

■ On central bank efficiency

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What is central bank efficiency and how can it be measured? In this paper we discuss the issues that make central bank efficiency more difficult to define and analyse than economists' standard notions of firm efficiency. Much of the material draws on a recent workshop on this topic organized by the Riksbank.¹ But rather than presenting a comprehensive summary of the workshop, we focus primarily on the policy conclusions that we believe emerge.

The authors have benefited from comments from Nicoletta Batini, Staffan Viotti and Anders Vredin.

Central banking has certain features that make it quite different from the operations of private firms. Central banks tend to have a combination of somewhat vague objectives and soft budget constraints, whilst not being subject to market forces in the usual way. And while vague objectives is something that many public institutions have in common, the soft budget constraint is particularly obvious in central banking. For private firms in a competitive environment, the profit motive may guide decisions about which products and services to render while at the same time serving to impose cost efficiency. For them, bad decisions may lead to low profits, risk of takeover or bankruptcy. But such market forces are largely absent from considerations about what the purview of central banks should be and how their goals should be attained with cost efficiency.

Central banks tend to have a combination of somewhat vague objectives and soft budget constraints, whilst not being subject to market forces in the usual way.

Another feature of central banking is the tendency to have several goals, in contrast to the single goal of profit maximization that is usually assumed for private firms. While some goals are easy to measure, others do not readily lend themselves to quantification. Thus, the normal pressures for efficiency do not apply directly to central banks. While it is true that the need to attain and to keep legitimacy does exert pressure for efficiency, it cannot quite match the knife-edge competition from market forces.

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¹ On May 23–24 2003 the Riksbank organized a workshop on Central Bank Efficiency; the purpose was to bring together academic economists as well as economists involved in policy-making for an exchange of views and also to promote research in this area. Most of the papers that were presented are available at the Riksbank website www.riksbank.com/conferences/efficiency and referenced in this article.

A concept of central bank efficiency involves considerations of what the appropriate services are as well as how they can be produced at least cost.

We believe it is uncontroversial that a concept of central bank efficiency involves considerations of *what* the appropriate services are as well as how they can be produced at *least cost*. It resembles the standard economic concept of efficiency, which envisions that resources are used to produce goods and services that people actually want and that this is done in ways that are not technically wasteful. But the scope of a central bank's tasks is far from uncontroversial, an issue we discuss more below.

The rest of this paper is organized as follows. In the next section we discuss what the tasks of central banks should be. Thereafter we discuss measurement issues and the final section concludes.

What should be the tasks of central banks?

Assigning too many tasks to one institution has detrimental consequences in terms of unclear focus and inefficient management.

Many tasks that central banks perform have evolved more or less by historical accident, which partly explains the observed disparity of these tasks. There is, however, a growing awareness that assigning too many tasks to one institution has detrimental consequences in terms of unclear focus and inefficient management. This can be compared with the reactions to the negative outcomes of the corporate sector's conglomerate wave in the 70s. Today in both the public and the corporate sector there is much emphasis on focusing on core business.

A crucial first step for central bank efficiency is to establish what a central bank's core tasks should be.

We believe that a crucial first step for central bank efficiency is to establish what a central bank's core tasks should be. Although it is commonly considered that a concentration on core activities is a prerequisite for good performance, there is no consensus on central banking's core activities. In part this reflects the evolution of policy institutions in different environments with different challenges. But it also indicates that what a central bank should do *is not* self-evident.

Green (2003), for example, takes a broad historical approach to this issue and argues that the core tasks should be: 1) Providing fiscal services to the government, i.e. being the government's bank; 2) Managing the public debt in ways that maintain the confidence of the public; 3) Issuing short-term credit to facilitate the settlement of interbank claims; 4) Providing lender of last resort functions to banks in a crisis. In addition, he argues that two additional tasks may be considered as core tasks: 5) Providing a nominal anchor to the value of money or its rate of return; 6) Dampening business cycle fluctuations.

We would like to take a different approach to what should be the core tasks of a central bank, namely to consider the problem from scratch. Thus, take as starting point the economic environment in which the cen-

tral bank operates and be concrete about the market failures – or externalities – that the creation of a central bank is supposed to solve.²

Virtually all economists would probably agree that there is a need for central bank money which can function as a generally accepted medium of account as well as a medium of exchange. But there is also a wider role for central banks in promoting an efficient payment system. The payment system is one of the things that are often taken for granted in a market economy, such as the rule of law in the enforcement of contracts and public safety. Without such basic functions, market economies would grind to a halt. Alas, private institutions do not have the incentives to perform these functions in a market economy. We therefore argue that the overriding objective for central banks should be *payment systems efficiency*, as discussed in Santomero, Viotti & Vredin (2001).

What does payment systems efficiency imply for core activities? Maintaining price stability and financial stability should clearly be core tasks of the central bank; without stable prices, the payment system cannot work efficiently and without a stable financial system, payments and transactions may be severely impeded, let alone be efficient. To establish operational goals, however, it is useful to turn to hard-learned lessons of economic history. The huge cost of high inflation has led many central banks to adopt an inflation target. The high inflation episodes during parts of the 1970s and 80s ultimately led to high unemployment and sluggish growth in many parts of the world for no apparent gain. Similarly, the numerous financial crises around the world have led many central banks to keep a watchful eye on the situation in the financial system.

However, central banks are involved in many more activities, of which some, we contend, are not core tasks. The extent of this involvement should be a subject for open discussion and debate rather than sticking to entrenched positions. As noted above, some tasks may have arisen more by historical accident than design and then remained in the central bank domain without ever being questioned. There could be a case for being involved in a task not usually considered core if *economies of scope* are considered to exist between different activities, that is, if being involved in the activity may enhance one's ability in another that is seen to be a core task. An example is the "hands on" experience gained from being active in the financial markets, thereby acquiring knowledge and credibility. However, there is a risk that economies of scope are used to motivate all sorts of non-core activities, particularly since they are virtually impossible to measure.

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² This approach was suggested by Staffan Viotti in his discussion of Green's paper cited above.

Additional tasks should not impinge on the core tasks.

Another important step towards increased efficiency is thus to establish criteria for whether or not an additional task should be undertaken. One such criterion, suggested by Edward Green (cited above), is that the question of undertaking additional tasks should pass the litmus test of not impinging on the core tasks. The overall goal of payment systems efficiency may then be used to distinguish suitable core activities from additional tasks.

Being involved in many non-core activities is a problem for managerial efficiency and competence.

Being involved in many non-core activities is also a problem in terms of managerial efficiency and competence. For example, the Riksbank used to run a paper mill for the production of notes. This is an industrial operation for which the people appointed to the executive board tend not to have the strongest comparative advantage. Board members often have experience of forecasting, economic policy or banking – not of logistical and manufacturing operations. In the overall picture, such operations tend to get *too little* attention in the central bank; delegating them to a separate company can ensure that they get the attention they deserve from management and the necessary focus for operational efficiency. Besides being good for the central bank, enabling it to concentrate scarce managerial resources on core tasks, this gives the delegated activities a better chance of flourishing.

WELL-DEFINED OBJECTIVES AND OPERATIONAL INDEPENDENCE

Vague objectives make it difficult to hold the central bank accountable.

Goals for central banks are usually stated in quite general terms, like “maintaining price stability” and “promoting an efficient payment system”. But vague objectives make it difficult to hold the central bank accountable and both research and practical experience have shown that accountability is important for efficiency. Together with soft budget constraints, this means that the incentives for efficiency are small. Thus it is desirable, whenever possible, to specify the objectives more precisely.

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In this vein, several central banks have quantified the overall objective of price stability into an operational target for inflation. In the area of monetary policy, which lends itself to quantification, there has been a general move towards more measurement and transparency. In areas where measurement is less easy, central banks can use benchmarking against so called *best practice* and sometimes external reviews by inde-

³ External reviews have been made, for example, of the Bank of England, see Kohn (2000), Pagan (2003) and the Bank of England's response (2000, 2003); of the Reserve Bank of New Zealand, see Svensson (2001) and the response by the Ministry of Finance; of Norges Bank, see Svensson et al. (2002) and Longworth & Rødseth (2003); and of the Riksbank, see Leeper (2003) in this issue. See Fracasso et al. (2003) for an external review of several inflation-targeting central banks and see Sims (2003) for an appraisal of central banks' modelling strategies.

pendent economists or academics.³ Here we believe there is scope for more work, an issue we return to below.

TRANSPARENCY AND ACCOUNTABILITY IMPORTANT FOR EFFICIENCY

Increased independence accentuates the need for transparency and accountability to achieve trust. To keep its legitimacy the central bank has to explain its actions and gain the public's trust both by its arguments and forecasts *ex ante* and by achieving its goals *ex post*. Without this trust, monetary policy – and policy signalling in the form of statements about the probable future direction of the steering rate – is likely to be less effective in influencing expectations, so that ultimately the goal of price stability becomes harder to achieve with a given policy action. It is also more difficult for the central bank to act as a stabilizer of the financial system. Thus, in both areas the efficiency and credibility of policy are crucially dependent on the central bank's perceived transparency and legitimacy.

Transparency is also important in that it facilitates external evaluations of the central bank's operations in the light of the relevant information. This type of evaluation will normally aid in enhancing efficiency. For example, the Riksbank's overall activities are regularly evaluated by the Parliamentary Auditors.⁴

Finally, transparency stimulates improvements to a central bank's internal analysis and decision-making processes. When vital arguments made internally have to be explained externally, the staff is under pressure to provide the executive board with high-grade analyses and the board is held accountable for how well the policies fulfil the central bank's goals. For example, the Riksbank's assessment of inflation prospects is published four times a year in the Inflation Report; and monetary policy is motivated in the minutes of the monetary policy meetings. These published materials help others to evaluate the Riksbank. In particular, they aid the Swedish parliament in its bi-annual evaluation of Sveriges Riksbank. Also, a transparent organisation can communicate more freely and precisely with the outside world, including the academic community. In effect, transparency can thus serve as a substitute device for enhancing efficiency in the absence of direct competition.

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⁴ They recently performed a comprehensive audit of the Riksbank's operations in which they highlighted a number of areas where costs appear to have increased more than expected.

How to measure central bank efficiency

A central bank's *costs* are relatively easy to measure if one has that ambition. Relevant items include staff numbers, salary levels and the number of central bank branches. But a central bank's *outputs* do not all lend themselves to quantitative measurement. One way of measuring efficiency is therefore to assess whether central banks perform the tasks assigned to them in a satisfactory way. In other words, do central banks deliver?

EFFICIENCY IN MONETARY POLICY

For monetary policy, many issues and trade-offs are well documented.

Although there is no universally accepted way of measuring efficiency in monetary policy, this is probably an area where more research has been done than for other central bank tasks. Many issues and trade-offs are well documented, such as that between output and inflation stabilisation. It is also fair to say that policymakers have taken much note of academic findings, both in the design of institutional frameworks and in the formulation of monetary policy goals. Although it is an area that is comparatively well understood, important questions remain unanswered.

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For one thing, the lack of a universally accepted way of measuring efficiency in monetary policy has prompted central banks to consider several measures. Many of these measures tend to be outside the purview of the models that are popular in the academic literature.⁵ One, albeit rather crude, measure of monetary policy efficiency is the closeness of inflation outcomes to the target. Also considered is closeness to target of various measures of underlying inflation, an exercise which can provide information about the shocks that have occurred in the economy. Indicators of core (or underlying) inflation have been constructed that exclude certain CPI components. The Bank of Canada⁶, Sveriges Riksbank and many other central banks also use different rules, such as Taylor rules, for comparisons with actual policy as an aid to thinking about alternative paths – and thereby perhaps also provide insights into efficiency. For example, this exercise may shed some light on whether or not target fulfilment was partly a matter of *luck* rather than *design*.⁷ Also common is benchmarking of forecasts against other forecasters, in particular against the consensus mean.

⁵ One strand of literature specifies monetary policy trade-offs (i.e. policy efficiency) by specifying a quadratic loss function for the trade-off between output and inflation stabilization, see for example the overview in Svensson (2001) and Svensson et al. (2003).

⁶ See Longworth & Cosier (2003).

⁷ Blix, Dillén & Sterte-Knudsen (2003) have found evidence that the information available at the time of the forecast appeared to be efficiently incorporated into the Riksbank's forecasts using simple statistical criteria, but that the speed of revision appeared too slow in that the forecast errors are persistent over time. They also found smaller inflation target deviations over time. They suggested that the assumption of a constant repo rate in the Riksbank forecast is problematic.

When it comes to efficiency in payment systems and financial stability policy, there may be a paradox in that the easier it is to apply efficiency measurement methods, the more natural it becomes to leave those tasks to the market (maybe with the central bank retaining some supervisory tasks).

In the area of payment systems operations and the pricing of various payment instruments, efficiency is relatively easy to study.⁸ But it does not seem to be clear *why* central banks should be directly involved in this area in the first place. For example, why should central banks be operationally responsible for the clearing and settlement of large-value payments or why should they be directly involved in the business of clearing cheques? Perhaps an efficient payment system policy would call for the outsourcing of these activities? In financial stability policy, on the other hand, measuring efficiency is very difficult. Here, however, there are *externalities* and *information problems* that clearly motivate central bank involvement. We believe this illustrates that the core tasks may be primarily those where measurement is harder and efficiency potentially more problematic.

One particular problem concerns the measurement of risks in the payment system. This has implications for efficiency in terms of the trade-off between risk and return. For the individual firm or investor there is clearly such a trade-off. The same applies to a central bank but it is less clear what is optimal for society: a policy that ensures a low risk and is therefore “safe” may be considerably more costly in normal times and hence seemingly cost-inefficient; on the other hand, should a crisis occur, the costs for society may be quite large.

Two different examples from a less abstract setting can be used to illustrate this point.⁹ It may seem inefficient to have a large number of policemen patrolling the highways when speeds generally are moderate, but if the policemen were to be removed, driving behaviour would probably change dramatically; similarly, the presence of airport firefighting capabilities – that are almost never used – may seem inefficient, but may provide crucial succour in an emergency.

The dilemma, however, is that this kind of argument can be used to justify any sort of redundancy. Just as with economies of scope, it is hard to know where to draw the line. Work on measuring the efficiency of

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⁸ In the area of efficient pricing of various payment instruments, Humphrey et al. (2003) show quite a large potential for enhancing efficiency. An electronic payment is shown to cost between one-half and two-thirds less than its paper-based alternatives. This difference can be translated into a gain corresponding to *more than 1 per cent of GDP* annually from switching from all paper to all electronic payments.

⁹ These examples come from participants in the Riksbank workshop.

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financial stability policy in the broader sense is almost non-existent. Very little seems to have been done on the evaluation of policy work, such as financial stability analysis, financial regulation and supervision. Considering the quickly growing involvement of central banks (and supervisory authorities) in this policy field, that should be a matter of concern. We believe it is important that this area receives more research attention, hopefully leading to a better foundation for policymakers to act on.¹⁰

OPERATIONAL EFFICIENCY AND BENCHMARKING

There are difficulties in defining the appropriate outputs and it is often easier for central banks to talk about tasks rather than outputs.

How can the operational efficiency of central banks be measured? Are the methods applied to private financial institutions appropriate? These issues are addressed by for example Mester (2003). The literature on efficiency in financial institutions often starts from the minimisation of cost functions, inspired by microeconomic principles, to discuss such issues as scale economies, scope economies and X-efficiency in transforming inputs into outputs. However, the uniqueness of some central banking activities makes a mechanical application of this approach problematic. There are difficulties in defining the appropriate *outputs* and central banks pursue complex multiple objectives. It is often easier for central banks to talk about *tasks* rather than *outputs*, as what is rendered is in essence a type of service that leads to a stable economic environment.

Some formal, preferably quantitative measures of output are needed in order to analyse operational efficiency.

Nevertheless, some formal, preferably quantitative measures of output are needed in order to analyse operational efficiency. In this area, central banks can do much more than at present.¹¹ For example, central banks perform some tasks that are also carried out by other institutions with which comparisons could be made in the search for efficiency. This applies to such diverse activities as administrative work and academic research.¹² For activities that in principle could be outsourced, comparisons could be made with bids from external suppliers. Concerning tasks that only central banks perform, e.g. monetary policy, comparisons between central banks can provide useful benchmarks for improvements in efficiency.

¹⁰ Boot (2003) discusses the challenges the EMU countries face in developing a regulatory system that efficiently sustains financial stability.

¹¹ At the Riksbank workshop, Sandra Pianalto, President of the Federal Reserve Bank of Cleveland, discussed how cost competition and efficiency had evolved at the Cleveland Federal Reserve. They introduced so-called balanced score cards, which can be used to weigh together different categories into a one-dimensional measure. These improved Cleveland's position to be at the top in this regard. It was emphasised, however, that managers have to be careful when interpreting such results and be mindful of the factors underlying them.

¹² Some previous attempts in benchmarking research activities in Europe have come to the conclusion that "small is beautiful", i.e. smaller central banks are better at research than larger ones. Jondeau & Pagés (2003), however, argue that the evidence is split and does not support this notion directly. They find that some smaller central banks have a significant number of publications in the high-quality journals, while some of the larger ones have many publications in more middle level or national journals.

Policy conclusions

Central banks should concentrate on core activities and strive for efficiency in those. Moreover, a central bank should continually think hard about what the core activities are. Often this involves a political process with many vested interests attempting to sway the outcome. Steering the right course under such circumstances is an important task for the central bank and for the political authorities, as the economic gains to society may be considerable.

As regards measurement and attainment of efficiency, a number of complementary approaches are needed. A common procedure is benchmarking against *best practice*. This involves using tools such as balanced score cards, publishing forecasts and analyses, employing external evaluation by independent economists or political institutions such as the parliament. These have been found useful in evaluating core activities and preparing the way for measurement towards increased efficiency.

There may be arguments for being involved in non-core activities based on the notion of economies of scope, but we are fairly sceptical about this and believe these non-core activities should be scrutinized and weighed against the risk that assigning too many tasks to one institution leads to a lack of focus and inefficient management.

Central banks can do much more than at present to measure policy efficiency, at least in the fields of monetary policy and payment systems policy. More external reviews, for example by parliament or independent academics, would also be desirable to create and maintain pressure for efficiency. The implementation of inflation targeting certainly facilitates policy evaluations, and measuring the efficiency of the payment system is relatively easy. In the areas of financial stability, supervision and regulation, efficiency is much harder to measure. Even in this area, however, it is possible to identify certain obstacles to efficiency that need to be dealt with.

We believe that it is important for central banks continually to pose questions about objectives and cost minimisation, focusing on core activities and striving to perform them efficiently. Just as economic growth is predicated on discontinuing outdated methods, improving current methods and inventing new ones, the search for central bank efficiency must also be an ongoing process.

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Non-core activities should be scrutinized and weighed against the risk that assigning too many tasks to one institution leads to a lack of focus and inefficient management.

Central banks can do much more to measure policy efficiency.

It is important for central banks continually to pose questions about objectives and cost minimisation.

Appendix:

Workshop on Central Bank Efficiency
Stockholm, 23–24 May 2003
Sveriges Riksbank

Programme

Friday, 23 May

Opening address by Lars Heikensten (Governor, Sveriges Riksbank):
How to promote and measure central bank efficiency

First Session: What should be the tasks of central banks?

Chair: Lars Hörngren (Swedish National Debt Office)

Edward Green (Federal Reserve Bank of Chicago):

What tasks should central banks be asked to perform?

Discussion by Staffan Viotti (Sveriges Riksbank)

Second Session: Efficiency in monetary policy

Chair: Claes Berg (Sveriges Riksbank)

David Longworth and Janet Cosier (Bank of Canada):

Efficiency in monetary policy – some approaches at the Bank of Canada

Mårten Blix (Sveriges Riksbank):

An empirical evaluation of inflation forecast based monetary policy

Discussion by Lars Svensson (Princeton University)

Third Session: Efficiency in payment system policy

Chair: Martin Andersson (Sveriges Riksbank)

David Humphrey (Florida State University): *Payment system efficiency*

Gabriela Guibourg and Björn Segendorff (Sveriges Riksbank):

Efficiency in the Swedish retail payment system

Mats Bergman (Uppsala University):

Payment system efficiency and pro-competitive regulation

Discussion by Ed Stevens (Federal Reserve Bank of Cleveland)

Fourth Session: Problems in applying efficiency measures to central banks

Chair: Tor Jacobson (Sveriges Riksbank)

Loretta Mester (Federal Reserve Bank of Philadelphia)

Sigbjörn Atle Berg (Norges Bank)

Erik Mellander (IFAU)

Saturday 24 May

Fifth Session: Efficient organization

Chair: Lars Nyberg (Sveriges Riksbank)

Éric Jondeau and Henri Pagès (Banque de France):

Benchmarking research in European central banks

Sandra Pianalto (Federal Reserve Bank of Cleveland):

Efficient organization: Lessons from the FED system

Arnoud Boot (University of Amsterdam):

How to divide responsibilities in sustaining financial stability:

Lessons from EMU

Sixth Session: Panel discussion

Chair: Anders Vredin (Sveriges Riksbank)

Edward Green (Federal Reserve Bank of Chicago)

Arnoud Boot (University of Amsterdam)

Klaus Gressenbauer (ECB)

Nigel Jenkinson (Bank of England)

Elmar Koch (BIS)

Iftekhhar Hasan (Rensselaer Polytechnic Institute)

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