong enough. Johan Åkerman once again pleaded for import duties on consumption goods but was attacked by free-trade oriented *DN*.

Wigforss (1931a) took an ambiguous stand. On the one hand Sweden had amassed large holdings abroad, which could make it possible to uphold imports in spite of falling exports. If this did not work out "a completely unpredictable depreciation of the krona abroad" threatened and in view of this even the most ardent free trader had to consider measures to restore the balance.

HECKSCHER AND MYRDAL ADVANCE PROPOSALS

In early December, Heckscher published a book, *Sveriges penningpolitik, orientering och förslag* (Sweden's monetary policy, orientation and proposals) (1931h), which for some time became the focus of the debate on monetary policy. Heckscher's advice was to keep domestic prices constant and allow only the inevitable increase of prices on imported goods. The book was praised the same day it was published in an *NDA* editorial, which summarized Heckscher's three alternative aims for monetary policy – going back to the price level of 1929, keeping the price level of domestically-produced goods constant and keeping a constant average price level taking increased prices of imported goods into consideration – and underlined that government had a distinct aim for monetary policy which was also embraced by the Riksbank.

In *SocD,* Örne agreed with Heckscher that domestic prices and not foreign exchange rates ought to be the guiding star when regulating a free currency, but said that he would not want to recommend increased political influence over the monetary system. *DN* made clear Heckscher's preferred alternative: to hold on to the price level which prevailed when the gold standard was abandoned without having to lower the prices of domestic goods in order to compensate for increased prices on imported goods, that is a more expansionary strategy than the one advocated by Heckscher before. Heckscher was praised for his determined stance for free trade, for his "thorough, impartial and responsible scrutiny of the monetary problem" and for having written the first popular presentation of the problem.

Over the next few days, a number of Heckscher's colleagues among economists – Cassel, Ohlin, Brisman and Emil Sommarin – appeared and gave their views of Swedish monetary policy. Cassel (1931i) presented his recommendations without mentioning Heckscher's book. He thought a substantially undervalued krona would help to equalize the balance of trade but that government on top of that had to resort to some customs duties, which would, unlike a big foreign credit, reduce unnecessary consumption of "coffee, silk

stockings and lousy movies". Cassel emphasized the need to "hold on to the programme of internal value stability of the krona in a steadfast way" and warned against all thoughtless talk of inflation.

Ohlin (1931f) discussed Swedish monetary policy in two major newspaper articles. In the first one he concluded that the government statement, saying that the inner purchasing power of the krona should be held constant, was a formula which had to be given a concrete meaning. The major problem was that price formation at the time of the abandonment of gold was sharply distorted and scattered. Consequently, different prices had to be adjusted, so that those that had fallen the most could be raised while those that had fallen the least could be left unaltered. In his second article, Ohlin (1931g) clarified what distinguished his monetary programme from Heckscher's. He described the alternative Heckscher was leaning towards – constant wholesale prices – as "semi-deflationary" and advocated "a compromise between constant wholesale prices and a return to the price system of 1929". The compromise would be to stabilize the cost of living at the level of 1930 and allow for rising wholesale prices so that production could continue without any need for decreased wages. Ohlin believed that his programme would cause a depreciation of the krona by 25 per cent in relation to the old parity, compared to 15 per cent according to Heckscher's programme.

Brisman (1931c) reacted against Heckscher's view that price increases should be limited to imported goods. "It is, however, the big export industries, including agriculture, which suffer from the worst conditions and which need a price increase the most." Furthermore, he argued that the price level can only be regulated through exchange rates and not through the discount rate. Since the capacity to regulate exchange rates was insignificant, Brisman found that the whole debate on price levels gave "an impression of fictitiousness".

Emil Sommarin, an economist from Lund University with social democratic leanings, accused Heckscher for having launched four different monetary programmes since the end of World War I. He dismissed the latest programme as "scientifically untenable" and harmful to Swedish business. A moderate price increase was needed.

Heckscher (1931i) for his part directed criticisms against Wigforss' book *Den ekonomiska krisen* (The economic crisis), among other things against Wigforss' statement that a reduction of the foreign value of the krona by 25 per cent from a competitive perspective was equivalent to a reduction of production costs by 25 per cent.

NDA criticized the view of "theoreticians" that a higher discount rate meant lower product prices. Practitioners realized that a high discount rate meant that all businessmen tried to make up for their interest rate losses through higher prices. Also, interest rates varied considerably between different countries while product prices moved in the same direction everywhere. Furthermore, it was practically as well as theoretically impossible to influence a certain category of prices (wholesale) while leaving others (retail) unaffected.

Wigforss (1931b) referred in an editorial with a certain amount of delight to Sommarin's attack upon Heckscher. He was (just like *NDA*) sceptical about discussions among

economists on what price level to stabilize and concluded that the aim "easily understood by everyone" ought to be a constant cost of living.

Another economist, the eccentric professor from Uppsala Fritz Brock, now entered the scene. He lived up to any expectations of eccentricity with a statement that if the price level was not kept constant production costs must increase, "since a price level that hovers above production costs is just as impossible as our friend Mustafa's Indian experience when he met a fakir and saw a girl hanging without a thread (by which to hang)".

Just before Christmas, *GHT* explained that even if the paper standard had not produced a golden age one had to consider the "unforeseeable complications and misfortunes" which would have followed had the country stayed on gold. In an editorial, the paper also concluded that economists had had a heyday when the whole world had been transformed into a monetary laboratory. The editorial was not convinced of the wisdom of economists but found comfort in the fact that "the learned men are fortunately seldom in agreement".

Around Christmas 1931, Myrdal published his monetary programme – in competition with Heckscher – in the book *Sveriges väg genom penningkrisen* (Sweden's way through the monetary crisis) (1931b). He preferred increased prices to reduced costs of production and argued that there could be price increases on imported goods of around 15-18 per cent and on domestic goods of around 5-8 per cent and that the cost of living index could increase by 2-3 per cent. This programme was immediately denounced by *DN* as "monetary bolshevism". The argument was that Myrdal did not want to restore a stable currency but wished to subordinate monetary policy under a general policy with social ambitions. Two economists of the status of Heckscher and Myrdal had arrived at contradictory conclusions: "Professor Heckscher seeks to show the way to free trade and individual responsibility, professor Myrdal to a bolshevist planned economy." However, a debate article in *NDA* (Guinchard 1931) was well-disposed towards Myrdal while the "reactionary" preaching in the leading organ of Stockholm liberalism (*DN*) was rejected with reference to Keynes's radical liberalism in Britain. *SocD* proposed the establishment of a state bank in order to amass savings which could serve as a cash reserve to be used in case of a return to the gold standard.

Ohlin (1931h) noted, as *GHT* had done a few days before, that the economic situation had not improved after Sweden abandoned the gold standard, but that the country had escaped "the threefold aggravation" of the depression which would have occurred had it stayed on gold.

WINTER OF 1932: BUDGET AND DEBATE IN THE RIKSDAG

While awaiting the government budget of 1932, Ohlin (1932a) discussed different monetary strategies. The strategies of pure deflation and inflation were not relevant. The remaining options were stable wholesale prices or stable costs of living and according to Ohlin the latter strategy would "create the kind of monetary stability which leads to the greatest possible stability in the business sector".

When minister of finance Hamrin presented the government budget in January he concluded that costs of living had been constant during the autumn and that consequently "the purchasing power of the krona in the hand of consumers has been upheld". The intention was to continue along the same road, which did not preclude adjustments of wholesale prices, and to stabilize the international value of the krona when the right conditions were at hand. *DN* as well as *NDA* complained that the government's message was obscure. Ohlin (1932b), however, found the declaration, which meant that the Riksbank should provide as much internal and external monetary stability as possible, to be very satisfactory.

In the Riksdag debate on the estimates the conservative leader Arvid Lindman criticized the aim of stabilizing the internal purchasing power of the krona, arguing that the price level had been fixed at its lowest and most ruinous point. He proposed an increase of the retail price level to where it had been in 1928-29. Olsson i Kullenbergstorp, leader of the farmers' party, attacked the high discount rate. From the right (Lindman) and the left (communist leader Karl Kilbom) the government was criticized for not having summoned an extraordinary Riksdag session during the autumn. Prime minister Carl Gustaf Ekman argued that an extraordinary session would not have had time to accomplish much and that protectionist measures would not have been warranted. Minister of finance Hamrin declared that the government had had nothing to do with the discount rate hike in connection with the abandonment of the gold standard. Leading social democrats like Arthur Engberg and Per Edvin Sköld defended the actions of the Riksbank. Editorial comments followed political party lines. *SvD* and *NDA* supported Lindman, *ST* and *DN* supported the government and *SocD* was pleased that the prime minister had turned against Lindman's "inflationary and duty-fanatical preachings".

A couple of weeks later, Cassel (1932a) criticized those who asked for lower interest rates. It was not possible to have artificially-low interest rates which did not correspond to the supply of and the demand for capital. Nonetheless, he questioned whether discount rate policy had not been too tight lately. The Riksbank could probably without risk cut its rate to 5 per cent. In a second editorial, Cassel (1932b) noted that other countries on the paper standard had not, unlike Sweden, stated a decided aim for their monetary policies. However, countries on the paper standard had a common interest in pushing down the value of gold since this would mean higher prices in gold countries and consequently increased activity in the world economy. Countries which had abandoned the gold standard had no use for gold reserves and could help to push down the value of gold by exporting gold. They should also focus on pursuing an independent monetary policy in the long run, preferably under the lead of Great Britain.

THE RIKSBANK STATES ITS AIM

In mid-February, the government presented a bill on continued exemption for the Riksbank from its obligation to exchange notes for gold. The bill was based upon a letter from the Riksbank in which it was stated that the preservation of the internal purchasing power of

the krona implied "that the costs of living will deviate only within narrow boundaries from their average in 1931". The aim was, more precisely, to keep the average price for domestic goods – and not the price for all consumption goods – constant, as an attempt to force down the prices of domestic goods to compensate for rising prices for imported goods would sharpen the crisis. The board of the Riksbank also declared that the time was not yet ripe to fix a programme for the longer run. The Bank also cut the discount rate from 6 to 5.5 per cent on the same day as the Bank of England cut its rate from 6 to 5 per cent.

Editorial comments in *NDA* and *ST* were, in spite of these signals from the Riksbank, harsh. *NDA* wrote that the bank would rather sacrifice businesses than allow prices to reach the levels of 1930 or 1929, that its rate cut was insufficient and that its call to commercial banks to uphold their credit restrictions was unfortunate. *ST* made similar comments.

Another debate started when conservative MPs, as well as Anders Örne, submitted motions in the Riksdag proposing revisions to the constitution in order to change the status of the Riksbank. Wigforss (1932a) turned against the conservative motions. The basic questions involved were whether the board of the Riksbank should represent different interest groups directly or through political parties and how the government and the Riksbank should cooperate. Wigforss wished to hold on to representation through political parties and did not want to "fit the bank into administrative organs under the direct control of government". The government anyway had a distinct role to play, since government authorities must decide on the general guidelines for monetary policy. Cassel (1932c) also discussed the position of the Riksbank. It ought to have an independent and authoritative position, on condition that its tasks were determined by government and parliament.

In late February, Ohlin (1932c) complained that credit policy was too tight. The Riksbank attempted, in spite of what had been declared, to compensate for increased prices on imported goods by pushing down prices on domestic goods. Like Cassel, Ohlin believed that the discount rate could be cut to 5 per cent – or less.

ECONOMISTS IN THE SPRING OF 1932

The next contribution by Ohlin (1932d) focused on the monetary policy the Riksbank wanted to pursue, according to a letter to the government, namely a policy which accepted a certain increase in its price index caused by increased prices on imported goods. This would involve a stabilization of the least depressed prices – retail prices on domestic goods – while wholesale prices would be adjusted upwards. Ohlin was pleased to note that this policy coincided with the guidelines he had proposed. However, so far the policy of the Riksbank had been more restrictive than what was implied by this programme.

Cassel (1932d) took on the task of comparing the internal purchasing power of paper and gold currencies and concluded that the Swedish krona had been "abnormally" undervalued. Paper countries had, according to Cassel, a strong position against gold countries which they should not yield but use to pursue a monetary policy to keep the general price level as constant as possible. Sweden had, Cassel (1932e) said in a second editorial, fully implemented the programme which was declared when the gold standard

was abandoned and had demonstrated that it was possible even under the most difficult circumstances to control the internal purchasing power of a currency. The expected minor increase in wholesale prices had, however, not occurred. A tendency towards deflation remained and paralyzed business life. Therefore, the Riksbank ought to cut its discount rate to 4.5 per cent and, furthermore, all unnecessary barriers to an increase in the issue of notes by the Riksbank should be removed. Sweden should also export as much gold as possible to improve its balance of payments. The prohibition against exporting gold was, Cassel (1932f) believed, motivated by a notion that the preservation of a gold reserve would facilitate a return to the gold standard. However, if one wanted to return to the old gold parity, the best method would be to export as much gold as possible to push down the value of gold.

Ohlin (1932e) once again investigated alternative monetary strategies: the restrictive one, which would result in "the whole credit system being frozen", the passive one and stabilization with constant retail prices and somewhat increasing wholesale prices. Ohlin said that the Riksbank had so far "been somewhat on the deflationary side" and that now "purposeful action" was needed.

Heckscher (1932) was also worried by the prospect of more deflation and underlined the double message of the official monetary programme: to prevent deflation as well as inflation. He found it decidedly inappropriate to retain the high discount rate if prices tended to fall. Ohlin (1932f) once again stressed that no efforts should be spared "which can counteract the emergence of a deflationary mood, nervousness and a frozen credit system".

THE REPORT OF THE BANKING COMMITTEE IN MAY 1932

In May 1932, a report by the parliamentary banking committee on Sweden's monetary policy was published and was subjected to considerable interest in the daily press. A lot of attention was paid to the criticisms of the Riksbank credits to the Kreuger company. The committee's viewpoints on past monetary policy were formulated by a majority of social democrats and liberals plus one conservative member and a minority of conservatives and members of the farmers' party. The minority criticized the board of the Riksbank in three respects: they should have secured a foreign currency loan already in the spring of 1931, they should have raised the discount rate immediately when Britain abandoned the gold standard and they should not have pegged the krona to the pound in November. Regarding guidelines for the future, a unanimous committee urged that the Riksdag should recommend a certain increase of the price level, which, however, must not be of a pronounced inflationary kind. A recovery of the level of wholesale prices should be allowed provided it did not cause any noticeable increase in the cost of living. The task was to prevent deflation as well as inflation and the recovery of prices must not aim at a price level too far back in time.

The report was commented upon in editorials in all six newspapers. *NDA* saw it as "foreboding that the inflationary scare is losing its grip on government". Ohlin (1932g)

in *ST* dismissed two of the criticisms of the minority but agreed on the third one, that the measure of pegging the krona to the pound in November had not served the reputation of the Riksbank. He found it satisfactory that the committee had stressed that price stability was not an end in itself but that monetary policy ought to see to the needs of business. That statement that the price recovery should not aim at "a price level too far back in time" was interpreted by Ohlin to mean that the level of 1930 and not 1929 was intended. *SvD* was delighted that the committee had "put emphasis upon much needed *anti-deflationary* measures" and hoped that the new programme, which allowed for increased prices on domestic goods as long as they did not affect the cost of living in a noticeable way, would be realized. In *DN,* the view was gloomy. The argument was that the committee gave "not just a little finger but runs the risk of losing the whole hand to inflationists". According to *SocD,* "influential circles" had attempted to undermine the position of the board of the Riksbank. However, the non-socialist parties had not been able to unite against "a banking policy inspired by social democrats" and the monetary policy had "through efforts from all parties been pulled out of the line of fire". The aversion against the governor of the Riksbank of which *SocD* spoke was clearly expressed in *GHT,* where it was argued that a change in the post was inevitable.

In a second round of editorial comments, Ohlin (1932h) emphasized the unity reached regarding the monetary programme and rejoiced to see that the Riksbank was to be given more precise instructions than before and above all "a distinct instruction to avoid not only inflation but also deflation". Wigforss (1932b) also saw an expansion of the earlier programme and was pleased by the committee's stand against both inflation and deflation. *NDA* thought the committee's programme revealed something new, "the understanding that present prices for agriculture and industry are untenable has finally penetrated political circles".

On the same day as the committee's report was discussed in parliament, Cassel (1932g) stepped forward with an editorial in which he commended its content: "It could be questioned whether in the whole world at the moment there is a country with such a firm and wise monetary programme." He was, however, critical towards the origin of the programme. It was the duty of government to put a proposal before parliament. Engberg (1932) focused on the contradiction involved when the critics of the Riksbank argued on the one hand that the bank should have secured a major foreign loan in the spring of 1931 and on the other that the policy after the abandonment of the gold standard had been too deflationary.

THE DEBATE ON THE REPORT IN THE RIKSDAG

The Riksdag debate on the report of the banking committee revolved firstly around monetary policy and secondly around the Kreuger credits. Here we will stick to the first theme. Social democrat Viktor Larsson, speaking on behalf of the board of the Riksbank, spoke against the committee minority saying that Sweden would not have been able, with the help of a foreign loan or a discount rate hike on 21 September, to uphold the gold

standard to avoid a rate hike when the gold standard was abandoned. Prime minister Ekman stated that the government and the Riksbank had conferred during the defence and abandonment of the gold standard. "Criticisms in this regard therefore apply to government also." However, the discount rate hike and pound pegging had not been discussed. The conservative leader Lindman argued that all forces must be focused on starting up production and that product prices must be raised. Wigforss touched upon similar thoughts.

All six newspapers commented upon the debate in editorials. Ohlin (1932i) found "an astonishing unity" concerning the guidelines for monetary policy and emphasized how important it was that it had been established that the needs of business must be considered. "Monetary policy guided by index numbers must not degenerate into index superstition." *SvD* also expressed delight at the unity concerning "a monetary programme, which does not allow any further deflationary development". *DN* focused on antagonisms in the debate and believed that the leftist majority, which sought assurance against inflation, had conquered. *SocD* concluded that differences of opinion "did not apply to central but only to peripheral matters". *GHT* did not wish to speak of a programme but only of "some wishful thinking taken to the protocol". *NDA,* finally, devoted all its interest to the Kreuger credits. *SocD* came back to the idea that conservatives and farmers wanted to get rid of the governor of the Riksbank, since he was opposed to inflation, and attempted to accomplish this in a roundabout way through the Kreuger case. *NDA* pressed for action: a discount rate cut, the abolition of credit restrictions and, above all, customs duties and import regulation.

CASSEL SCRAPS GOLD

At the end of May, Cassel (1932h) once again explained the severe crisis as a result of the increased value of gold. "The faith in gold as an eternal and absolute entity of value must be eradicated. The world economy must be footed on monetary units, which have a maximum possible fixed purchasing power against real utilities." He even believed that the world's gold reserves in due time would be transformed into "quite worthless scrapheaps". In mid-1932, Cassel (1932i) continued his argumentation with a historical survey of the value of money from Antiquity and onwards: People had not become wiser as time went by. In Antiquity, gold had been used for ornamentation or for other luxury or martial purposes, in modern times some of the richest countries of the world "amassed the larger part of the world's gold stock and tucked it down in the earth".

In the early autumn, Cassel (1932j) launched another attack on the prohibition against gold exports which had been introduced when Sweden abandoned the gold standard. The larger the amount of gold exported the better, since this could improve the balance of payments of the country and push down the world price of gold. Cassel also came back to the question of how a monetary programme had to be worked out. The government must take the initiative and put a proposal before the Riksdag and once this proposal had been

approved it had to be complied with by the Riksbank, which must be free to choose the means used to achieve the aims.

The relationship between wages and product prices was the next item on Cassel's (1932k) agenda. The level of product prices had fallen "in an extraordinarily violent fashion" since 1929. A reduction of wages was needed to restore economic equilibrium. It had certainly been better if product prices could be increased. But that was a programme for the world economy. Sweden could of course control its own price level. But when this level was raised a corresponding fall in the value of the Swedish krona abroad would follow.

In February 1933, Cassel (1933a) dismissed all hopes that a restoration of the international gold standard would offer an escape from the depression. Countries on gold tried to put the blame for deflation on countries which had abandoned gold. Cassel (1933b) protested against this: "Leading gold countries have been masters of their own price level and should never have allowed a fall in prices." In view of government plans to reduce unemployment with public works, Cassel (1933c) rebelled. The basic cause of unemployment was a worldwide fall in product prices. "The world programme" must therefore be a price increase of about 50 per cent. Sweden at the moment had to limit its price increase to 5 or 10 per cent.

In April 1933, Cassel (1933d) argued that public works had to be financed through an increase of the money stock and in this regard the Riksbank had failed. There was "a lack of economic planning". He (1933e) complained that the unclear relation between government authorities and the Riksbank still had a paralyzing effect on monetary policy. The government must present its monetary programme, preferably in May, when it anyway had to put before the Riksdag a prolongation of the exemption of the Riksbank's obligation to convert its notes into gold. Cassel reckoned that there was a basic agreement that such a programme had to proceed along the route that the Riksdag had mapped out in May 1932. Since wholesale prices had fallen by 5 per cent after September 1932, a price increase of at least 10 per cent had to be considered. And time was now short (Cassel 1933f): "For agriculture, for the industrial unemployed, for the whole Swedish business sector, a price increase which gets production going and makes it once again scantily profitable is an urgent thing, a thing which we cannot wait for week after week, month after month."

Heckscher (1933a) believed it would be difficult to carry out an isolated Swedish price increase before the business cycle, independently thereof, had moved into an expansionary phase. It may seem self-evident that an expansion of the money stock would increase monetary purchasing power and demand. However, this took for granted that the velocity of money was not affected by the business cycle and price movements, which was unrealistic.

THE MONETARY PROGRAMME OF 1933

At the end of May 1933, minister of finance Wigforss presented a government bill on the prolongation of the exemption to the Riksbank's obligation to convert its notes into gold in which the principles for Sweden's monetary policy were also outlined. The bill was based

on a document from the board of the Riksbank and a statement by currency experts. The board of the Riksbank had concluded that the possibilities for a small country dependent on foreign trade like Sweden to achieve an independent and regulated price increase were very limited. This fact should not prevent measures to provide relief for business and further a recovery of prices. Neither return to the gold standard nor attachment to any of the leading currencies were at the moment advisable. Also, monetary policy should not in a schematic way be fixed at a certain index number.

The currency experts – including Cassel and Heckscher – also focused on a regulation of the domestic purchasing power of the krona beneficial to business. The best way to achieve this would be through an increased world price level. If this could be achieved and the most important exchange rates were stabilized there would be no hesitation about pegging the exchange rate of the krona. If such a beneficial scenario did not occur, Sweden had to proceed with its independent monetary policy. The task would then be to prevent further deflation and aim for a moderate increase of the domestic level of wholesale prices. One would not in this case have to expect any increase in the cost of living. The Riksbank ought not to have any instruction except for a fixed target for monetary policy. The choice of means to reach this target would rest in the hands of the Riksbank.

Minister of finance Wigforss reiterated the views of the board of the Riksbank and the currency experts. At the moment, pegging the krona against any foreign currency was out of the question, monetary policy could not schematically be tied to certain index numbers and so on. With reference to the experts he thought there were better possibilities to influence the domestic price level than had been suggested by the board of the Riksbank. These possibilities ought to be taken advantage of as much as possible to reach the target, a moderate increase in the domestic price level. Wigforss also emphasized the importance of these measures being carried out without delay.

The bill was immediately commented upon by Cassel, Heckscher and Ohlin. Cassel (1933g) saw the programme as "a desired and needed specification of the line of thought in the principles of our monetary policy which were established by the Riksdag of 1932". Sweden had taken the first step along a much needed path out of the crisis "and there can hardly be any doubt that this first step must be a recovery of the general level of product prices".

Heckscher (1933b) wanted, just like Wigforss, to underline the importance of unity and swift action. However, he was sceptical regarding the possibilities of achieving an isolated price recovery in Sweden, but if the business cycle of the world was improving Sweden could anyway join it more swiftly by taking active measures. The Riksbank could "get going without fear of shadows".

Ohlin (1933a) could not detect any real news but the focus was somewhat different compared to the first formulation of the programme in September 1931. At that time, one had acted under the influence of fears of inflation. Now it was a question of achieving a moderate recovery of wholesale prices to the extent this was possible without substantially increasing the cost of living. "This working out of the principles for our monetary policy is

more distinct and positive than one could have hoped for in view of the need for certain compromises." However, Ohlin was not sure that the Riksbank had caught on: "The board of the Riksbank definitely belongs to the sceptics when it comes to the prospects for increasing the price level."

SocD took more or less the same position as the three economists. The bill contained no real news but was "a more distinct formulation of the guidelines given by the Riksdag last year". "The experts have now in a more positive way established that the target for an independent Swedish monetary policy ought to be a moderate increase in the domestic price level […]." If by moderate 10 to 15 per cent was hinted at "we have no objections". The paper concluded, just like Cassel, Heckscher and Wigforss, by warning against delays and urging fast action. The unity which had been arrived at, involving a conservative liberal like Cassel, a "neo-liberal" like Heckscher, a social liberal like Ohlin, a social democratic minister of finance like Wigforss and a ditto editorial writer, must be seen as rather unique.

A couple of weeks later, after the banking committee had expressed its view of the government bill, monetary policy was discussed in the Riksdag. In the second chamber, former minister of finance Hamrin cautioned that inflation is always dangerous. In the first chamber, Örne remarked that currency experts, the minister of finance and the banking committee had each presented their own programmes and that it would be a suitable task for a doctoral dissertation to sort out in what ways these programmes converged or deviated. Wigforss, however, explained that his statement was a reformulation of the statement of the experts and that the statement by the committee was a reformulation of his statement. The statement of the committee was approved in both chambers and all proposed alterations were repealed. No editorials appeared in the daily newspapers after the discussion.

THE ECONOMISTS 1933-34

Now that the course had been determined and most of the important actors had joined in, Sweden's monetary policy debate entered calmer waters. In the summer of 1933, developments on the international scene attracted interest, not least the monetary and economic world conference in London.

In a comment on the London conference, Ohlin (1933b) certified that after recent events in the United States (which had abandoned the gold standard in the spring of 1933) it was no longer possible to argue that an energetic economic policy could not bring about a price hike. Cassel (1933h), himself a delegate in London, soon concluded that the conference had stranded. The only way forward would, according to him, have been if Britain and the United States had agreed on and implemented a monetary programme. Other countries would then surely have joined in and regulated their currencies against the pound-dollar currency.

Cassel (1933i) could see no future for the gold standard in the long run. Even if the central banks of the world managed to stabilize the purchasing power of gold against goods one could question the use of pegging currencies to gold. "It is hard to see why

central banks with the same kind of measures should not be able to uphold the same stability in the purchasing power of money without using gold as medium."

The fact that gold countries did not want to discuss price increases should, according to Ohlin (1933c), not prevent other countries from doing just that. It was actually an advantage if negotiations could be limited to countries with a similar view of monetary problems. The fundamental cause of the difficulties in reaching agreement was that there were three blocs pursuing different economic policies, namely the gold countries, the sterling group and the United States. "Scandinavia is", Ohlin (1933d) noted, "more and more associated with the British empire." Ohlin (1933e) soon reported from London that the British press claimed that important monetary negotiations had been initiated between the British Empire and the Scandinavian countries. Minister of finance Wigforss, on site in London, declared that plans for forming a sterling bloc were embraced with sympathy in many countries but that the final decision rested with Britain. Concerning the sterling group cooperation, Ohlin (1933f) counted on a continuation of the present policy "that the other currencies are held in a practically stable relationship against the pound sterling".

Cassel's (1933j) final monetary reflection in the summer of 1933 was a plea to Britain to shoulder international monetary leadership and form a sterling bloc[7] with its dominions and other countries willing to join a rationally regulated pound. The first objective of such a bloc must be to bring about a limited increase in the price level of goods. The second objective would be to stabilize price levels and peg exchange rates between participating countries. In all probability the Scandinavian countries would be part of such a bloc. Cassel is, as we can see, very close to the views expressed by Ohlin a couple of weeks earlier.

The famous pegging of the krona to the pound in the summer of 1933 did not come about through any deliberate action from the government, the Riksdag or the Riksbank. It was a silent – even haphazard – connection with the pound that was to be permanent for the rest of the decade (see Jonung 1979a, p 474).

At the beginning of September, Ohlin (1933g) noted that Scandinavian currencies "have thanks to the regulation of central banks slavishly followed the pound". A month later, Cassel (1933k) noted the same thing: "As Sweden since mid-July has had a fixed rate against the pound of 19.40 and consequently has joined the sterling currency, we of course have a strong interest in the fulfilment with necessary force of the monetary programme of the British empire […]."

The fact that the monetary debate receded after the summer of 1933 becomes clear if we use bibliographies/article indexes of the three leading debaters Cassel, Heckscher and Ohlin as a measuring rod. In the spring of 1934, we only find a few contributions from Cassel and Ohlin respectively and none from Heckscher. This can reasonably be explained by the fact that Sweden's monetary policy had crystallized after two years of discussion and experiment and that the international business climate was improving.

7 A group of countries pegging their currencies against the pound sterling.

In March 1934, Ohlin (1934a) concluded that Swedish monetary policy had developed in two ways. Firstly, the Riksbank had purchased currencies and pushed down the external value of the krona at the same time as it had been holding on to a rate of 19.40 against the pound sterling. Secondly, by purchasing government bonds, gold and currencies the bank had created an "abundance of money", which had pushed down interest rates. "Compared to such purchases of government bonds and currencies – so-called open market operations – discount rate policy has been of very little importance."

In May, it was again time for the Riksdag to decide on the principles for monetary policy. In view of this, Cassel (1934) scrutinized the monetary policy pursued during the previous year. He interpreted the Riksdag decision of 1933 to mean that Sweden should join a possible increase of the British price level or – if such an increase did not occur – independently bring about a moderate increase of the domestic price level. Thereafter the krona had been fixed against the pound. The British price level had, however, been constant and consequently there had not been much room for an independent price hike in Sweden. Sweden now faced a choice. If Britain did not carry out its programme of price increases, Sweden had to consider abandoning the pegging of the pound in order to be able to carry out the domestic price increases which had been stated in the monetary programme of 1933.

Ohlin (1934b) was less inclined to see a choice approaching. He turned against sceptics who did not believe that the policy of the Riksbank had been of importance for the comparatively beneficial economic development in Sweden and he saw no reason to abandon the fixed rate against the pound. "The prospects of further economic improvement and price increases in Britain are still fairly good. A fixed position in the sterling bloc therefore still represents a natural position for the Swedish krona." There was, however, no reason to peg the krona to the pound definitely. If, for example, the price level in Britain went down the peg would have to be abandoned; otherwise the fall in prices would spread to Sweden.

THE ECONOMISTS LOOK BACK

Let us round off this chronicle with some retrospective views of the Swedish experience of its first years on the paper standard, as they were interpreted by the leading experts on monetary policy, Cassel, Heckscher, Ohlin and – in passing – Lindahl.

When, at the end of 1935, Cassel (1935) looked back at Sweden's monetary policy he concluded that the price increases had been weaker than expected when the monetary programme was worked out. This was because the krona had been pegged to the pound from the time of the London conference in the summer of 1933. He consequently hoped for the British programme of price increases to be finally carried out so that Sweden would be able to retain the pound rate and at the same time have room for domestic price increases. However, he did not want to bring the price level back to where it had been in 1929, before the onset of the great deflation. "As years go by an adaption to the lower price level takes place. This adaptation is still imperfect and this is precisely why price

increases are needed. However, these price increases can stop half-way." Half-way in this case meant 1930.

In the fall of 1936, Ohlin (1936) summarized Sweden's five years on the paper standard. The transition to the paper standard in September 1931 had been accompanied by a "monetary declaration of majority". "This is to the credit of the liberal government of the time as well as to the management of the Riksbank and their advisers among economists." Ohlin was impressed by how well the aims had been fulfilled. The cost of living index in 1936 was at the same level as in 1931. "Such price stability surpasses anything that even the greatest optimist thought possible." At the same time, the increase in wholesale prices by some ten per cent, which was needed to make business profitable, had been achieved. There had, however, been no inflationary stimulus of business. "The paper currency has indeed produced brilliant results during this five-year period."

> "The paper currency is nowadays regarded as an alternative to the gold currency not only temporarily in times of crisis but permanently. The pioneering work of educating financial opinion, which has been carried out primarily by Wicksell, Cassel and Keynes, is coming to fruition. A rejection of the antebellum gold standard does, however, not necessarily imply that a restoration of an international monetary system is hopeless. However, it seems probable that gold within such a system will play the role of servant rather than "tyrant". [---] The experience of a rational monetary policy gained during five years of a paper currency system is a precious advantage. A future monetary system will surely combine several elements of the old gold standard and the paper standard of the crisis era." (Ohlin 1936).

A few months later, Cassel (1936) also summarized five years of "rational monetary policy". He was, just like Ohlin, impressed by how well the programme of increasing wholesale prices without considerably increasing the cost of living had been fulfilled:

> "This programme has been fulfilled to the last letter and has no doubt served us very well. The firmness of the Swedish monetary system is of fundamental importance for the economic upturn we now can rejoice in and which is drawing the attention of the whole world."

Sweden's monetary policy had been supported by Britain's policy, which had followed similar guidelines, since Sweden had had a pound rate of 19.40 from the summer of 1933. The choice between a fixed pound rate and domestic price increases, which Cassel had worried about two years before, had never been brought to the fore. The need to make a choice could, however, arise once more, this time if price increases in Britain were to be too forceful.

In February 1937, Heckscher (1937a) concluded that the situation which Cassel had foreboded was at hand. England, Sweden and other countries were "experiencing a wave

of price increases without comparison since the World War". Further price increases could be expected in England due to its rearmament programme. Consequently, Heckscher (1937b) found that the pound rate had to be adjusted. Those defending the pound rate from 1933 could not find any support for their position in the official monetary programme, since "this programme does not say a word about any fixed pound rate, but on the contrary explicitly binds our monetary policy to the development of prices".

Cassel (1937a and b) also warned at the beginning of 1937 that Britain had developed "a pure inflationary economy" which could spread to Sweden and increase the cost of living and that it therefore could be necessary to cut the fixed relation to the pound. A few months later, in connection with the government monetary bill of that year, he (1937c) concluded that a choice was necessary. From mid-1936 Britain's price level had experienced "an increase without comparison in good economic times". Now there was a choice between a fixed pound rate and adherence to the Swedish programme of stabilization. Cassel of course recommended the latter alternative.

Another economist and monetary expert, Erik Lindahl, emphasized that Sweden had to make a choice between stable prices and stable exchange rates. If stable exchange rates were chosen, the monetary programme would have been abandoned – "a fatal step out into uncertainty".

This time, the politicians did not pay much consideration to the views of the economists. Wigforss thought that stable prices and stable exchange rates could be reconciled. The statement of the banking committee – which did not perceive a need to make a choice – was approved by the Riksdag "in relative peace and harmony". *GHT* once again demonstrated its disbelief in the ability to control prices in view of "inner spontaneous forces and incentives" in the world market: harvest results, gold production, speculation in goods and psychological factors (Simonsson 1937).

At this time Ohlin (1937), had reached the same conclusion as Cassel five years earlier – it seemed as if the role of gold was over: "A Martian visiting our globe would certainly find it incomprehensible that hundreds of thousands of people are digging gold out of the earth in South Africa and other places, which then to a large extent are dug down in basements in the United States to no avail."

An interesting feature of Cassel's article from 1937 is his claim that monetary policy must be made intelligible for the Swedish population, a claim the government bill on monetary policy of that year did not fulfil:

> "The vast majority of the Riksdag can from this bill only get the impression that these matters are so complicated that an ordinary mortal cannot understand them but had better leave the whole thing in the hands of "monetary authorities". Even if such an effect is not intended, it is nonetheless deplorable. Sweden's population should be able to form an opinion, at least some main features, of the meaning of monetary policy and the need for measures intended to support this policy. This is anyway a distinct democratic claim." (Cassel 1937c)

CONCLUSION: QUESTIONS AND ANSWERS

Let us finally pose some more precise questions (inspired by Berg & Jonung 1999) to the material to extract some short answers.

1. How well was the difference between a fixed exchange rate and a domestic price level target understood?

The reorientation of the leading debaters from a firm defence of the gold standard to an acceptance of a fait accompli – paper currency – was completed overnight. Economists Cassel and Heckscher could in articles already a few hours after the government decision to abandon the gold standard explain how the new price level target was meant to work. Other economists and politicians also immediately dealt with the question. Furthermore, Sweden had extensive and fairly recent (1914-24) experience of being on the paper standard. The impression one gets from the press material is that more or less all the actors immediately understood the difference between a fixed exchange rate and domestic price stability. However, opinions naturally diverged on the issue of whether it would be *possible* to uphold price stability. Most debaters initially expected that the depreciation of the krona would result in rising prices on imported goods and thus in inflation. Some actors, mainly Brisman and *GHT* but also *NDA*, *DN* and Wigforss, doubted that it would be possible to control the price level. Heckscher also had his doubts at the beginning since there are several price levels and it is not certain that a particular price index will create equilibrium in the economy when held constant. Cassel, Ohlin and Engberg on the other hand were convinced that price developments could be controlled and as it happened – depending on skill or luck – they proved to be correct.

2. How well was the difference between stabilization of the domestic price level and allowing price increases in some sub-indexes understood?

Most actors argued around different prices – wholesale or retail, the cost of living, prices on imported and domestic goods etc. – where some could be allowed to increase whereas others ought to be kept stable. Not least Heckscher's recommendation in the autumn of 1931, that an (as he and many others thought) inevitable price increase on imported goods should be counteracted through a price reduction on domestic goods, put the difference between a stable average price level and a change in a sub-index in focus in a very clear way. However, opinions once again diverged as to whether it was *possible* and *appropriate* to compensate for an increase in one sub-index by reducing another. Heckscher was supported by some social democrats but most actors gradually embraced the idea that a moderate price increase was a precondition for the recovery of business after the deflation of the preceding years.

3. To what degree was the price level one should aim for discussed and how well was the principle of price level targeting understood?

The question of which price level one should aim for was at the very centre of the debate. The initial target, stated at the time of the abandonment of the gold standard, was to "defend the internal purchasing power of the krona". Most actors soon found this target too vague. Discussions revolved around the need to allow for wholesale prices to increase whereas retail prices or the cost of living were to be kept stable. According to those who advocated price increases, the objective was to eliminate the negative effects of the preceding deflation on business, and after that to fix the price level. The focus of the discussion was whether the appropriate price level should be the one that had existed in 1929, 1930 or in September 1931. The aim of monetary policy was decided on two occasions in 1932 and 1933 and concerned a moderate increase in the domestic price level without attachment to any precise index number. However, shortly after the transition to paper currency and on the initiative of the Riksbank, a new price index had been developed in order to make it possible to follow price developments on a weekly basis and in great detail.

From the press material it is evident that, following the initial confusion after Sweden had abandoned the gold standard, a considerable unity crystallized among leading economic authorities from right to left, like Cassel, Ohlin, Wigforss and Myrdal. They were all convinced that there was room for a moderate price increase after the preceding deflation. They were surrounded by a phalanx which primarily feared deflation and one which primarily feared inflation. The former phalanx was represented by the conservative *NDA* and the laissez faire liberal *GHT* with Brisman as economic spokesman, who argued that prices which had been deflated for a couple of years were unsustainable from the perspective of business. The latter phalanx was represented by liberal *DN* and its spokesman Heckscher, who wanted to hold on to the price level of September 1931 (as least as far as domestically-produced goods were concerned), and *SocD* and its industrious editorial writer Engberg, who feared a deterioration of workers' real wages.

4. What was the opinion about who should decide the aim of monetary policy?

There was agreement – or agreement gradually became established – that the aims of monetary policy were to be decided by the government and the Riksdag and that, after that, the Riksbank should be free to choose the means to fulfil these aims. Cassel, in particular, demanded on several occasions that this procedure should be applied and in the spring of 1933 it was clear that the social democratic government had listened to this advice as minister of finance Wigforss put a bill before the Riksdag in which the principles of Sweden's monetary policy were laid down.

5. How well were the differences between separate monetary means understood?

The means discussed were the discount rate, regulation of the money supply (operations in the open market), credit restrictions, currency control, import regulation, customs duties

and wage cuts. Economists like Cassel, Heckscher and Ohlin emphasized the discount rate and money supply. Cassel and Heckscher, however, questioned the efficiency of discount rate policy and Heckscher made a reservation that a certain stock of money could have different effects on the price level due to variations in the velocity of money. Cassel, and to a certain degree Ohlin (but not Heckscher), could accept import regulation but found currency control to be the most devastating measure imaginable. Cassel and Brisman sometimes discussed wage cuts. Conservative papers recommended import regulation or customs duties, wanted to cut interest rates and wages and opposed credit restrictions. Liberal papers normally argued for low interest rates and against credit restrictions, but also against protectionist measures. Social democratic writers put their faith in the discount rate, credit restrictions and currency control but denounced everything that smacked of protectionism or wage reduction. In general, different actors understood the differences between separate means very well and argued for those they thought were most effective or best supported their position of ideology or interest.

6. Could monetary policy be understood by the general public?

Unfortunately, it is not possible to say anything substantial about how well the general public could understand monetary arguments. The fact that some newspaper debaters worried about a lack of economic literacy among the broad masses is clear from the recurring discussions on the need for economic education in schools and educational organizations for adults. A statement (by Örne) that most people do not understand economics any better than a cat understands a windmill seemed to be confirmed when a paper (*DN*) sent a reporter to find out what the man (or woman) in the street thought of the causes of the economic crisis. There was, however, among those initiated into the mysteries of monetary policy, no desire to *hide* the windmill from the cat. On the contrary. But – as *DN* once concluded – it is easier to observe an exchange rate than to observe tendencies in a huge and complex price index material.

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The Swedish market for balancing liquidity between the banks overnight 2007-2010

Johanna Eklund and Per Åsberg Sommar*

This article uses transaction data from the Riksbank's payment system RIX to study the functionality of the overnight market and to determine whether monetary policy is being implemented efficiently. The study shows that, both before and during the crisis, the overnight rate for the banks varied within the band deemed by the Riksbank to represent efficiently implemented monetary policy. At the same time, the result shows that the deviation of the overnight rate from the repo rate and the level of volatility in the overnight rate have both increased since the outbreak of the financial crisis.

In addition, the study shows that the level of activity on the overnight market was low during the financial crisis. The level of activity did not increase until October 2010, when the Riksbank's last fixed-interest rate loan with a one-year maturity fell due. However, the banks' liquidity planning seems to have changed slightly after the crisis. For example, banks that previously systematically financed large deficits on the overnight market have done this to a significantly lesser degree since October 2010.

Introduction

To explain the determination of interest rates, from the repo rate to long-term market rates, it is important to understand how the markets for loans with short maturities function. It is particularly important to study the market that the Riksbank has the greatest ability to steer, which is to say the Swedish market for balancing liquidity between the banks overnight – the overnight market.

Long-term market rates are mainly determined by expectations of future overnight rates and the risk premiums associated with each maturity. An operational framework in which the overnight rate is stable and predictable thus contributes towards stabilising the development of long-term interest rates. So that the overnight rate may provide a stable anchor for the determination of interest rates with longer maturities, the Riksbank strives to hold the overnight rate stable and close to the repo rate. The indicator that the Riksbank currently uses to assess if monetary policy is being implemented efficiently specifies that the overnight rate should not deviate by more than 10 basis points above or below the repo

* The authors work in the Financial Stability Department and the Monetary Policy Department of the Swedish Riksbank.

rate. To monitor continuously how the overnight rate is developing in comparison with the repo rate thus forms an important part of an assessment of how efficiently the Riksbank is implementing monetary policy.

Even if a stable overnight rate forms an important precondition for the efficient implementation of monetary policy, it is not the only criterion. An equally important criterion is the influence of the overnight rate on interest rates with longer maturities. Frictions or limitations that prevent the overnight rate from being reflected in long-term interest rates may be a sign of inefficiency. However, this study focuses solely on the overnight market.

To assess the functionality of the overnight market and whether monetary policy is being implemented efficiently, it is however not enough to just study pricing. It is also important to study activity on the overnight market in terms of turnover and the number of transactions. Frictions in the overnight balancing of liquidity between banks should certainly be noticeable through their effect on the overnight rate, but this gives no information on what may lie behind them. By monitoring the level of activity and the banks' behaviour on the overnight market, the Riksbank can gain a better understanding of the distribution of liquidity among the banks. This will also provide the Riksbank with an understanding of the extent to which individual banks are motivated to adopt strategies that promote their own interests at the cost of impairing the functionality of the overnight market.[1]

In this article, we use transaction data from the Riksbank's payment system RIX to assess the functionality of the overnight market and to map the overnight balancing of liquidity between the banks. We use the same data to establish measures of how efficiently monetary policy is being implemented by examining the extent to which the overnight rate on the market for balancing liquidity deviates from the repo rate. The Riksbank has not previously used transaction data in its current analysis and, consequently, a section of this article describes the data being used.[2]

This article has five sections. The first section includes a short description of the Swedish market for balancing liquidity overnight, that is to say the overnight market. Section two describes the statistics that form the basis of the study. The third section analyses the average overnight rate and its deviation from the repo rate. The fourth section includes an analysis of the microstructure of the Swedish overnight market. In this section we look at transaction volumes, turnover and the significance that the behaviour of the various participants has for the balancing of liquidity. Section five includes a concluding discussion.

1 Henckel et al. (1992) discuss the manner in which the mutual negotiating strength of the banks can influence the interest rates for overnight loans and the central bank's role in maintaining an efficient overnight market.

2 Eklund (2009) uses transaction data from the payment system RIX to analyse the Swedish overnight market. Particular focus is placed on contagion risks between the banks resulting from their mutual exposure in the form of overnight loans in Swedish kronor.

1. The market for balancing liquidity overnight and the Riksbank's policy rate

The market for balancing liquidity overnight – also known as the overnight market – is the market in which banks manage temporary surpluses and deficits in their liquidity in Swedish kronor. The need for an overnight market arises due to the payments in Swedish kronor handled by the banks every day, on their own behalf or on behalf of their customers. Payments in Swedish kronor between banks are made via transfers between their accounts in the Riksbank's payment system RIX. The Riksbank provides the means of payment in Swedish kronor and determines the conditions for deposits and borrowing by the banks in and from their accounts in RIX. This forms the core of the Riksbank's ability to steer the interest rate.[3]

The banks make forecasts of their payment flows and plan their liquidity over a longer period. However, as incoming and outgoing payments made during the day do not entirely match, there arises a surplus or deficit of liquidity that the banks must manage. During the day, those banks that are members of RIX may finance deficits through interest-free Swedish krona loans from the Riksbank, so called intra-day credit (under the condition that they provide eligible collateral). Before the payment system closes for the day, the banks' accounts in RIX must be balanced. This means that those banks having a liquidity deficit at the end of the day must somehow finance this deficit overnight. In turn, those banks with a liquidity surplus must deposit it. The banks can either even out their surplus or deficit between themselves on the overnight market via what are known as overnight loans, or they can deposit or borrow kronor from the Riksbank's standing facilities. Which of these two alternatives the banks choose depends on the relative costs of the alternatives.

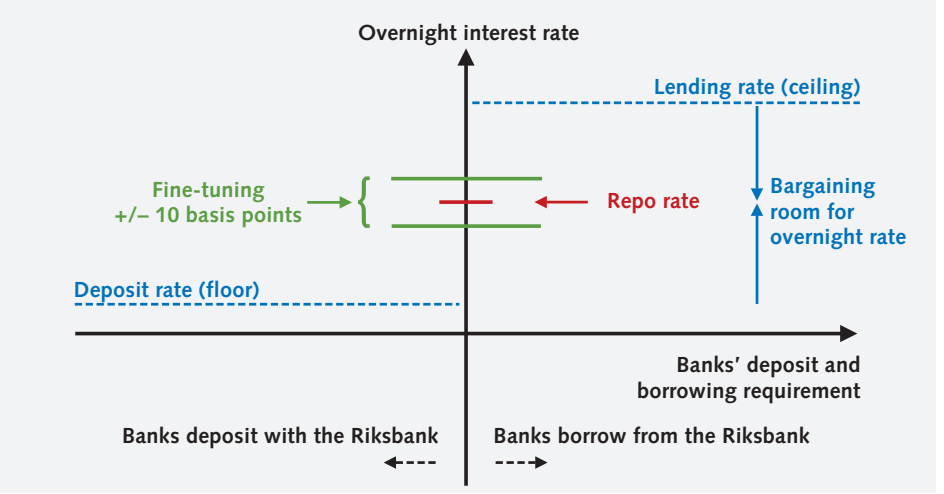
With the standing facilities the Riksbank provides an opportunity to deposit money overnight at a deposit rate corresponding to the repo rate minus 0.75 percentage points or to borrow money at a lending rate corresponding to the repo rate plus 0.75 percentage points. Banks that participate in RIX and that have agreed with the Riksbank to be monetary policy counterparties always have the possibility of borrowing or depositing liquidity overnight in the Riksbank's standing facilities. Thus, the banks never need to borrow on the overnight market at a rate above the Riksbank's lending rate or to lend on the overnight market at a rate below the Riksbank's deposit rate. In this manner, the Riksbank's deposit and lending rates create a corridor within which the overnight rate will lie.

As the Riksbank sets the rates for deposits and lending far apart in the standing facilities, the banks are encouraged to lend to and deposit with one another at an interest rate lying between the deposit and lending rates in the facilities (see Chart 1). The more precise level of the overnight rate is however a matter for negotiation between the banks on the overnight market. The difference between the deposit rate and the lending rate in the Riksbank's standing facilities, known as the interest rate corridor, is currently 150 basis

3 See Nessen et al. (2011) for a more detailed review of the Riksbank's operational framework.

points, divided symmetrically around the repo rate. This corridor can be seen as a trade-off between, on one side, a narrow corridor limiting fluctuations in the overnight interest rate and, on the other, a broad corridor motivating an active overnight market in which the banks have strong incentives to mutually even out their liquidity. Historically, the balancing of liquidity between the banks in RIX has taken place at the end of the day, with very limited use being made of the standing facilities.

Chart 1. The Riksbank's operational framework



During the financial crisis, the width of the interest rate corridor was reduced from 150 to 100 basis points as the Riksbank lowered the repo rate to 0.50 per cent in April 2009. The aim of this was to avoid having a negative deposit rate in the Riksbank's standing facilities. When the repo rate was lowered to 0.25 per cent in July 2009, the Riksbank deemed that a further narrowing of the interest rate corridor would weaken the banks' incentive to mutually even out their liquidity positions. The width of the corridor was thus held unchanged at 100 basis points. When the repo rate was raised to 0.50 per cent in July 2010, the corridor was widened to 150 basis points again. This is the historically normal width of the Riksbank's corridor, which has applied since the present operational framework was introduced in 1994. The Riksbank thus considered this widening as part of the normalisation of monetary policy.[4]

While the Riksbank's standing facilities certainly form an outer framework for the pricing of the overnight market, they are not sufficient to guarantee that the overnight rate will remain stable and close to the repo rate. If the banking system as a whole has a residual liquidity deficit vis-à-vis the Riksbank, and if the Riksbank then takes no action, the banking system will need to borrow from the Riksbank's lending facility. The interest rate on the overnight market will thus be close to the Riksbank's lending rate. Conversely, the overnight

4 See the supporting material for the repo rate decision published on 1 July 2010 http://www.riksbank.se/upload/Dokument_riksbank/Kat_publicerat/Pressmeddelanden/2010/nr30_beslutsunderlag.pdf.

rate will be close to the Riksbank's deposit rate if the banking system as a whole has a liquidity surplus. Consequently, in order to stabilise the overnight rate, the Riksbank tries to ensure that the banking system as a whole is always in balance towards the Riksbank.

In order to be able to regulate the balance of the banking system, the Riksbank makes current forecasts of the banking system's liquidity requirements over the coming week. If the banking system (as at present) has a structural surplus of liquidity towards the Riksbank, the Riksbank sells certificates to the banks to draw in this surplus liquidity. Previously, when the banking system had a liquidity deficit, the Riksbank instead carried out monetary policy repos to provide the banking system with the liquidity it needed. Both Riksbank certificates and the monetary policy repos have maturities of seven days and are implemented at a fixed interest rate corresponding with the repo rate.

The Riksbank's forecast of the banking system's liquidity requirements reflects the liquidity requirement for one week, but the banking system's actual daily liquidity position towards the Riksbank can vary from day to day. This can be due to daily variations in the banks' liquidity or to errors in the Riksbank's forecast. Furthermore, the banks can choose not to purchase Riksbank certificates or not to borrow via the monetary policy repos for a week, resulting in the banking system becoming unbalanced in relation to the Riksbank on a daily basis. The Riksbank meets any deficit or a surplus of liquidity in the banking system towards the Riksbank on any particular day through what are known as its fine-tuning operations.

In the fine-tuning operations, deposits and lending take place at an interest rate 10 basis points below or above the repo rate, respectively. The aim of these operations is to prevent variations arising in the overnight rate as a result of the deviation, on certain days, of the banking system's borrowing requirement from the Riksbank's forecast. The forecast is used as a basis by the Riksbank for its weekly repo transactions and certificate issues which the banking system is assumed to mainly use to cover its structural liquidity deficit or surplus with the Riksbank. Up to October 2008, only the Riksbank's primary monetary policy counterparties were allowed to participate in the fine-tuning operations. However, during the financial crisis, the group of banks allowed to participate was widened to include all monetary policy counterparties.[5]

In addition to a number of commercial banks, the Swedish National Debt Office also participates on the overnight market. Unlike in a number of other countries, the Swedish National Debt Office turns to the banks, rather than the central bank, to manage its daily liquidity. The Swedish National Debt Office thus acts on the overnight market under the same conditions as the banks, with the difference that it may only deposit in the Riksbank's standing facilities, and then at an interest rate of 0 per cent. The Swedish National Debt Office does not have the right to borrow from the Riksbank, as this could be considered to be monetary financing of the central government debt. This means that the Swedish

5 A primary monetary policy counterparty is a credit institution that participates in RIX. They are allowed to participate in the Riksbank's repos and to purchase Riksbank certificates, and have access to the Riksbank's credit facilities.

National Debt Office's balance in the RIX system, that is whether the Swedish National Debt Office has a lending or deposit requirement, does not affect the Riksbank's position towards the banking system.

2. Overnight data

The analysis in this article is based on transaction data from the Riksbank's payment system RIX dating from October 2007 to the end of December 2010. The analysis thus covers both the financial crisis of 2008 and 2009 as well as part of the period before the crisis. It also covers a brief period after the crisis, when the Riksbank had withdrawn the extraordinary measures adopted during the crisis, as well as when the last of the three extraordinary monetary policy fixed-rate loans with maturities of one year had matured (6 October 2010).

The average interest rate on the Swedish overnight market has been calculated using the payments in the RIX system which are registered as overnight loans, and which also have an overnight maturity – that is where a repayment of the loan is registered for the following business day and is not a transaction with the Riksbank. Whether transactions with the Swedish National Debt Office should be included in the analysis depends on which question is to be answered. If the aim is to study how efficiently monetary policy is being implemented, the Swedish National Debt Office should be included, as transactions with the Swedish National Debt Office affect the average interest rate, which forms the basis for the determination of longer-term interest rates. If, on the other hand, the aim is to study how well the overnight interbank market functions, the Swedish National Debt Office should not be included. The reason for this is that lending to the Swedish National Debt Office can be considered to be a risk-free overnight investment for the commercial banks. Consequently, transactions with the Swedish National Debt Office have been included in the analysis of the overnight rate in section 3. However, in the analysis of activity on the overnight market in section 4, the emphasis lies on transactions exclusively between the commercial banks.

In this article, particular emphasis has been placed on the analysis of how the functioning and structure of the bank's overnight balancing of liquidity changed during the financial crisis and what the consequences of this may have been for the implementation of monetary policy. Consequently, in the study, the collected transaction data has been divided into four periods:

- *Period 1:* The period prior to the collapse of the investment bank Lehman Brothers, from 5 October 2007 until and including 14 September 2008.
- *Period 2:* The period from the collapse of Lehman Brothers until the Riksbank started to issue loans in foreign currency and Swedish kronor for longer maturities, 15 September until and including 1 October 2008.
- *Period 3:* The period of the crisis during which the Riksbank's lending in foreign currency and Swedish kronor is in place, 2 October 2008 until and including 6 October 2010.

- *Period 4:* The period after the withdrawal of the extraordinary measures adopted during the crisis and the maturity of the final fixed-interest rate loan with a maturity of one year, 7 October 2010 until 31 of December 2010.

SCOPE AND RELEVANCE

The transactions included in the analysis correspond with the transactions made by the banks in the overnight market to even out any deficit or surplus of Swedish kronor arising in their accounts in the payment system RIX. These transactions are standardised deposit contracts in which the loans are made without collateral. The banks also make overnight transactions in the form of repos[6] and swaps[7]. Data reported directly by the banks to the Riksbank indicates that the overnight market in Swedish kronor for repos and swaps is not unimportant in extent and that its pricing may differ from that on the overnight deposit market. However, overnight transactions in the form of repos and swaps are not captured by the statistics.

At the same time, the analysis only includes overnight transactions made between banks that are members in RIX. However, outside RIX there exist a number of banks that balance their liquidity by taking overnight loans with their correspondent banks, who are members of RIX. These transactions and the interest rate payments they generate are not directly captured by the data in the RIX system. On the other hand, the transactions are captured indirectly by the analysis, as they affect the correspondent banks' net balances and thus the correspondent banks' overnight loan requirements.

Transactions are registered one by one in the RIX system as they are carried out. The banks themselves classify which transactions are to be defined as overnight loans on the basis of certain criteria. For each separate loan, the following information exists:

- the amount of the loan, in Swedish kronor
- the amount of the repayment, in Swedish kronor
- the names of the transaction's parties
- the time of the transaction (applicable from the start of October 2009).

The calculation of the average overnight rate is based on almost 5 700 transactions between banks, and between banks and the Swedish National Debt Office during the period 5 October 2007-31 December 2010. Tables 1 and 2 present descriptive statistics for the underlying transactions.

6 *Repo:* A financial instrument resembling a loan. The seller in the transaction transfers a security to the purchaser in the transaction. At the same time, the seller commits to buy the security back from the purchaser at a given point in time for a price determined in advance. (The term is a shortened form of *repurchase agreement*.)

7 *Swap:* A bilateral agreement to exchange a specific currency or interest rate in return for another currency or interest rate for a predetermined period, according to specific conditions.

Table 1. Turnover in Swedish kronor on the overnight market, daily average

SEK billion	PERIOD 1 2007-10-05– 2008-09-14	PERIOD 2 2008-09-15– 2008-10-01	PERIOD 3 2008-10-02– 2010-10-06	PERIOD 4 2010-10-07– 2010-12-31	PERIOD 1-4 2007-10-05– 2010-12-31
Total overnight loans	45.2	45.8	15.1	25.3	25.1
between commercial banks	*39.3*	*40.1*	*5.7*	*10.1*	*16.3*
with the Swedish National Debt Office	*5.9*	*5.7*	*9.3*	*16.1*	*8.8*
Riksbank's fine-tuning operations	0.3	0.2	109.5	11.4	68.8

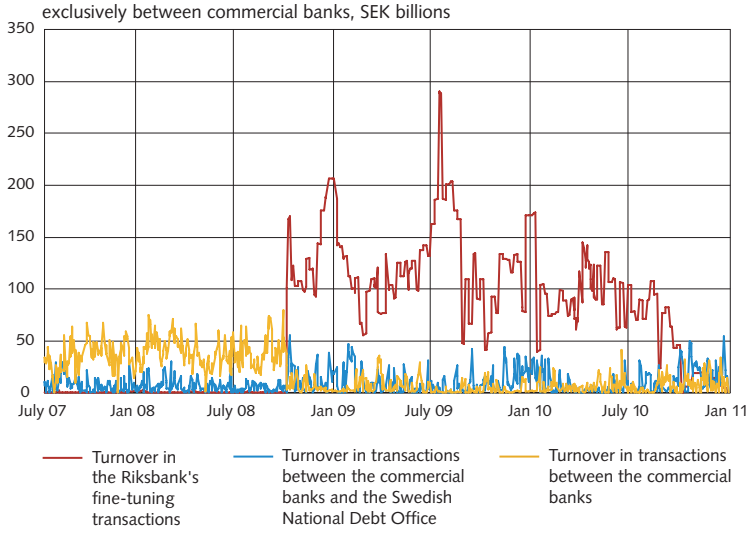
Table 2. Number of transactions on the overnight market, daily average

Number of transactions	PERIOD 1 2007-10-05– 2008-09-14	PERIOD 2 2008-09-15– 2008-10-01	PERIOD 3 2008-10-02– 2010-10-06	PERIOD 4 2010-10-07– 2010-12-31	PERIOD 1-4 2007-10-05– 2010-12-31
Total overnight loans	12.5	12.7	4.1	9.7	7.0
between commercial banks	*11.3*	*11.6*	*2.7*	*5.5*	*5.5*
with the Swedish National Debt Office	*1.2*	*1.1*	*1.4*	*4.2*	*1.5*
Riksbank's fine-tuning operations	0.7	0.6	8.2	4.1	5.6

From the tables, it can be seen that turnover and the number of transactions, both total and between commercial banks, decreased considerably during the period (see also Figure 1). The major change took place when the Riksbank implemented its first measures to strengthen liquidity during the crisis. The consequence of these measures was that the banking system as a whole, including all banks in the RIX system, received a liquidity surplus in relation to the Riksbank. Both the number of transactions between commercial banks and the value of these decreased to an average of one-third of the number and value prior to the crisis, as well as prior to the Riksbank's introduction of these measures.

With the discontinuation of the extraordinary measures and the maturation of the Riksbank's fixed-interest rate loans with maturities of one year, a large portion of the extra liquidity that existed in the banking system has been withdrawn. This has led the level of turnover and number of transactions on the overnight market to approach the pre-crisis levels. However, even after all of the extraordinary loans had matured, liquidity in the banking system vis-à-vis the Riksbank remains higher than it was before the crisis and at a surplus. The Riksbank is therefore offering Riksbank certificates with maturities of one week. However, the banking system seems to have preferred to deposit its surplus in the Riksbank's fine-tuning operations. This has reduced the banks' need to borrow from other banks overnight to even out the liquidity deficit in the payment system at the end of the day. By period four, the sum of the number of overnight loans and the Riksbank's fine-tuning operations, as well as the total turnover of these, have returned to the pre-crisis levels.

Figure 1. Turnover in Swedish kronor on the overnight market, July 2007-December 2010
Transactions with the Riksbank and Swedish National Debt Office, and transactions exclusively between commercial banks, SEK billions



3. Overnight rate

In this article, the overnight rate has been calculated as the difference between the value of the overnight loan and its repayment, divided by the value of the loan.[8] To make overnight rates comparable over time, the difference – known as the spread – between the observed overnight rate and the current repo rate has been calculated so that:

$r_{i,t} = \frac{V_{i,t+1} - V_{i,t}}{V_{i,t}} * 360$, where r_t is the interest rate calculated for each transaction, V_t is the amount of the loan *i* expressed in Swedish kronor and V_{t+1} is the amount of the repayment.

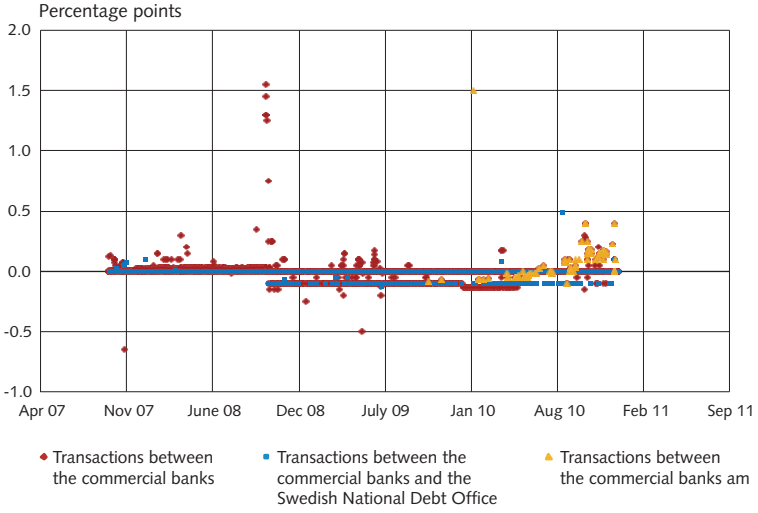
$spread_{i,t} = r_{i,t} - repo_t$

The average overnight rate for a certain day has been calculated partly as the volume-weighted average of each day's overnight rates, and partly as the arithmetical mean value. Both methods lead to the same conclusions. However, when the average interest rate is calculated as the arithmetical mean value, all overnight loans receive the same weight in the calculation. The consequence of this is that outliers have a very strong influence on the calculated overnight rate. When the overnight rate is calculated as the volume-weighted mean value, the impact of the outliers is reduced – as long as these cases concern small

8 Neither the interest rate nor the contractual maturity of the loans is specified in the data that the analysis is based upon. By matching loans and repayments between the same counterparties and of about the same amount, but with the opposite direction of flow, on the following business day, the (implied) overnight rate can be calculated.

overnight loans. The volume-weighted average is preferable because it does not require an evaluation of which outliers are to be included in the calculations, as these represent the correct values. Neither does it require an evaluation of which outliers are to be excluded on the grounds that they are incorrect. Figure 2 shows the spread against the repo rate of overnight loans during the period.

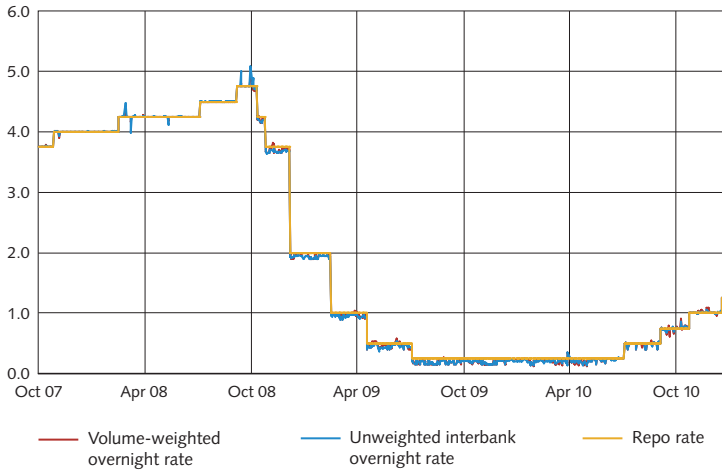
Figure 2. Spread against the repo rate for overnight loans, October 2007-December 2010
Percentage points



Note. Transactions *between commercial banks am* refers to loans between commercial banks that the banks have classified as overnight loans, with time to maturity of the next business day, but which were registered before 12.00.

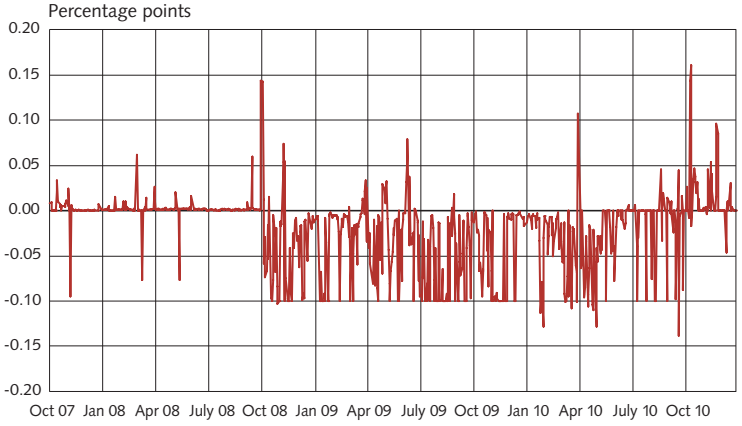
The calculation of the effective overnight rate as the volume-weighted average interest rate shows that the overnight rate lay relatively close to the repo rate over the entire period. Even so, the deviations – the spreads – against the repo rate increased slightly after the Riksbank introduced its liquidity-strengthening measures (see Figures 3 and 4). Before the crisis (period 1), the average overnight rate deviated from the repo rate by an average of 0.002 percentage points. After the introduction of the liquidity-strengthening measures (period 3), the deviation was -0.034 percentage points. After these measures were withdrawn, it became 0.016 percentage points (see Table 3).

Figure 3. Average overnight rate, unweighted and volume-weighted
Per cent



Note. The calculations include transactions between commercial banks, and between commercial banks and the Swedish National Debt Office.

Figure 4. Deviation from the repo rate of the average overnight rate, volume-weighted
Percentage points



Note. The calculations include transactions between commercial banks, and between commercial banks and the Swedish National Debt Office.

Table 3. Average repo rate and overnight rate in periods 1-4, with descriptive statistics for the deviation between the repo rate and the volume-weighted overnight rate

	PERIOD 1 2007-10-05– 2008-09-14	PERIOD 2 2008-09-15– 2008-10-01	PERIOD 3 2008-10-02– 2010-10-06	PERIOD 4 2010-10-07– 2010-12-31	PERIOD 1-4 2007-10-05– 2010-12-31
Repo rate, average (per cent)	4.19	4.75	0.90	0.93	1.92
Spread to repo rate, average					
unweighted overnight rate (percentage points)	0.003	0.024	-0.045	0.009	-0.026
volume-weighted overnight rate (percentage points)	0.002	0.006	-0.034	0.016	-0.019
Spread to repo rate (percentage points)					
Average	0.002	0.006	-0.034	0.016	-0.019
Max	0.06	0.06	0.14	0.16	0.16
Min	-0.10	0.00	-0.14	-0.05	-0.14
Standard deviation	0.01	0.02	0.04	0.04	0.04

Note. Includes transactions with the Swedish National Debt Office. If the calculations of the overnight rate are solely based on loans between the commercial banks, the deviation of the overnight rate from the repo rate is larger than it is if all loans are considered, i.e. including loans between the commercial banks and the Swedish National Debt Office. This was the case both before the crisis and after the crisis broke out. Moreover, this difference increased after the crisis broke out.

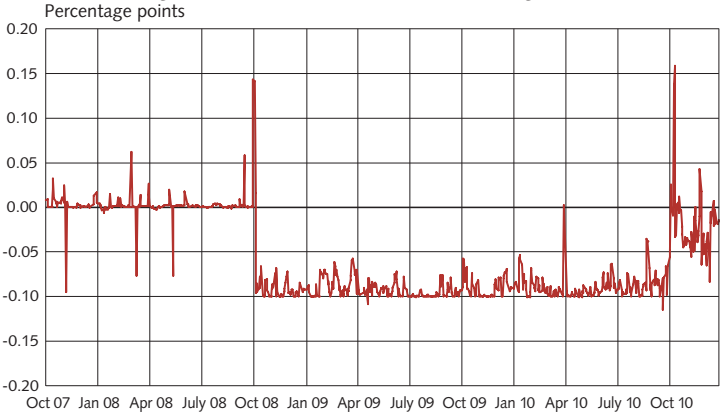
Before the crisis, the overnight rate thus only deviated marginally from the repo rate and its variance was small. This corresponds well with the idea of a gentlemen's agreement on the Swedish overnight market under which the banks even out their liquidity at the repo rate – without any spread. Such an agreement would be based on the banks' understanding that the level of credit risk in overnight lending is very low and that the administrative costs of adjusting the pricing of overnight loans to whichever bank may be counterparty in the transaction would be so high as to be unprofitable. However, such an agreement can only work under the conditions that the banks use the overnight market for the same intentions and that no bank exploits it for its own gain. Despite this, the fact that a small number of transactions every day deviate from the repo rate indicates that not all banks are party to the agreement.

Furthermore, that there is a negative average spread during period 3 (when the Riksbank's measures were in place) is a consequence of the surplus liquidity held by all banks during that period. They were able to fine-tune this liquidity with the Riksbank at the end of the day at an interest rate of 10 basis points below the repo rate. This meant that, due to its extraordinary lending, the Riksbank acted as intermediary on the overnight market during the crisis, which reduced the banks' need to mutually balance their liquidity positions.

During period 3, most banks thus only balanced their liquidity in Swedish kronor with the Riksbank in the fine-tuning operations. It can thereby be argued that the fine-tuning rate during this period was the banks' alternative cost for transactions with the shortest

maturity and that the fine-tuning rate should thus also be included when calculating the average overnight rate. With such a weighting, the average overnight rate is closer to (and more stable around) the fine-tuning rate, 10 basis points below the repo rate (see Figure 5). At the same time, it would not have been necessary to carry out any fine-tuning if the banks had chosen to deposit the "extra" liquidity in Riksbank certificates.

Figure 5. Deviation from repo rate of the average interest rate in overnight loans and fine-tuning transactions with the Riksbank, volume-weighted
Percentage points



Note. The calculations include transactions between commercial banks, and between commercial banks and the Swedish National Debt Office.

While the average spread was certainly lower during the period October-December 2010 than it was during the crisis, it was still higher than it was before the crisis. One contributory factor for this can be the uncertainty that arose in conjunction with the maturity of the third and final of the Riksbank's one-year fixed-interest rate loans. The maturity of the loan led the surplus liquidity in the banking system to largely disappear. With this, the banks were forced to balance their daily deficits and surpluses in liquidity with each other – as they had done before the crisis. This uncertainty remained for a few days. In Figure 2, the event can be seen in the form of the greater number of overnight loans made in the morning. In Figure 5, the event can be seen in the form of the increase of the spread of early overnight loans and other overnight loans at the start of October 2010.

It is worth noting that both the number of overnight loans and the total value of these transactions have decreased considerably since the Riksbank introduced its liquidity-strengthening measures. Consequently, the fact that the spread on the overnight market has not increased to any greater extent may be a consequence of the reduction of the number of transactions. The extra liquidity supplied to the banking system by the Riksbank has allowed the banks to execute their payments without having to risk a liquidity deficit that may force them to borrow from another bank at the end of the day. As the majority of the banks have chosen not to deposit their extra liquidity in Riksbank certificates, but have retained the liquidity supplied as a reserve to be deposited overnight in the fine-

tuning with the Riksbank, there has been no incentive for the banks to borrow from each another on the overnight market. However, it is a fact that the banks chose to accept the cost of retaining this liquidity as an immediately available reserve in the form of overnight deposits in fine-tuning, instead of investing it in Riksbank certificates. Consequently, one interpretation of the result is that the banks have not considered any increased risk by charging more for overnight loans, but, instead, have entirely refrained from executing these transactions when uncertainty has been considered to be too high.

THE VOLATILITY OF THE OVERNIGHT RATE

The indicator used by the Riksbank says that the overnight rate should not deviate by more than 10 basis points above or below the repo rate, so that monetary policy can be considered to have been efficiently implemented. The degree of compliance with this is captured by the deviation between the estimated average overnight rate and the repo rate. Parallel to this measure, the variance (also known as volatility) of the pricing of overnight loans also provides information on the efficiency of the overnight market. A high variance or volatility reflects a wide differentiation regarding the pricing of lending to different counterparties. The differentiation of pricing may reflect the risk associated with lending to different counterparties or a general uncertainty on the markets, but it may also reflect the negotiating strength of different banks in the pricing of overnight loans. However, an efficiently implemented monetary policy in which the overnight rate does not deviate by more than 10 basis points above or below the repo rate should be associated with low volatility.

The volatility of the overnight rate can be measured in various ways. In this article, the standard deviation of the effective overnight rate per day has been calculated as follows:

$$\text{std} = \sqrt{\sum_{i=1}^{N} (w_i \cdot x_i - \mu^*)^2}$$

x_i is the spread against the repo rate for an individual transaction i, μ^* is the volume-weighted mean value of the spread on the day in question and w_i is the amount of each transaction as a proportion of the total transaction value on the day that the transaction was executed, so that:

$$1 = \sum_{i=1}^{N} w_i$$

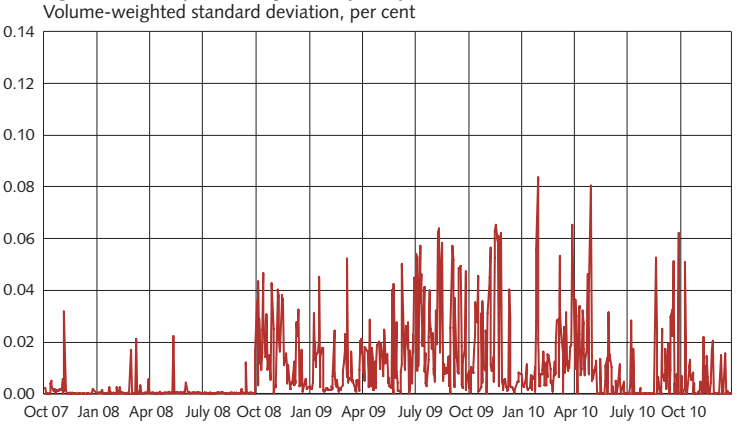
The result indicates that the volatility of the average overnight rate has increased since the financial crisis broke out (see Figure 6). However, the volatility of the overnight rate over the entire period must be considered to be low. During the period from the collapse of Lehman Brothers until the Riksbank introduced its liquidity-strengthening measures, the volatility of the average overnight rate did not increase more than marginally. Instead, the result indicates that the volatility of the overnight rate increased after the Riksbank introduced its measures.

Seen over the entire period, volatility was highest during the last six months of 2009, during a period in the spring of 2010 and during a few days in October 2010. To a certain extent, this higher volatility is probably due to the significantly lesser number of transactions taking place during these periods, compared with before the crisis. This means that a divergent interest rate in one transaction has a greater impact on the average overnight rate and in the estimated volatility.

Nevertheless, the higher level of volatility in the overnight rate coincides with periods during which uncertainty on the financial markets abroad or in Sweden was increasing. For example, the increased volatility in the spring of 2010 coincided with the increased uncertainty over Greece's fiscal problems. The increased volatility in October 2010 coincided, in turn, with the maturity of the Riksbank's third and final fixed-interest rate loan with a maturity of one year. These periods also saw an increase in interest rates and the level of volatility in interest rates with other maturities. Foremost, this was true for the *tomorrow next rate*, which is to say the interest rate applicable to loans with maturities lasting from tomorrow until the day after that.[9] Following these periods of high volatility, and after October 2010, volatility decreased again.

One interpretation of this result is that increased uncertainty on the financial markets in general is also reflected in overnight rates. Furthermore, the statistics indicate that, in conjunction with the maturity of the Riksbank's final fixed-interest rate loan, the banks have needed a period to adjust to a more "normal" level of liquidity on the overnight market, which has led to increased uncertainty and friction on the market.

Figure 6. Volatility of overnight rates per day, October 2007-December 2010
Volume-weighted standard deviation, per cent



Volatility increases slightly when transactions with the Swedish National Debt Office are excluded from the calculations. Consequently, the presence of the Swedish National Debt Office on the overnight market seems to have a certain stabilising effect on the overnight rate. As the commercial banks can regard lending to the Swedish National Debt Office as

9 The Riksbank is presently conducting a study of the tomorrow next market.

a risk-free investment, the Swedish National Debt Office's overnight borrowing from the commercial banks forms a complement to the Riksbank's standing facilities and fine-tuning.

4. Turnover and borrowing behaviour on the overnight market

TURNOVER AND VOLUME

During the period October 2007-October 2008, before the financial crisis, the average value of overnight loans amounted to SEK 45 billion per day. The average number of transactions per day was 12.5 (see Tables 1 and 2 in section 2). As turnover on the overnight market is related to turnover in the payment system in general, there exist certain seasonal variations in turnover on the overnight market – for example, turnover is lower during the summer months than during the rest of the year. Before the crisis, the Riksbank's transactions only answered for a lesser part of the turnover. During the period October 2007-October 2008, these amounted to an average of SEK 100-500 million per day. The transactions with the Riksbank are almost exclusively fine-tuning transactions. During the same period, the Swedish National Debt Office's transactions with the banks amounted to SEK 3-14 billion per day (on average, SEK 6 billion per day), corresponding to about 15 per cent of the total daily turnover. Even though unease on the financial markets was evident at the end of September 2008, due to the problems faced by the US investment bank Lehman Brothers, there was no sign of a decreased number of transactions or of decreased turnover in the Riksbank's overnight data during this period.

However, as was previously mentioned, in October 2008, the Riksbank adopted liquidity-strengthening measures, including offering loans in addition to the ordinary repos. A part of this extra lending was recovered by the Riksbank via the issuance of certificates, but the banks chose to retain the largest part of the extra lending as extra liquidity, depositing it in the Riksbank overnight. This led to the banking system as a whole receiving a comparatively large liquidity surplus with the Riksbank. Furthermore, at the end of the day, each individual bank usually had a surplus on its account in RIX. As most banks had a deposit requirement, surpluses could not be deposited with other banks. This resulted in a decrease in turnover among the banks on the overnight market, both as a proportion of total turnover on the overnight market and in absolute terms.

During the period October 2008-October 2010, turnover in overnight loans amounted to an average of about SEK 15 billion per day, just less than a third of the level of overnight loan turnover before the crisis. At the same time, the Swedish National Debt Office's share of overnight loans increased. Turnover in overnight loans between the commercial banks decreased during the period to about one-sixth of the pre-crisis level, from about SEK 39 billion per day to just less than SEK 6 billion per day. Calculated as the number of overnight loans, the total number of these decreased during the period from an average of 12.5 to 4 per day. As regards loans exclusively between commercial banks, these decreased from 11 to 2.5 (see Tables 1 and 2).

Over the end of 2009 and the start of 2010, the number of transactions and turnover on the overnight market both continued to be low. However, as from October 2010, turnover has increased again. As the total liquidity in the banking system towards the Riksbank is higher than it was before the crisis (when the banking system had a deficit towards the Riksbank), the banks' need for balancing of their liquidity positions among each other is lesser. However, compared with the period preceding the financial crisis, turnover on the overnight market continues to be lower.

BORROWING BEHAVIOUR – ACTIVITY AND NET BORROWING

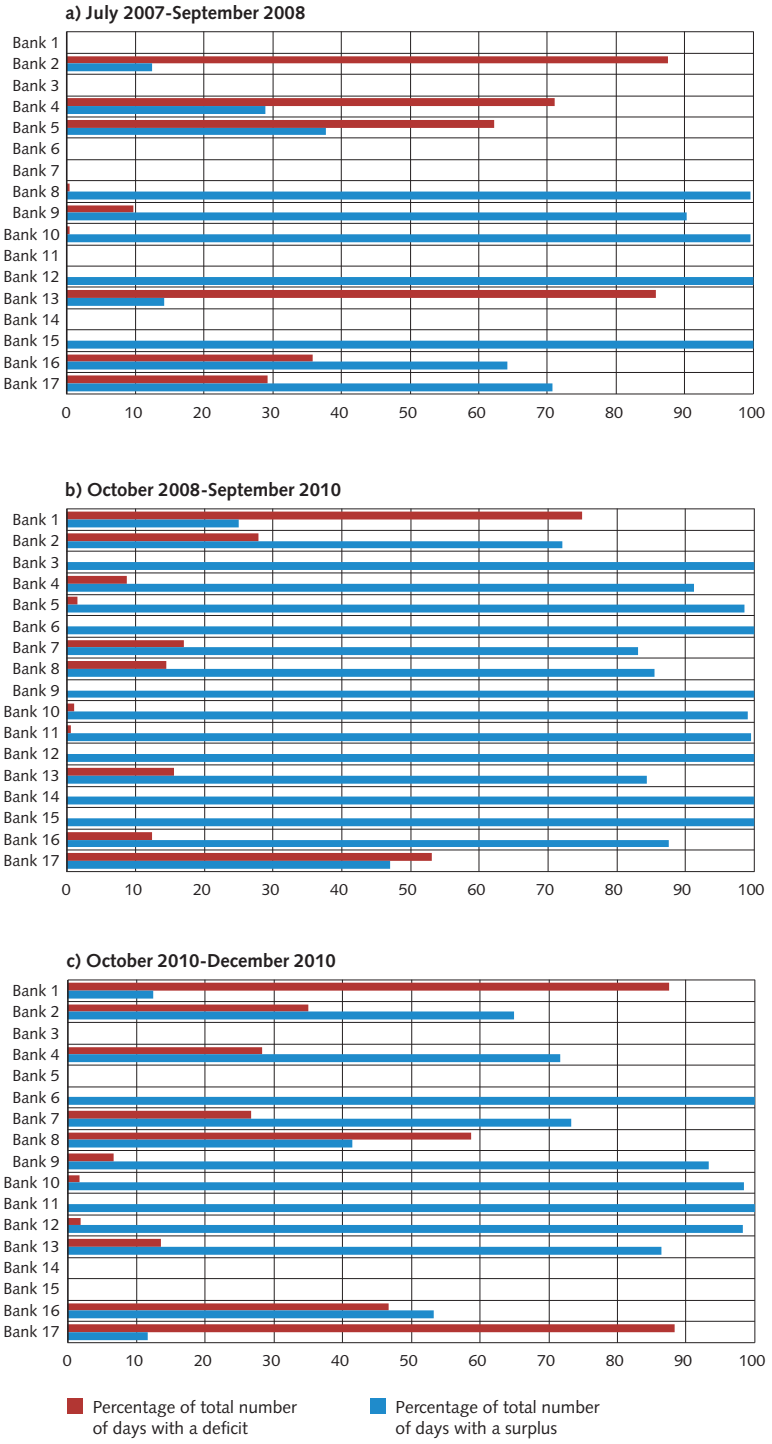
Before the financial crisis, until October 2008, there were clear differences between the banks in their borrowing behaviour on the overnight market. Many banks seem, to a very great extent, to have had a strategy of either systematically borrowing or systematically depositing liquidity overnight. Typically, those banks depositing on the overnight market were smaller banks. Also among the larger banks, there were banks which deposited liquidity on the majority of days, but this behaviour is not as clear-cut as among the smaller banks (see Figure 7a-c).

Three of the larger banks borrowed significantly more frequently than they deposited, indicating that their strategy was to fund part of their liquidity requirement in Swedish kronor on the overnight market. At the same time, the larger banks often both borrowed and deposited liquidity overnight on the same day. One possible explanation for this is that the banks' own restrictions on their exposure towards individual counterparties – counterparty limits – confine their ability to even out their entire balance with a single counterparty. Consequently, on certain days, they have been forced to resort to another bank to intermediate in the transactions in order to balance their borrowing or deposit requirements. However, this seems to have worked well, on the whole – without any bank being forced to use the Riksbank's standing facility.

During the crisis, participation on the overnight market decreased, as did the value of the transactions being executed. Banks that had previously almost exclusively been borrowers on the overnight market borrowed significantly less frequently during the financial crisis. This is probably a result of the major liquidity surplus existing in the banking system as a whole. This resulted in a reduction of the banks' incentive to balance their liquidity position with the other banks – on most days, the banks had no need to borrow from other banks and could frequently fine-tune their entire deficits directly with the Riksbank.

As activity on the overnight market increased after October 2010, it has been possible to observe changes in the banks' behaviour on the overnight market. The distinct borrowing or depositing behaviour shown by the banks before the crisis can no longer be observed to the same extent. Above all, the three major banks that consistently funded deficits on the overnight market seem to have changed strategy. Since October 2010, they have run liquidity surpluses more often than deficits (see Figure 7c). Also, the amount of the banks' balances on the days that they have had a deficit on the overnight market has been smaller during the period October-December 2010 than it was before the crisis (see Figure 8).

Figure 7. Borrowing behaviour, proportion of days that the banks borrow or deposit money overnight
Percentage of total number of days that the bank participates on the overnight market



The return to balancing liquidity between the banks has thus entailed a certain change in the structure of the Swedish overnight market. As the change in the banks' behaviour is so clear, there is reason to believe that this is something that has been consciously implemented by the banks. Apart from the larger liquidity surplus towards the Riksbank held by the banking system as a whole (compared with before the crisis), it is also likely that the seemingly increased liquidity deficit held by the Swedish National Debt Office has contributed towards facilitating a change in the banks' behaviour.

Figure 8. Average and variance of the banks' liquidity position in Swedish kronor balanced overnight, before and after the crisis
SEK billion

Note. The red and blue bars show the spread between the total amounts deposited (+) and borrowed by each bank (-) on average per day on the overnight market, before (red bars) and after (blue bars) the crisis. The upper edges of the bars represent the 90th percentile and the lower edges represent the 10th percentile of each period. The yellow rhombus marks the average value of each period, i.e. the bank's average overnight borrowing or deposit. These calculations include transactions with the Swedish National Debt Office and fine-tuning with the Riksbank. 'Before the crisis' refers to the period July 2007- September 2008: 'after the crisis' refers to the period October 2010-December 2010.

COUNTERPARTY PATTERNS

Before the financial crisis, transactions on the overnight market were largely made between the same counterparties every day. In other words, each bank had one or two banks with which it mostly conducted its overnight loans. This was partly a consequence of the fact that most banks almost always deposited funds overnight at the same time as a few almost always borrowed, which normally meant that there were very few counterparties to choose from when making deposits. In the few transactions conducted during the crisis, until October 2010, the counterparty patterns were approximately the same as they were before the crisis in the sense that the banks mostly turned to the same counterparties as previously. However, as almost all banks made fewer transactions during this period, this also resulted in each bank having fewer counterparties. In addition, data for this period indicates that above all one major bank had become a more important counterparty for

more banks, while the other major banks considerably decreased their activities on the market, in certain cases completely refraining from making transactions with other banks.

Between October 2010 and December 2010, the counterparty patterns observed were also unchanged compared with before the crisis. The banks largely use the same counterparties as before the crisis and, as a rule, also balanced with about the same number of counterparties each day as before (one to three). The possible counterparties that each individual bank may turn to at the end of the day has been affected, to some extent, by the appearance and disappearance of banks in the group of banks on the overnight market, as well as by changes in the behaviour of certain banks. However, this has not led to any clear structural changes.

One change worth noting, which primarily occurred in the autumn of 2010, is the tendency for more overnight loans to be taken out during the morning, occasionally before the markets open for the day (see Figure 2). One possible explanation could be that uncertainty related to the crisis has made the banks more cautious, with the result that they want to secure their liquidity requirements in the mornings when they expect there to be large outflows of liquidity and the risk of facing a large deficit at the end of the day. If so, the interpretation of this is that certain banks have chosen to act early in the day so as to avoid the risk of finding themselves in a tight spot just before the market closes. This may also have affected the choice of counterparty and may also provide an explanation for the changed borrowing behaviour of certain banks.

5. Concluding remarks

Using transaction data from the Riksbank's payment system RIX, it is possible to follow, on an ongoing basis, the pricing and activity levels on the overnight market for loans between the banks. This contributes to improving the Riksbank's perception of how efficiently monetary policy is being implemented. The study shows that, for the period October 2007-December 2010, the average interest rate on the overnight market varied within the band deemed by the Riksbank to represent efficiently implemented monetary policy. Nevertheless, both the deviation of the overnight rate from the repo rate and the level of volatility of the overnight rate have increased since the financial crisis broke out. This indicates that the pricing of overnight loans has been affected, to a greater extent than previously, by the uncertainty prevailing on the financial markets in both Sweden and globally. This may be due to increased uncertainty abroad, to the greater adjustment to prevailing factors of the pricing of overnight loans by the banks, or to a combination of these.

With the adoption of liquidity-strengthening measures by the Riksbank in October 2008, the overnight market changed. As a result, the banking system's liquidity position towards the Riksbank turned to a large surplus, which led to almost all banks being able to retain a surplus in the RIX system during the day. In addition, the need for end-of-the-day balancing with other banks decreased, as did the opportunities for this. Activity

on the overnight market decreased markedly during the crisis, in terms of both turnover volumes and the number of transactions for overnight loans. During the period October 2008-October 2010, turnover in overnight loans between commercial banks decreased to about one sixth of its pre-crisis level, while, at the same time, the number of overnight loans decreased to about one quarter.

During late 2009 and early 2010, the number of transactions and level of turnover on the overnight market continued to be lower than before the crisis. However, as from October 2010, turnover in transactions between commercial banks has increased again. As the total liquidity of the banking system towards the Riksbank is higher than it was before the crisis (when the banking system had a deficit towards the Riksbank), the banks' need for mutual balancing has, in some sense, decreased – some of the banks with a surplus can always deposit, at least part of it, in the Riksbank's fine-tuning operations. However, compared with before the financial crisis, turnover on the overnight market continues to be lower.

At the same time, the statistics indicate that the banks have changed their behaviour to a certain extent, as compared with before the crisis. Firstly, there are signs that, since October 2010, the banks have abandoned the borrowing or deposit strategies that were observed before the crisis, and that the amount of the banks' net balances was generally smaller during the period October-December 2010 than it was before the crisis. Secondly, there are certain indications that the banks more frequently than before act earlier in the day – taking out overnight loans during the morning, so as to avoid the risk of finding themselves in a difficult situation just before the market closes. One possible explanation to the observed changed behaviour is that uncertainty connected with the crisis has made the banks more cautious.

So far, the overnight rate has remained within the accepted band of 10 basis points above or below the repo rate, which indicates that monetary policy has been efficiently implemented. However, for monetary policy to be considered efficient, the way that the overnight rate is reflected in interest rates with longer maturities is equally important as having an overnight rate that is stable and close to the repo rate. One condition for the Riksbank to be able to affect longer-term market interest rates in a predictable manner is that the banks can expect to borrow or deposit the surpluses and deficits arising over the day on the overnight market at an interest rate close to the repo rate. During the financial crisis, turnover on the overnight market decreased. This indicates that any uncertainty on the interbank markets has reduced activity, rather than affected pricing. Narrow limits or other restrictions affect the banks' ability to utilise the overnight market for managing their liquidity. In turn, this has repercussions on the setting of interest rates for markets with longer durations and contributes towards reducing the efficiency of a monetary policy that is focused on steering the overnight rate. At the same time, restrictions such as, for example, limits between the banks can contribute to more disciplined liquidity management, which is positive from the perspective of financial stability.

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Sveriges Riksbank
SE-103 37 Stockholm

www.riksbank.se
Tel +46 8 787 00 00
Fax +46 8 21 05 31