

External Review of the Riksbank Research Division

Conducted by

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1. Executive Summary

Since its establishment a decade ago, the Research Division (RD) has succeeded in its primary mission to identify advances in the theory and practice of central bank policy around the world, and to employ these ideas to improve the models and tools used to implement monetary policy in Sweden. The RD has succeeded by (1) giving researchers the freedom to devote the bulk of their time to research for publication in international academic journals and by (2) positioning and motivating researchers to use their expertise to improve monetary policy in practice by involving them in the policy process.

Our Review consists of an assessment of the quantity and quality of published research and the extent to which the Riksbank has exploited efficiently the expertise of the RD to improve policy. We identify challenges faced by the RD in continuing to harness research for the benefit of policy, and we offer a series of recommendations to sustain high-quality research output and enhance the RD's contribution to policymaking at the Riksbank.

A. General Assessment of Research

- The RD has acquired a strong external reputation for high quality and central banking-relevant research
- The Riksbank is regarded as the global leader in developing open-economy DSGE models for monetary policy analysis
- The RD's research spans many other areas of economics, finance, and statistics

B. Quantity and Quality of Published Research

- On the basis of a variety of metrics, we find that the RD has been meeting, or nearly meeting, an appropriately targeted quantity and quality of published research output
- All RD senior researchers continue to be active
- The quantitative expectations set by RD management for research output do not appear to have skewed output away from the highest quality journals
- The "pipeline" of working papers and work in progress looks strong
- Researchers participate widely in conferences abroad as presenters and discussants
- Based on Google, the division's aggregate citation count is adequate for the size and the age-distribution of its researchers
- Researchers are invited extensively to referee papers for publication in the best international journals

C. Institutional Value of Research

- The vast majority of research produced by the RD is directly related to the mission of the Riksbank

- The development and integration in the policy process of “Ramses”—an open-economy DSGE model of the Swedish economy—set the trend for research support of monetary policy in small open economies around the world
- The RD is leveraging its leading role in such research by working to expand its DSGE model to include a financial sector
- Work on monetary policy, financial markets, and statistical methods has positioned researchers to provide “creative input” to pressing policy problems
- Researchers provide direct ad hoc policy support through participation in policy meetings, by “consulting” with other divisions and departments, and by participating in preparatory meetings for the *Financial Stability Report*
- The RD contributes effectively to the policy mission of the Riksbank through its policy publications on inflation targeting and the Ramses model in particular, and in essays such as those for *Economic Commentaries*

D. The Research Environment

- The 10 workshops with international participation organized by the RD alone or in collaboration with other departments in the Riksbank have served well to integrate RD staff into the world community of academic economists and central bank researchers
- Computer resources and travel budgets are adequate
- A major shortcoming of the research environment is a severe lack of research assistants relative to other central bank research departments
- The RD would benefit from a regular group of visiting scholars to mentor researchers and help researchers to develop ideas into publishable papers

E. Challenges, Opportunities, and Recommendations

The sustainability of the RD’s capacity to produce high-quality research and to harness research to improve policy cannot be taken for granted. Beyond the shortcomings mentioned directly above, the main challenges involve 1) integration into the policy process, 2) leveraging research on financial stability, and 3) recruitment and career development. These challenges come with opportunities to improve the effectiveness of the RD and to secure its sustainability. We offer a number of specific recommendations for how the Riksbank could exploit these opportunities.

Involving Researchers in Policy More Routinely

- Research could be integrated more fully into the life of the Riksbank without jeopardizing research standards
- Greater internal visibility for researchers would serve as a powerful incentive for researchers to continue to work on topics related to the Riksbank agenda
- The RD should be involved more systematically in policy through regular debriefings by a representative that attends important policy meetings
- Although econometricians have preformed a useful support role for forecasters by writing codes and, in general, providing technical support, more involvement of

- research econometricians in developing forecasting tools would be beneficial for researchers and policy economists
- Time allocations for senior RD researchers might be individualized to take better account of comparative productivity in research and policy work

Specific Recommendations

- Policy contributions as well as research should be evaluated more formally in annual appraisals
- Secundments should be instituted to enable individuals to move temporarily to and from research and policy work
- The Executive Board should hear presentations by the RD from time to time on topics of mutual interest
- Ad hoc task forces should be utilized to promote cooperation between the RD and the policy departments in support of projects deemed to be of bank-wide importance
- Model developers in the RD should remain involved in model use

Leveraging Research on Financial Stability

- Because the RD is located in the Monetary Policy Department (which is separate from the Financial Stability Department) opportunities remain unexploited for beneficial interactions between the RD and the Financial Stability Department

Specific Recommendations

- Researchers should comment regularly on financial stability publications
- Secundments and/or task forces should be utilized to develop more fully the synergy between researchers and financial stability specialists

Recruitment and Career Development

- The RD must work to maintain a balance between junior staff who possess the latest research ideas and skills, and senior staff who serve as mentors and a bridge to policymaking
- The RD should allow for dual career trajectories so that productive researchers can be exposed to policymaking and continue in the research department, and others can migrate with time predominantly towards policy work
- The Riksbank should explore opportunities to stimulate academic research in monetary economics, banking, and econometrics in Sweden to stimulate interest in central banking and encourage Swedish students to get a Ph.D. in related fields, so as to enlarge the pool of those who might be interested in a career at the Riksbank

Specific Recommendations

- The 80% time allocation for research should be maintained for the first three years after hiring a new Ph.D., but researchers should be exposed more systematically to policymaking thereafter
- Hiring should primarily be done on the junior market, but the RD should take advantage of opportunities to attract back to Sweden more senior people who have positions abroad, perhaps by creating a few advisory positions
- The Riksbank should utilize visiting scholars more actively
- Researchers should be encouraged to teach on occasion at universities
- The Riksbank should consider providing financial resources for university chairs

2. Introduction

The role of economic research in strengthening the conceptual and empirical foundations for policymaking at central banks around the world is well-established. Since its foundation a decade ago, the research group at the Riksbank has made important contributions to policy formulation and to the institution more generally. These contributions are remarkable given the relatively small size of the Riksbank, and its management of an independent monetary policy of a small country. Such circumstances create difficulties and challenges regarding the sustainability of the research group—an issue that we discuss in some detail below. However, they also create opportunities that the Riksbank has exploited to good advantage by harnessing the research group's productivity and flexibility in order to improve monetary policy. For instance, the Riksbank was an early adopter of an inflation-targeting framework for the implementation of monetary policy in 1993. More recently, the Riksbank research group developed the first open-economy dynamic-stochastic general equilibrium (DSGE) model suitable for guiding monetary policy and facilitated its integration into the policymaking process.

Going forward, the research group at the Riksbank can be expected to identify advances in the theory and practice of monetary policy around the world and to employ these ideas where appropriate to improve the models and tools used to make monetary policy in Sweden. The world-wide approach to monetary policy developed in recent years has enlarged greatly the scope for the international exchange of ideas and practices. In this regard, the research group at the Riksbank can be expected to play a critical role in improving Swedish monetary policy in the future. In particular, the research group is positioned to integrate advances in financial economics into policymaking at the Riksbank to address more comprehensively than in the past the relationship between monetary policy and financial stability.

Recognizing the key role that research must play in the Riksbank, the question is how best to institutionalize research within the bank to maximize its potential. This question divides naturally into two parts: 1) How should research be organized in the Riksbank to facilitate its usefulness internally for policymaking? and 2) How should research be organized to maximize the capability of researchers to interact productively with leading academic and central banker experts around the world?

To maximize their value inside the Riksbank, researchers must be involved in policymaking. Only by being involved can researchers be aware of how the latest advances from abroad might improve the models and tools used for policy. On the other hand, it is essential that the research group keep enough distance from day-to-day policymaking to sustain the high degree of specialization and focus needed to participate in the creation of new academic thinking on monetary policy by publishing in top academic journals and presenting their work at international conferences and seminars. Only by contributing to the production of such knowledge can researchers acquire and sustain the skill and judgement to know best how to develop models and tools for the

Riksbank. Moreover, the Riksbank can best judge the capability of its researchers through the certification provided by publishing papers in the best international academic journals in economics, finance, and statistics.

In-house research creates synergies in both directions. Researchers familiar with policymaking at the Riksbank and skilled in creating knowledge for publication are available for policymakers to “tap into” at critical times whenever there is a need to help think through an unprecedented or difficult policy problem. Involvement of the research group in the policy process provides insights that can be exploited to facilitate publishing in academic journals and to advance the practice of monetary policy.

Before we begin our assessment of the Research Division (RD) and offer our recommendations going forward, it may be useful to offer a brief description of the current structure of the division. The RD in the Riksbank is relatively small. It consists of a head of research, a deputy head, nine Ph.D. economists, one research assistant, and one secretary. One Ph.D economist is on leave to be replaced by a temporary hire, and the bank is looking to fill a vacant Ph.D. economist position. The RD will host two Ph.D. candidates this coming year and plans to host a long-term senior guest researcher from the Norwegian central bank. Over the years the RD has hosted a number of internal guests from the policy departments at the Riksbank. Five out of eleven researchers are of foreign descent in keeping with a strategy to hire new Ph.D. staff on the American job market.

The Riksbank board of directors instructs researchers to allocate 80% of their time to research for publication in recognized international academic journals in the fields of macroeconomics, monetary policy, banking and finance, and statistics and econometrics. The RD has a collective target based on the size of the department of twelve articles per year “of about the standard of the (former) *European Economic Review* or better.”

Individual research projects as well as research agendas are to a large extent formulated by the researchers themselves. Directed research appears to be rare. The department heads recognize that it is necessary to encourage and reward self-directed research to attract, develop, and retain internationally recognized economists of the highest calibre. Nevertheless, in practice researchers have chosen to work on projects that either directly or indirectly help support the various missions of the Riksbank.

Over the years, the 20% of time allocated by researchers to direct policy support has shifted from advising the actual formulation of policy to supporting policy analysts. This shift appears to be due in part to the successful introduction of the open-economy dynamic-stochastic general equilibrium model in the policy process. The utilization of the DSGE model to help formulate quantitative forecasts of relevant macroeconomic variables appears to have systematized the forecasting process enough for researchers to provide direct policy support on a more ad hoc basis. In addition to targeting research to improve models and tools for policymaking, researchers also support policy by writing articles and performing editorial support for Riksbank publications. Researchers are said to participate in some (but far from all) policy meetings.

We next turn to an assessment of the RD's research productivity in Section 3. Then, we conclude in Section 4 with a discussion of the key challenges faced by the RD and our suggestions for addressing these challenges.

3. Productivity Assessment of the RD

A. Introduction

In this section we assess the productivity of the RD. This assessment has three parts: A) an assessment of the RD's output, B) an assessment of the value of this research to the Riksbank and the extent to which the institution has exploited this value, and C) an assessment of the general research environment in which the RD operates.

B. Research Output

We take three approaches to assessing the output of the RD. We begin with a general overall assessment of the division's research and its impact. Then we benchmark the division's performance against its own target of 12 high quality publications per year. Finally, we offer a more comprehensive assessment based on a wider set of metrics traditionally used to evaluate research productivity and impact.

B.1 General Assessment

The division has acquired a strong external reputation for high quality and central banking-relevant research. It is best known for developing the first operational open-economy DSGE model, Ramses, to be fully implemented in a central bank. This DSGE work has given the division and the Riksbank tremendous international recognition. The Riksbank is now widely regarded as a global leader in developing this type of macro model. Part of this recognition and impact comes from the publications on the DSGE model by Riksbank researchers in highly-regarded journals such as the *Econometric Reviews*, *Journal of International Economics*, and *Macroeconomic Dynamics* and in policy oriented venues such as the Riksbank's own *Economic Review*. Part of this impact also comes from direct contact by Riksbank research economists with other researchers through conference participation and seminars, as well as visits to the Riksbank by outside researchers from other institutions who want to learn about Ramses and its implementation.

The breadth of research at the Riksbank, of course, extends well beyond DSGE modeling and spans many other areas of economics, finance and statistics. While visibility in these other areas has not had the chance to rise to the level of the Riksbank's DSGE work (given the past size and focus of the RD), there are clearly signs that the division has and can capitalize on this template to achieve recognition in a wider span of research areas related to central banking (e.g., inflation targeting, productivity, credit risk modeling).

This breadth has already been reflected in publications, working papers, and work-in-progress.

B.2. Assessment Against the Riksbank Benchmark

Now we turn to an assessment of research output by benchmarking the division against the standards set by the Riksbank itself. The Riksbank has established a collective target for the RD of 12 articles per year published in journals “of about the standard of the European Economic Review (EER) or better”. This collective target implies that the 11 research economists should publish on average a bit more than one paper per year. In order to calibrate the EER “hurdle” we will rely on a study of journal impact conducted at the Federal Reserve Bank of Boston by Kodrzycki and Yu (KY). KY may be the most appropriate benchmark study for three reasons: it is recent (2006) and therefore is more up-to-date than other studies with respect to including newer journals; it contains both finance and economics journals; and, it measures impact at the article level (i.e., impact per article). Based on per article impact “within economics,” the EER was ranked by KY at 32nd, and based on per article “policy impact” it was ranked 27th.

Using this metric we can assess the extent to which the research group has met its own target. In doing so, however, we recognize that great care needs to be exercised in how we interpret whether journals should be considered “about the standard of the European Economic Review or better”. This is because journal rankings tend to be very sensitive to a variety of factors.¹ For example, the *Journal of Money, Credit and Banking* is ranked four journals *below* the EER in a KY ranking that does not adjust for citation intensity (the tendency of some journals to have more citations) and eight journals *above* in a KY ranking that does adjust for citation intensity. More broadly, it should be emphasized that any metric that we use as a proxy for the Riksbank’s quality hurdle is necessarily prone to interpretation and some estimation error.

With this in mind, we show in the table below three different measures of the RD’s publication output. The first column shows the total number of research journal publications (or forthcoming articles) without regard to journal quality. The second column shows the RD’s publication output *primarily* based on journals ranked by KY in the top 75. However, we have augmented this set of journals in order to adjust for the fact that some good journals are not ranked by KY. For the most part, these “missing”

¹ Research on evaluating the impact of journals suggests that journal rankings are highly dependent on a number of different issues including, for example, ranking objectives, data issues and weighting issues. Ranking objective is an important issue because journal impact can either be measured at the article level (per article impact) or measured at the journal level (aggregate citations of the journal). Another issue related to ranking objectives is whether one wishes to measure the impact on the economics profession (i.e., impact on research journals) or impact on policy (impact on policy journals). An important data issue is whether a journal has been in the key data set, the *Journal Citation Reports* (JCR), for a sufficiently long period. This is a relevant issue for Riksbank researchers, as we note above, because they have published in many journals not included in *JCR*. Another key data issue is the choice of journals used as citation sources. Citation period is also important in order to avoid a bias in favour of journals that have a long publication history. Weighting issues include the quality of the journal and “reference intensity” of the journals cited. (See “New Approaches to Ranking Economics Journals” by Y. Kodrzycki and P. Yu, Federal Reserve Bank of Boston working paper 05-12, June 2006.)

journals were started too recently to make it into the database that is commonly used (and used by KY) to rank journals, the *Journal Citation Reports (JCR)*. (Nevertheless, KY is still one of the most current journal impact studies available.) There are at least 23 journals that Riksbank researchers have published in that are unranked in KY. Many of these are relatively new and many are specialty journals. In our view some of these journals should be considered equivalent to the top 75 journals listed in KY, specifically *Computational Economics*, *Econometric Reviews*, *International Journal of Central Banking*, *International Journal of Forecasting*, *Journal of Time Series Analysis*, *Review of International Economics*, and *Studies in Non-Linear Dynamics and Econometrics*.² Admittedly, this is a “judgment call” on our part -- and it is a determination about which reasonable people can disagree. However, there is no alternative to a subjective determination on our part if we wish to give credit for publication in some of these journals. So, we have added these 7 journals to our KY list. We call this the “KY Top 75” in column two of the table (but, in actuality, it is a list of 82 journals – the 75 from KY plus the seven that we have added).

The third column is a stricter criterion which is driven by the top 50 journals ranked by KY. Here we have added two of the above journals which we view as equivalent to the top 50 in KY – specifically, *Econometric Reviews* and *International Journal of Central Banking*. So our “KY Top 50” in the table is actually comprised of 52 journals.

Publication Output*			
Year	Total Publications	KY Top 75 Publications	KY Top 50 Publications
2005	15	10	6
2006	13	9	8
2007	19	13	11
2008	7	5	4

*Includes only publications by Riksbank economists that they worked on while they were at the Riksbank.

We can see from the first column that based on the total number of publications the RD exceeded the hurdle number of 12 publications in the past three full years. Based on a “KY Top 75” benchmark, the division exceeded the hurdle in 2007 but fell somewhat short in 2005 and 2006. On average for the past three full years the division came close

² The “missing” journals in KY that Riksbank researchers have published in are: *Applied Econometrics and International Developments*, *Communications in Statistics – Theory and Methods*, *Comparative Economics Studies*, *Computational Economics*, *Computational Statistics*, *Computational Statistics and Data Analysis*, *Contributions to Macroeconomics*, *Econometric Reviews*, *Econometrics Journal*, *Economic Systems*, *Economics of Governance*, *Empirical Economics*, *International Finance*, *International Journal of Central Banking*, *International Journal of Finance and Economics*, *International Journal of Forecasting*, *Journal of Economics and Business*, *Journal of Financial Services Research*, *Journal of Financial Stability*, *Journal of Futures Markets*, *Journal of Time Series Analysis*, *Review of International Economics*, *Studies in Non-Linear Dynamics and Econometrics*.

to its target publishing 10.7 papers per year in “KY Top 75” journals. Based on the stricter “KY Top 50” benchmark, 2007 was the division’s best year -- just missing the hurdle number of 12 by one publication. However in the prior two full years the division published 6 and 8 articles respectively that met this tougher standard. While the division has fallen a bit short on average of its goals, we would still regard this three full year performance as solid noting that a number of the division’s publications were in journals considerably better than the EER. Also, we emphasize that the strong performance in 2007 shows that the division is certainly capable of meeting its target. In 2008 it appears likely that the division will fall short of its own benchmark given that, at the time of this writing, there are only four “revise and resubmits” (articles in the second round) in the division’s pipeline at “KY Top 75” journals. However, we wouldn’t place too much emphasis on this year’s performance in light of the four new hires in the division – three of whom received their Ph.D.s in 2007 and one who received it in 2005. We would expect to see evidence of their productivity reflected in publication success beginning next year.

B.3. Assessment Against Traditional Benchmarks

There are several limitations to relying on just a single metric to assess the division’s research output and impact (i.e., relying solely on the group target hurdle of 12 articles in journals comparable or better than the EER). One limitation is that publications by themselves may not give a complete picture of the division’s impact and visibility. Another limitation is that past group publications may not reflect the current composition of the department. This applies to the Riksbank in part because there are four new researchers. Also, there are several Riksbank researchers whose publications are not reflected in the group vita because they did not work on these papers while at the Riksbank. We feel that the current visibility of the department will be affected not only by the group’s past publication productivity but also by the perception of scholarship reflected in its *current* composition. So, in our view it seems appropriate to turn to a more comprehensive assessment of research output that takes into account the current composition of the department and assesses productivity at the researcher level. In this regard we will employ a number of metrics commonly used by comparable research departments elsewhere.

The next table, “Individual Research Output” (see last page of this section), shows publications and working papers by researcher, by year, based on the “KY Top 75” hurdle used above. The shaded area in the column indicates when a researcher’s career began. One characteristic of the division that is immediately apparent from this table is that the RD is quite young. Therefore, it is important to adjust for the fact that the publication output from the junior portion of the division cannot be expected to have achieved the publication rate of the seasoned researchers given typical journal acceptance lags. Another interesting feature that is immediately apparent in the table is that all of the seasoned researchers continue to be active. Thus, there is no evidence of dead weight in the division.

The first summary statistic in the table shows the total number of “top 75” publications over each researcher’s career. Possibly more informative, however, is the next statistic which shows this publication output normalized by the number of years since the researcher’s Ph.D. was granted (i.e, the non-shaded years for each researcher). Among the seven seasoned researchers, this “top 75” publication rate varies from .5 to 1.5 per year and averages .92 per year (not shown). In terms of total publications the rate varies from .7 per year to 2.13 per year and averages 1.36 per year (not shown). These statistics are consistent with the first table on group productivity – although this table represents a somewhat different composition of researchers. In particular, the division’s total publication rate significantly exceeds the 12 per year hurdle and it just about hits the quality-adjusted hurdle based on a “KY Top 75” benchmark. We should also add that the somewhat lower publication rate for the two most senior researchers seems understandable given their additional responsibilities as Head, and Deputy Head, of Research. Another virtue of this individual-based/current composition analysis is that it may be a better predictor of future publication rate than the group analysis above because it reflects the division’s current productivity characteristics.

The last statistic in the table shows the ratio of “top 75” publications to total publications. If this ratio is too low, it may suggest that a researcher is not targeting his/her research toward sufficiently high-level journals. There is some variance in this ratio across the seven seasoned researchers. If this ratio gets too low, there may be some cause for concern regarding the allocation of time between potentially high impact research and lower impact research -- a critical choice variable in research career management. Given the division’s average of .68 (among the seven seasoned researchers) we do not see any particular cause for concern here. Also, we recognize that sometimes publications in non-top journals can still be visibility-improving for the division. Examples of this might be papers on the DSGE model where these might further fortify the division’s reputation as an epicenter of research in this area.

We offer one more note on publication quality. A concern that arises when institutions set quantitative hurdles is that these hurdles can affect incentives in unintended ways. In particular, there is a possibility that researchers at the Riksbank might aim too low in order to maximize the number of EER-comparable journal hits. This would manifest itself in too few publications in journals that are unambiguously better than the EER because articles published in the journals such as the *Quarterly Journal of Economics* or the *Journal of Financial Economics* would not be valued sufficiently more than an article in the EER. This would be unfortunate given that the impact factor of one top publication is much greater than that of several medium quality ones.³ It is difficult for us to assess whether this has affected the past publication productivity of the group. However, we believe that it is an issue that the Riksbank may wish to consider going forward. A target of twelve papers per year in journals of medium quality may not provide sufficient incentive to work on occasionally more ambitious publications while at the same time freeing some time for policy work. It is encouraging to note, however, that

³ In the KY study, for example, the *Quarterly Journal of Economics* and the *Journal of Financial Economics* had an impact “index” rating of 77.89 and 63.64 respectively, while the *European Economic Review* had an impact “index” rating of 12.04.

there is clear evidence that the research group has published in journals that are significantly better than the EER. These include, for example, the *Journal of Monetary Economics*, *Journal of Political Economy*, and the *Review of Economics and Statistics*. But, whether Riksbank researchers would have published more in these (very) top journals under a more quality-adjusted system is not clear. On the one hand, it is possible that Riksbank researchers primarily respond to the external labor market diminishing the importance of this potentially negative incentive effect. On the other hand, if researchers -- and the research group -- were evaluated and rewarded based on the quality of journal venue, they might target their research to higher level journals. On balance, it is our view that the Riksbank should consider moving from a strict application of the current rule (12 per year at or above EER-level) to a more value-weighted measure that gives more weight to higher impact journals.

In assessing the division's productivity, it is also important to consider the current pipeline of research in the form of working papers and work in progress. On this dimension the RD looks strong. All of the researchers appear to have well-defined research agendas that are reflected in both existing working papers and work-in-progress. For example, as a whole the group has 40 completed working papers -- although not all of them are recent papers. Given the typical time lag between completion of a working paper and acceptance by a journal, the pipeline seems to us to be consistent with a publication trajectory that could hit the group target of 12 publications in good journals going forward, though not necessarily in the next year. Also, the group appears to be targeting journals consistent with the EER hurdle level. In particular, the division currently (or by the end of October) has 17 papers under review. All of these are under review at "top 75" journals, most at "top 50". Four of these are in the second round, which as we note above likely means that the division will not meet its group target in 2008, but hitting the group target for 2009 may be within reach.

Another metric that can be used to measure the external impact of the RD is participation in conferences as presenters and discussants. Also important are invitations to present work at other research institutions. The group as whole is active on these dimensions. All of the researchers regularly attend and participate in conferences. Appropriately there is a mix between general conferences and specialty/field conferences. Also, appropriately there is widespread attendance and participation among the group in central banking conferences and presentations. One mild concern we have is that visibility in the very top general conferences -- either as presenters, paper discussants, session chairs or panel members -- appears somewhat less than optimal for a RD with the aspirations of the Riksbank. More participation in top general conferences (e.g., American Economics Association Meetings, American Finance Association Meetings, CEPR-sponsored conferences, NBER conferences, Western Finance Association meetings, and the European Finance Association meetings) would likely improve the visibility of the division.

Citation count is also a useful metric to assess research impact. Of course, it will partially reflect the quality of journals that researchers publish in. (Recall that the KY rankings are driven by per article citation count.) Citation count will also reflect the professional

age of the researcher given a strong “seasoning effect” -- the older the paper, the more time to accumulate citations. Citation count, however, can provide important additional information beyond publication count. In particular, it can reveal high impact (and low impact papers). Thus, it is not necessarily the case that citation count at either the individual level or the group level will mirror publication count. Based on Google Scholar, the division’s aggregate citation count is 2,258 citations. This is an appropriate number for the RD given its size and age. Not surprisingly the younger researchers have low citation counts (which is to be expected), and the more seasoned researchers have higher citation counts. For example, Tor Jacobson who has been a researcher for 17 years has the second highest citation count in the section with 398. In general, the citation count of the RD mirrors the professional age of the researchers and the quality of the journals they publish in. The one interesting exception on the age dimension is Ulf Soderstrom who has the highest citation count in the division (702). So for this researcher, his *publication* count, which nevertheless is very strong, still understates his research impact.

Another useful metric to assess visibility is journal refereeing. The connection to visibility is quite direct. Journal editors choose referees based on their respect for the researcher’s knowledge and competence. We would expect a highly visible research group to be refereeing in the profession’s top journals. This is the case with Riksbank researchers. They are refereeing in many of the most highly regarded journals in economics including the *American Economic Review*, the *Journal of Econometrics*, the *Journal of Monetary Economics*, and the *Journal of Political Economy*. Particularly encouraging is the refereeing activity of the unseasoned researchers. This shows that they already achieving visibility in the eyes of journal editors.

Aside from these objective measures of research productivity, based on our readings of the papers themselves, Riksbank researchers are making significant contributions on the frontier of scientific knowledge. For example, the paper entitled “Bayesian Estimation of an Open Economy DSGE Model with Incomplete Pass-through” was highly influential inasmuch as it was the first to present and estimate a DSGE model suitable for monetary policy analysis in an open economy.⁴ In writing the paper, Riksbank researchers demonstrated resourcefulness in drawing on the latest monetary and statistical theory world-wide to produce a product that has proven to be useful in implementing monetary policy at the Riksbank and around the world. A second example of a paper that employs theory to improve practice is “Monetary Policy in a Small Open Economy with a Preference for Robustness.”⁵ This paper uses “robust control” techniques to show how an open-economy central bank should formulate policy to minimize the economic consequences of worst-case specification errors found in the exchange rate equation. A third example potentially useful for practical policy is “Reconsidering the Role of Money

⁴ Adolfson, Malin, Stefan Laseen, Jesper Linde and Mattias Villani, “Bayesian Estimation of an Open Economy DSGE Model with Incomplete Pass-through,” *Journal of International Economics* 72, 2007, 481-511.

⁵ Dennis, Richard, Kai Leitemo, and Ulf Soderstrom, “Monetary Policy in a Small Open Economy with a Preference for Robustness,” October 2008 working paper.

for Output, Prices and Interest Rates.”⁶ The workhorse “new Keynesian” model of monetary policy widely used today has the property that the levels of output, prices, and interest rates are determined independently of the quantity of money. This paper employs restrictions implied by the new Keynesian model to identify shocks to a broad monetary aggregate in a vector autoregression (VAR), and finds that monetary shocks have significant effects on output, prices, and interest rates, suggesting that central banks should explore further the role that money might play in the implementation of monetary policy. Finally, Karl Walentin's work on financial friction and investment seems promising and ambitious. The authors propose a model of investment with financial constraints where inside investors, when wealth is scarce, receive higher returns than outsiders. The model, when calibrated, is able to match correlations between investment, q , and cash flow. The key mechanism is limited enforcement which causes a positive time varying wedge between marginal q and average q . Karl is pursuing related ideas in his ongoing research.⁷

In summary, we feel that Riksbank RD is making a significant impact on the research community and has become quite visible externally. It is well-positioned to continue on this trajectory although it may fall a bit short of its 12 publication quantitative goal in the next year as the work of the junior researchers moves through the pipeline. We would anticipate, however, that the division’s output should meet and even exceed this goal thereafter.

C. Institutional Value of Research Output

We next turn to an assessment of how valuable the RD has been to the Riksbank itself. The Riksbank can benefit from the output of the division either directly through the research itself or from the policy allocation of division’s output (i.e., the 20% of the research time that is targeted to policy work). The Riksbank has clearly benefited on both counts. It is important to note that both depend on the policy-relevance of the research itself. In our view, this is a tremendous strength of the RD. The vast majority of research produced by the division is directly related to the overall policy mission of the Riksbank. This is a somewhat remarkable outcome given that very little of the research has been “directed” by the Riksbank in terms of any explicit incentive mechanism. It appears to us, therefore, that the *ex post* policy-relevance of the division’s research output is likely mostly related to fact that the division has been staffed with researchers whose preferences align with institution’s preferences. This positive outcome is not always the equilibrium in central banks. As we argue elsewhere in this report, it is important that this research “relevance” continue in order to justify a high allocation of time to research.

A discussion of the direct benefit from the division’s research must necessarily begin with the initial focus of the division on developing Ramses. Here there was a feedback

⁶ Favara, Giovanni and Paolo Giordani, “Reconsidering the Role of Money for Output, Prices, and Interest Rates,” *Journal of Monetary Economics* forthcoming.

⁷ Lorenzoni, Guido, and Karl Walentin “Financial Frictions, Investment and Tobin's q ” *Review of Economic Studies*, revise and re-submit.

loop between developing Ramses and writing papers about Ramses and DSGE models. In other words, the work on model building directly benefited the policy mission of the Riksbank and was, at the same time, the content of research publications. It is simply impossible to overstate the relevance of this research productivity to the Riksbank. We believe that there may be other possibilities for this type of direct policy relevance both in the areas of macroeconomics and financial stability. The current work on expanding the DSGE model to include the financial sector is good example of this.

The alternative conduit through which the RD can provide value to the department is through the 20% policy allocation of research time. Researchers are said to participate in some (but far from all) policy meetings. Also, our discussions with staff members in and outside of the RD revealed a variety of examples where other divisions and departments have accessed the division's resources. These include econometrics consulting and default risk consulting, as well as continuing model consulting. Participation in the preparatory meetings for the Financial Stability Report is another example. However, it is our impression that these opportunities are under-exploited. For example, a recent housing conference was organized by the RD on an extremely policy relevant topic. Some of the top researchers in the world on this topic participated. It is our understanding, however, that there was virtually no attendance at the conference by members of the Financial Stability Department. This strikes us as odd.

Another example of a potential opportunity to provide value lies in the research department's residence expertise in credit default modeling. The division has two researchers working on the cutting edge of this area utilizing micro loan data on Swedish banks. The relevance for feedback to the Financial Stability Department seems obvious to us to include calibrating and testing the Department's bank-level models with the RD's loan level models. Our understanding is that some communication on this topic has taken place but this opportunity for information sharing also appears under-exploited. We will return later in this report to a further discussion of these unexploited opportunities and their importance to the institution.

The RD also contributes to the policy mission of the Riksbank through its policy publications. It contributes, for example, periodically to the Riksbank's *Economic Review*. These articles are often on topics that the Riksbank is well-known for such as inflation targeting and its Ramses model. These may have had a particularly positive impact in terms of Riksbank visibility. In addition, the RD contributes to the *Economic Commentaries* series both in terms of editorial support and article contributions. A good example is an *Economic Commentary* contributed by Karl Walentin in 2008 entitled "House Prices and the Economy" in which he and his co-author describe the potential effects of changes in the housing market on the Swedish economy using a general equilibrium model that is in some ways similar to Ramses. It is hard to imagine a topic more relevant given the central role of real estate in the current global financial crisis.

D. Assessment of the Research Environment

Our assessment of the research environment is overall quite positive. The RD runs a regular seminar series of 20-25 visitors per year. Since 1999, the RD has organized ten workshops with international participation, either on its own or in collaboration with other departments in the bank. For instance, this fall the RD organized two workshops, one on “Household Indebtedness, House Prices and the Economy,” and another on “Modelling and Forecasting Economic and Financial Time Series with State Space Models.” The RD has close contacts with the local academic community. One researcher has a part-time position as an associate professor at Stockholm University. Through the years several researchers have lectured in the graduate program there, and helped to supervise graduate students.

In our discussion with researchers the feedback on resources was almost entirely positive. The one binding constraint that we identified was a lack of research assistance. In particular, there is only one research assistant for the entire division. In our view this is significantly out of line with research groups in other central banks and academic institutions. It is typical at the Federal Reserve Board and at Federal District banks to allocate about one research assistant for every two researchers. Typically, research assistants in the Federal Reserve System are recent graduates in economics and finance who stay for about two to three years and then enter Ph.D. programs.⁸ This might be a good model for the Riksbank to follow. The payoff from an additional two or three research assistants in terms of productivity could be enormous. We also recommend finding creative ways to hire research assistants on a temporary basis to guarantee better research support.

On the other environmental dimensions, the RD seems to be in good shape. Computer resources and data seem entirely adequate. The research seminar series is quite active and appears adequately funded. The travel budget also seems adequate. In particular, the RD’s travel budget per researcher of SEK 34,550 is in line with the travel budgets at good economics and finance departments. The budget for conferences, visitors, and seminar speakers of SEK 825,000 seems adequate. The division allocated SEK 275,000 for each of two conferences this year. This also seems appropriate and by no means extravagant.

One other suggestion regarding the research environment is that the RD might want to consider having a group of consultants (i.e., visiting economists) that interact on a regular basis with the division. Most of the Federal Reserve District banks have a group of consultants who regularly visit the bank. It is not uncommon for them to come several days a month, for example. The frequency and continuity associated with such a group could be helpful in generating long term relationships with Riksbank researchers. Given the age of the department this group could provide needed mentoring for the younger members of the division. Certainly the addition of Ulf Soderstrom will also help on the mentoring dimension.

⁸ Research assistance at the ECB is not as well-funded as at the Federal Reserve system. On balance, it is more comparable to the current situation at the Riksbank.

Individual Research Output

Year Completed PhD	Tor Jacobson 1992	Kasper Roszbach 1998	Ulf Soderstrom 1999	Mattias Villani 2000	Malin Adolfson 2001	Paolo Giordani 2001	Mikael Carlsson 2002	Karl Valentin 2005	Daria Finocchiaro 2007	Virginia Queigo von Heideken 2007	Mathias Trabandt 2007
1992											
1993											
1994											
1995											
1996											
1997	1										
1998	1										
1999											
2000											
2001	3	1	1	2							
2002			1								
2003	1	1				1	1				
2004		1				3					
2005			4	1			2				
2006	1	1	1	2		1					
2007	1	1		4	4		2				
2008			3	1	1	1					
Forthcoming				2	2	1		1			
Top 75	8	5	10	12	7	7	5	1	0	0	0
Top 75/Year*	0.50	0.50	1.11	1.50	1.00	1.00	0.83	0.33	0.00	0.00	0.00
Total Publications	20	7	14	17	11	8	6	1	0	0	0
Total Pub/Year*	1.25	0.70	1.56	2.13	1.57	1.14	1.00	0.33	0.00	0.00	0.00
Working Papers	2	5	5	2	7	1	3	6	2	3	4
Total Papers	22	10	15	14	14	8	8	7	2	3	4
Total Papers/Year*	1.38	1.00	1.67	1.75	2.00	1.14	1.33	2.33	2.00	3.00	4.00
Top 75/Total Pubs	0.40	0.71	0.71	0.71	0.64	0.88	0.83	1.00	-	-	-

*2008 plus forthcoming considered as one year

4. Challenges, Concerns, Opportunities and Suggestions

As shown in Section 3, the RD at the Riksbank has been successful in publishing in highly-regarded academic journals, in generating external visibility and in policy-relevant model development. However, some challenges remain to sustain and further develop the quality of research and to promote the research output in the institution.

Fundamentally, the question is whether the model for research at the Riksbank is sustainable. We have identified three main sustainability challenges. Below we describe them and suggest improvements.

A. Challenge 1: Involving Researchers in Policy More Routinely

One of the main challenges for the Riksbank is to integrate research into the life of the institution without jeopardizing research standards. Integration can be achieved only if research acquires internal visibility (within the institution) and only if it gets recognized as a useful input into the process of policy preparation. By this we don't necessarily suggest a regular involvement of research into the briefing process, but rather an involvement of the researchers in the discussion related to the policy and forecast preparation, possibly building up scenario analysis or ad hoc analysis on special topics (some examples on how this is done at different institutions will be provided below). This involvement will also ensure that the researchers are not cut off from the information flow within the institution.

Internal visibility implies recognition and therefore serves as a powerful incentive for researchers to work on topics that are related to the Bank's agenda (motivation). This is also key to making sure that the researchers identify with the institution. To achieve this general objective, institutional occasions that help develop mutual awareness of opportunities (policy that informs research and research that informs policy) must be created. It is important to recognize that, to achieve this objective, both the policy and the research side must become aware of the opportunities that this exchange creates for both. This is a two-way process. How can research capitalize on policy and policy capitalize on research?

Problems associated with promoting a culture of integration derive from the isolation of the RD from the rest of the institution. The RD is not systematically involved in policy meetings. As we understand, one or two researchers attend regularly, but there is no participation by the management of research and no debriefing to the staff on the discussions that have taken place at these meetings. Moreover, research is rarely in contact with the Executive Board (EB) and there are no institutional occasions for this contact to take place (we understand that there is an annual meeting between the research department and the EB, but no regular occasions for brain-storming or briefing on research based policy analysis).

Although research has been responsible for the development of the DSGE model and it is now involved in the construction of the new model, it has not been involved in the use of the model for policy. We think that the lack of connection between model development and model use is a negative for both the researchers (unawareness of the challenges) and the forecasters (lack of expertise). This problem has not yet been felt by the institution since one of the model developers left research to become head of modeling, but this was a bottom-up decision and some thought must be given as to how to cope with this problem in a systematic way.

More involvement of RD econometricians in developing other forecasting tools would also be desirable as would their involvement in tool development in financial stability work. Again, we want to stress that the role of research cannot be seen as that of pure consultation. Researchers must be aware of the policy process in order to adapt their technical expertise to the demands originating from that process that are not necessarily those of the academic environment. Nevertheless, this awareness can also be potentially very productive from the academic perspective.

Research, however, is not only about technical expertise. Good researchers are also able to think analytically on a number of questions that may come up unexpectedly and can therefore be used for brain-storming both by senior managers and executive board members. It would be useful to facilitate this type of communication for both researchers (inspiring them and making them feel part of the institution) and policy makers (using the human capital of the institution).

We think that to achieve the goal of integration that we have defined above, an 80-20 repartition between research and policy on average is not appropriate and that more time for policy should be freed up. However, we also think that it might be desirable to have different targets for different people. Research time should be protected for the first three years after the Ph.D. For more senior people, targets might be individualized depending on comparative advantages.

We also want to stress that research and policy are not entirely separate functions, so that, with some exposure to policy, research is bound to become better and more topical while the analysis supporting policy is likely to improve. Clearly, it is not optimal to under-weight research either. This will potentially lead to a rapid deterioration in human capital and, as a consequence, a deterioration in the quality of the analytical contribution to the the policymaking process. With the right system of incentives and an appropriate management of resources, both sides are likely to benefit. At the Riksbank there have been many examples of integration of research and policy work, but it looks like this happened almost by chance, as the result of the “right person being in the right place”. Although to impose an excessive bureaucratic structure would be undesirable in such a small institution, a number of more pro-active measures to facilitate the process of integration might be considered.

Suggestions for improvements stemming from successful experiences at the Riksbank and other institutions:

- i. *Policy contributions (quality and quantity) should be evaluated in the course of the annual appraisals [what gets measured gets done].*

Although it is more difficult to evaluate policy work than to evaluate research on a quantitative basis, many things can be done in this direction. For example, one can keep track of contributions to policy reviews, development of tools, or other inputs into the policy process. In general, the criteria for evaluation must be determined and performance must be appropriately rewarded. It is important that the policy areas are asked to contribute to this evaluation process.

- ii. *Secondments.*

By secondment we mean a system which will make it possible for researchers to be on loan to policy areas for a limited period of time and for policy people to spend some time in research to complete a project. The projects on both sides might be jointly designed and managed by the management of research and the policy area involved.

- iii. *Researchers may propose seminars to the Executive Board on topical issues.*

These seminars could be an occasion for keeping the Board informed on the research perspective on issues of policy importance. At the ECB, for example, there is a seminar roughly once a month (these are not seminars on a single paper, but rather they give ``a research view'' on a particular subject). Several topics are proposed by the staff and then selected by the Board. These occasions afford an excellent opportunity for interaction, give the staff valuable exposure to policy makers and provide them with an incentive to become full partners in the institution.

- iv. *Ad hoc task force on specific projects which are considered key for the institution.*

When key projects are identified, it is desirable to create a task force including both researchers and policy staff to work at the design and completion of the project. A successful example of this type of collaboration is the DSGE project. Although the collaboration has not been formalized in this way, de facto, model development has been the result of team work between developers and users. It is important that the Riksbank reflects on its own successful projects and the lessons which can be learned from them. Other examples of successful projects of this kind come from the ECB where forecasters and researchers worked together in a task force to develop new models for short term forecasting and the analysis of the real time data flow. In that experience, both econometric expertise and data

knowledge (as well as briefing expertise) turned out to be key for the success of the project. In general, we think it is not a good idea to separate model developers from model users.

v. *Ramses*.

The Riksbank should reflect on its own successful projects, in particular the experience of Ramses. The success of this project stemmed from the fact that the model was brought to policy by the same people who developed it. Now that the model is being extended to include financial and labour market features, it is key that model developers and model users not be separated. We also anticipate that smaller models will be increasingly useful for policy analysis and researchers should not be cut-off from the deliberations on how to combine inputs from different models and on what are the key features to emphasise in new tools.

B. Challenge 2: Research and Financial Stability

The present organization at the Riksbank grants research a quasi-independent status within the monetary policy department. Research is also involved in financial stability work but has no organizational connection with that department. This creates an asymmetry which partly explains why the connection with monetary policy has been more successful than with financial stability. It would be desirable to reflect on this asymmetry and to correct it although we think that, given the small size of the group, it would not be a good idea to split the research group between the two departments. Without major changes in the institutional structure, we recommend that researchers comment on Financial Stability publications on a regular basis and/or use the secondment and task force schemes suggested above. Again this should be a two way process and we also recommend that staff at Financial Stability be encouraged by managers to attend research events on topics of interest to the department (see the example in Section 3C).

On a more conceptual basis, there are fundamental challenges in understanding the connections between monetary policy and financial stability. The academic literature is not very developed on these issues and there are potentially high payoffs from encouraging the policy experts and the researchers to define joint analytical projects. Given the different culture of the two departments, the institutional design, and the lack of success of past initiatives of collaboration, this process will have to be managed very carefully.

C. Challenge 3: Recruitment and career development

The research group recruits new Ph.D.s in the international market, but most recruits are from Swedish Ph.D. programs. Since Sweden is a small country and local universities don't have a specialization in monetary economics or econometrics, there is a case for the

Riksbank assuming an active role in developing this field. At the moment, this has been done with the creation of an academic style research group within the bank. Although we understand this development, we think that the Riksbank could take other measures to stimulate academic research in monetary economics, banking and econometrics in the Swedish community.

Here are some ideas: financing one or two chairs at the university; using more actively senior visiting scholars; using the staff to teach an occasional course at the university (it is interesting to note that the involvement of one staff member in teaching graduate macro at the university has produced one Ph.D. who was subsequently hired in the research group). A central bank cannot be a substitute for a university, but there may be many potential ways to create synergies (without the two parties losing their focus) by establishing links with the academic research community.

There is no doubt that the vitality of any research department depends crucially on younger researchers. However, age balance is an important component that can affect both research productivity and career management. The role of senior (mid-career) researchers is crucial for mentoring, and also crucial for building bridges to other departments in the bank. As currently constructed, the RD is skewed toward youth. This is terrific from an energy and vitality perspective, but probably not optimal overall.

Another important issue related to career management is career trajectory. Some researchers continue to be highly research-productive into the later stages of their careers. Others naturally migrate with time towards a more policy-oriented focus in their work. It is important that the Riksbank research model allow – and encourage – both types of career trajectories. On the one hand, retention of senior research-active members of the RD will naturally improve the age mix of the RD. On the other hand, the natural migration of seasoned researchers into the policy side will inform policymaking and will improve connectivity between research and policymaking. Thus, it is important that researchers who prefer this route are able to develop their career in the policy areas in the bank.

In light of this age distribution issue and the career trajectory issue – as well as the broader issue of better integrating the RD with the policy work of the Riksbank -- we offer these two suggestions:

- i. Granting 80% research time has been an attractive feature of the job in research and a mechanism which has attracted top people. We recommend that the rule of 80% research time should be preserved for the first three years after a Ph.D. but we think that researchers should gradually be more exposed to the life of the institution. This exposure will enhance the connectivity of the RD to the policy work of the Riksbank. It will also allow for the development of a more diversified career for those who might eventually leave the research trajectory for policy work. For those researchers who show an inclination towards policy work, it would be logical to allow for a gradual

increase in policy work. This would imply for this subset eventually move to something like a 50%-50% research-policy allocation. Thus, the overall allocation of the RD could move to something like a 60-40.

- ii. Although we recommend continuing hiring on the junior market, some resources should be allocated toward attracting back to Sweden more senior people who have positions abroad. One approach here would be to create few continuing advisory positions. These positions would involve regular periodic visits to the RD (e.g., one or two days per month).