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Small is beautiful: measuring the research input and output of European central banks

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Abstract

In this note we analyse the research activities of the central banks in the European Union (EU) over the period 1990–1999 both in terms of input (research staff) and output (papers in international journals). The share of research staff in total staff of the national central banks varies between 0.02 and 0.16. The ECB has the highest ratio between researchers and other staff. We make a ranking of the research performance based on the number of scientific papers per employee engaged with research. The Bank of Finland has the best research performance of European central banks, closely followed by the Dutch central bank. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

Central banks have a number of functions, ranging from formulation and supervision of monetary policy to supervision of financial institutions. A good research department may be instrumental for performing these functions by assisting in formulating monetary policy. Good research is, however, a factor of its own for the reputation and credibility of central banks. Although good research is important, the quantity and quality of research of central banks and international financial organisations has not been investigated.

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An external committee evaluated the research activities of the International Monetary Fund (IMF) and concluded that, although the Fund produces some excellent research products, there was substantial room for improvement in the overall quality of the Fund's research (see IMF, 2000). Furthermore, the mix of research and the link between some of the Fund's research were not optimal. These conclusions were based on an in-depth evaluation of research output of the various departments of the Fund.

Like the IMF, most central banks engage in research activities. There are good reasons why they should. For one thing, central-bank governing councils require information and interpretations of economic situations on which to base their policy decisions. This type of research is mainly policy analysis. However, other types of research can also be helpful—or even essential—for a central bank. As the external examiners of the IMF put it: “Any organisation that relies on old ways of doing things in a changing world will eventually cease to be relevant. There is still much to learn in the field of economic policymaking, and [a central bank] must continue to learn and update its thinking” (IMF, 2000, p. 16).

This does not imply that a central bank should try to produce all the research that is relevant for its needs. Certain areas of research are better left to academia. Still, there are many good reasons why in-house research is essential for a central bank (see also IMF, 2000):

- Staff interested in doing research needs to be given the opportunity to conduct research so that a central bank can hire and retain the best economic minds.
- Research is more easily drawn into the process of policymaking when the same people that do research are also involved in the policymaking process of the central bank.
- Staff can gain an in-depth intuition from conducting their own research that can be called upon to help in the policy-design process.
- Successful in-house research can independently help enhance the credibility and reputation of the central bank.

From the perspective of a regional central bank in a decentralised system of central banks—like the European System of Central Banks—there are additional considerations (see Goodfriend, 1999; Angeloni, 1999).¹ The diversification of research within a system of central banks brings a variety of analytical perspectives to policy deliberations that are invaluable in an increasingly complex economy.² Moreover, a system of regional banks harnesses competitive forces to encourage innovative thinking within the central bank.

The aim of this paper is to provide an evaluation of the quantity and quality of the research activities of the central banks of the member countries of the European Union (EU). Quality of research has various dimensions. Research at the central bank can be

¹ See Eijffinger and de Haan (2000) for a comparison of the ESCB with the Federal Reserve and the Bundesbank.

² As Goodfriend (1999) points out, within the US Federal Reserve System, research departments of reserve banks often develop a specialisation. A reserve bank president may encourage research of one type or another; or a particular economist may make a department strong in a particular sort of research. A bank may also exploit a feature of its regional economy or its operational responsibilities to develop a research advantage.

considered of high quality when it proves to be useful in developing and executing policies of the central bank. This aspect of quality is difficult for outsiders to analyse. Instead, we focus on another indicator for research quality, i.e. whether the research papers have been published in refereed professional journals. In this note, we report the outcomes of an investigation based on the frequency of publications in international economics journals. The results are based on a survey of European central banks in which various questions related to research were asked.

Section 2 briefly outlines the survey and shows the evolution of the relative size of the research departments for the central banks for which this information is available. Section 3 reports research output in the form of absolute and relative numbers of publications in scientific international economic journals. The final section offers concluding comments.

2. Input: relative size of research departments

All EU central banks were sent a questionnaire in which we asked questions such as: What is the total number of staff employed by the central bank over the period 1990–1999? How many staff is working in the research department over the period 1990–1999? In which scientific journals did your staff publish papers over 1990–1999? Many, but not all central banks, were willing and able to answer these questions. The answers form the input for this and the following section. Appendix A provides the detailed questions.³

Table 1 shows the size of total staff and research staff of the central banks of the (member countries of the) European Union. The data refer to the average for 1990–1999 or for the period for which data are available (see notes to the table). Staff in the economics and research departments is counted as research staff. A few conclusions can be drawn. First, the absolute size of the European central banks varies considerably (see also Vaubel, 1997). Second, the central banks show considerable divergence in terms of the relative size of the research departments. The ECB has, by far, the highest ratio between researchers and other staff. This is, of course, a consequence of the fact that the ECB plays a key role in formulating monetary policy, while national central banks often have other responsibilities too, such as supervision of the financial system or data collection for statistical purposes. Of the large national central banks, the central banks of Spain and Portugal have the highest ratio between research staff and total staff and the central banks of Belgium and Italy have the lowest.

Fig. 1 presents the development of the ratio between research and total staff between 1990 and 1999. It shows that some banks increased the relative size of their research staff considerably (notably Sweden and the UK), while others show a more modest increase (Austria, Denmark, Finland, Germany and Greece). Portugal shows a decrease in the relative number of staff in research, which is, however, due to the fact that the

³ Some of the questions raised were answered by just a few central banks so that a meaningful comparison of the aspects raised in these questions was not possible. This holds, for example, for the number of staff having a PhD.

Table 1

The total size and size of the research departments, 1990–1999 (averages)

Central bank of	Total staff	Research staff	Ratio
Austria	1243	50	0.041
Belgium	2695	49	0.018
Denmark	582	33	0.057
Finland	826	45	0.055
France	NA	NA	NA
Germany	2761	69	0.025
Greece	3240	118	0.038
Ireland	621	23	0.037
Italy	9229	212	0.023
Luxembourg	141	22	0.156
Netherlands	1655	95	0.057
Portugal	1966	129	0.067
Spain	3175	253	0.080
Sweden	807	42	0.056
UK	4050	116	0.031
ECB	633	110	0.172

Data for Luxembourg and the ECB, refer to 1998–1999; data for Sweden, refer to 1992–1998. For Portugal, the data until 1996 include Statistics staff.

figures for 1990 up to 1996 include statistics staff. The Netherlands shows a small but steady decline, while in Belgium, Ireland and Italy, the relative size of the staff engaged in research remained more or less constant. The figures for the Spanish central bank suggest that both the research and the total staff remained the same during the 1990s (not shown in Fig. 1).

3. The research output

In this section, we look at the research output of the European central banks for the period 1990–1999. As pointed out in Section 1, we measure quality by counting the number of scientific journal publications per employee. Measuring output per employee seems natural as size of the various central banks differs a lot. As there exist considerable quality differences between scientific journals, we apply a weighting scheme. We ranked all international journals into three classes: top journal, very good journal and a good journal (see Appendix B for further details).⁴ A top publication delivers three points, a very good publication two points and a good publication one point. We calculated the research output per employee by multiplying the number of journal articles by the respective scores for the journal (either 3, 2 or 1) and dividing the resulting sum by the number of employees. The resulting research output per employee is shown in Table 2.

From Table 2, it becomes clear that the Bank of Finland has the best research performance of European central banks, closely followed by the Dutch central bank.

⁴ Only the journals in which central bank staff had published their papers are included.

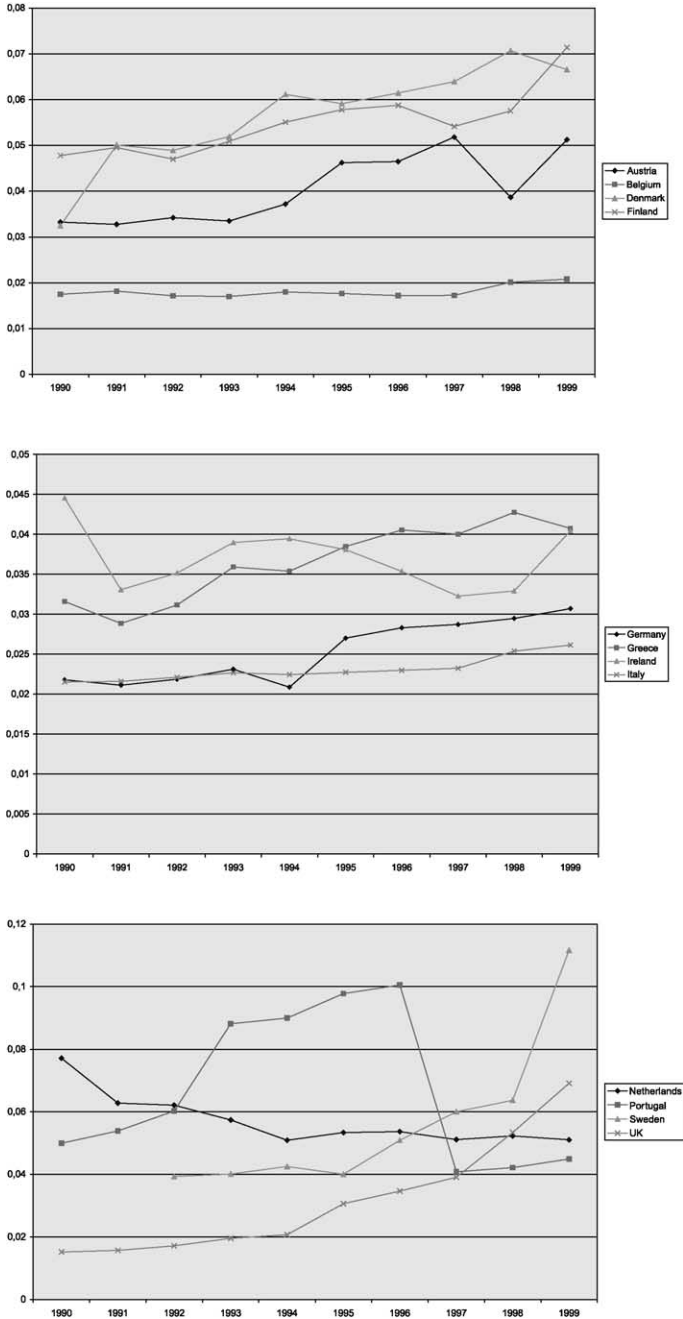


Fig. 1. Research staff as share of total central bank staff, 1990–1999.

Table 2

The weighted journal publications per employee of European central banks (including the ECB) for the period 1990–1999

Central bank of	Total number of journal publications	Quality-weighted number of articles	Quality-weighted number of articles per employee in research
Austria	14	17	0.34
Belgium	7	9	0.19
Denmark	3	5	0.15
Finland	20	35	0.78
France	NA	NA	NA
Germany	NA	NA	NA
Greece	NA	NA	NA
Ireland	3	4	0.17
Italy	7	19	0.09
Luxembourg	NA	NA	NA
Netherlands	49	68	0.72
Portugal	31	50	0.39
Spain	29	51	0.20
Sweden	5	12	0.24
UK	8	14	0.08
ECB (1994–1999)	29	50	0.45
ECB (1998–1999)	13	23	0.21

Figures for UK and Sweden, refer to 1998–1999. Figures for the ECB, refer to 1994–1999 or 1998–1999. In the first case, the publications of the ECB research staff during 1994–1997 were also counted.

The Finnish central bank has a very active research department with a relatively small staff who not only publish in international (top) journals but also, on a regular basis, organise high-level conferences with international research networks such as the National Bureau of Economic Research (NBER) and the Centre of Economic Policy Research (CEPR). Apparently, it pays off to have a clear strategy with respect to research. The second place goes to the Nederlandsche Bank. This primarily reflects the strong performance of its

Table 3

Rankings of central banks

Central bank of	Ranking relative size of research department	Ranking quality-weighted number of articles per employee in research
Austria	8	4
Belgium	12	8
Denmark	5	10
Finland	7	1
Ireland	9	9
Italy	11	11
Netherlands	4	2
Portugal	3	3
Spain	2	7
Sweden	6	5
UK	10	12
ECB (1998–1999)	1	6

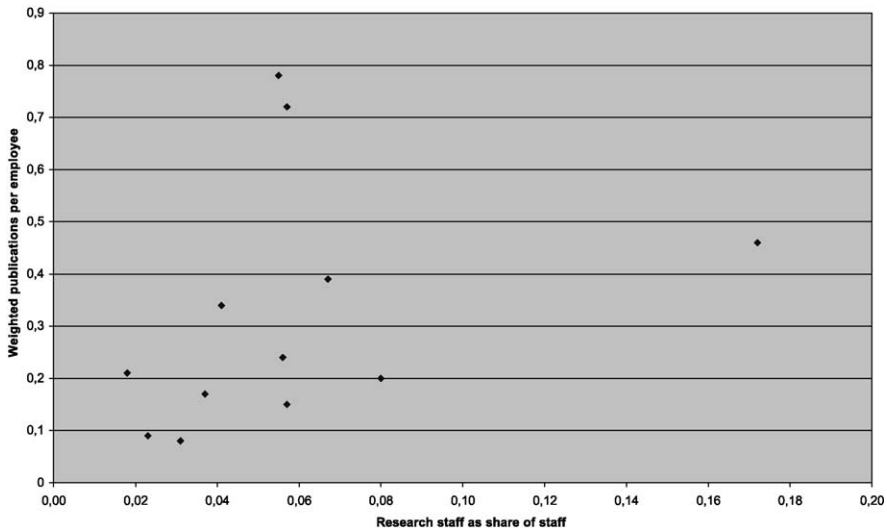


Fig. 2. Relation between research input and output.

research department. This part of the Bank has a strong tradition in applied econometric research and macroeconomic modelling. The third place is occupied by the central bank of Portugal, while the fourth place is for the Oesterreichische Nationalbank, which has built a niche with its research focus on central and eastern European countries. The fifth place is for the Swedish central bank, while the sixth place goes to the ECB in Frankfurt. However, when we also take the output over the period 1995–1998 into account, the ECB occupies the third place, before the Austrian and Portuguese central banks. This is a remarkable achievement. It is clear that the ECB invests a lot in attracting internationally reputed academics, especially for its *Directorat-General Research* but also for its *Directorat-General Economics*.

Is there a relationship between the relative priority that a central bank gives to research (i.e. the input) and the quality of research as measured by scientific publications (i.e. output)? Table 3 shows the rankings of the various central banks for which we have information on both input (relative size of the research department) and output (weighted number of publication per employee), while Fig. 2 shows a scatter diagram of the levels of the average input and the average output. It follows that there is only a weak relationship between input in terms of relative size of research staff and output in terms of international scientific publications.⁵ In other words, factors other than relative size of the research department determine the quality of the research output of central banks. It is quite remarkable that central banks of small countries (in terms of inhabitants) have such a relative good research performance. Possibly, there is an incentive for them to increase

⁵ This outcome seems in line with a theory of bureaucracy which predicts that larger bureaucratic structures will be less effective per person in producing output (see Niskanen, 1971).

their weight in the decision-making process through a reputation of high-quality research. An alternative factor that comes to mind is these central banks' general attitude towards openness and, hence, interaction with the national and international academic world.

4. Conclusions

In this note, we have analysed the research activities of the central banks in the European Union over the period 1990–1999 both in terms of input (research staff) and output (papers in international journals). The share of research staff in total staff of the national central banks varies between 0.02 and 0.16. The ECB has the highest ratio between researchers and other staff. A ranking of research performance based on the number of scientific papers per employee engaged with research reveals that the Bank of Finland has the best research performance of European central banks, closely followed by the Dutch central bank. There is only a weak relationship between the research performance and the share of research staff. The conclusion “small is beautiful” also seems to hold for the research departments of the European central banks.⁶

Appendix A. The survey

The following questions have been asked.

(1) What is the number of total staff members of your central bank in the past 10 years (1990–1999)?

(2) What is the number of staff of the Economics Department of your central bank in the past 10 years (1990–1999)?

(3) What is the number of staff of the Research Department of your central bank (if not incorporated in the Economics Department) in the past 10 years (1990–1999)?

(4) How many of the employees in the Economics and Research Departments have an academic degree and a PhD, respectively, in Economics (including Econometrics) and how many have a Master or PhD degree in another discipline (Business Management, Mathematics, Physics, History) during the past 10 years (1990–1999)?

(5) What is the number of academic articles published in refereed (international) journals during the past 10 years (1990–1999) and, if possible, in which journals were these articles published?

(6) What is the number of unpublished and published working papers and discussion papers during the past 10 years (1990–1999)?

(7) How many conferences and workshops did your central bank organise alone and in cooperation with academic institutions (universities, research institutes, CEPR, NBER, etc.) during the past 10 years (1990–1999)?

⁶ After we had finished our research, we also received information on scientific publications of the Swiss central bank, which confirms this conclusion.

Appendix B. The rating of journals*Top Journals:*

American Economic Review	Economic Journal
Journal of Business and Economic Statistics	Journal of Finance
Journal of Monetary Economics	Quarterly Journal of Economics

Very Good Journals:

Carnegie-Rochester Conference Series on Public Policy	Decision Support Systems
Econometric Reviews	Economic Inquiry
Economics Letters	Economic Modelling
Empirical Economics	Environment and Planning A
European Economic Review	European Journal of Political Economy
European Journal of Operational Research	International Review of Law and Economics
Journal of Applied Econometrics	Journal of Banking and Finance
Journal of Applied Economics	Journal of Comparative Economics
Journal of Business	Journal of Development Economics
Journal of Comparative Studies	Journal of International Economics
Journal of Economic Dynamics and Control	Journal of Labor Economics
Journal of International Money and Finance	Journal of Money, Credit and Banking
Journal of Macroeconomics	Kyklos
Journal of Policy Modelling	Public Choice
Oxford Economic Papers	Scandinavian Journal of Economics
Public Finance Review	

Good Journals:

Annales d'Economie et de Statistique	Applied Economic Letters
Applied Economics	Atlantic Economic Journal
BankArchiv	Current Issues in Economics and Finance
Economic and Financial Modelling	Economie Appliquee
Economic Policy: A European Forum	Environmental and Resource Economics
Empirica	European Journal of Finance
European Business Law Review	History of Political Economy
Finanzarchiv	International Finance
Industrial Relations	International Labour Review
International Journal of Social Economics	Journal of Economic Surveys
Journal of Cultural Economics	Journal of Forecasting
Journal of European Integration	Journal of Post Keynesian Economics
Journal of the Japanese and International Economics	Kredit und Kapital

Journal of Time Series Analysis

The Manchester School

Open Economies Review

Osteuropa-Wirtschaft

Quarterly Review-Banca Nazionale
del Lavoro

Scandinavian Economic History
Review

North American Journal of Economics
and Finance

Oxford Bulletin of Economics and
Statistics

Weltwirtschaftliches Archiv/Review of
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