How good is the forecasting performance of major institutions?

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Most forecasters did not predict the increase in growth and reduction in inflation in some of the world's leading economies during the second half of the 1990s and the recent downturn also caught many wrong footed. In this article we discuss the forecasting performance of major institutions using a uniquely extensive database covering the period 1991–2000. Altogether we have about 52 000 forecasts for real GDP and inflation from about 250 institutions. The countries included are the US, Japan, France, Germany, Italy and Sweden.

Introduction

Most business and investment decisions are based on forecasts for the outlook of the economy. Models of household and financial markets also often include forward-looking behaviour; inflation-targeting central banks use forecasts as a basis for policy decisions. Some recent literature argues that many of the policy mistakes in last few decades were due to poor forecasts.[1] Against this background it is evident that an evaluation of forecasting performance is both important and necessary. The past decade is a case in point. The late 1990s was a period of exceptionally strong performance for the economies of many industrialised nations. But was the performance of the economists who were set to forecast these developments equally exceptional? Which of those forecasters were most accurate?

In this article we evaluate forecasts during the 1990s. There have been sever-

* We would like to thank Maria Wahl and Fredrik Åkerlind for research assistance. We owe a special debt of gratitude to Robert Wiklund without whose help in constructing the database this project would not have been possible. We would also like to thank Anders Vredin for comments on an earlier draft and Gordon Richards.

[1] Orphanides (1999).

al such studies during recent years,[2] but our evaluation is unique in its size and comprehensiveness. Other studies typically focus on a few selected forecasters, some particular institutions or countries. By contrast, our study encompasses a database of about 52 000 forecasts for real GDP and inflation made by major institutions in the Consensus Forecasts' selection of leading forecasters from 1991 to 2000 for five leading economies – the United States, Japan, Germany, France and Italy – as well as for Sweden. To these we have added the forecasts of the OECD and the IMF. All in all about 250 institutions are included in the database (see table A1 in the appendix).[3]

This evaluation of forecasting performance is unique in its size and comprehensiveness.

The forecasters have been evaluated on the magnitude of error in the forecast according to their root mean square error (RMSE). This measure is based on the square of the forecast errors and is a fairly standard evaluation tool for forecasts. We also evaluate the forecasters using the mean prediction error (MPE). This measure is a simple average of the forecasting errors and hence should be close to zero over a longer time-period in order for a forecast to be unbiased. The forecasts have also been evaluated at different points during the year to assess the pattern of forecast revisions. The methods used for the evaluation, as well as analyses of individual countries, are detailed in appendices A and B. In the main text, we focus on common patterns of forecasting performance across countries.

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Growth is more difficult to forecast than inflation

The common denominator for all but one of the countries included in this study is that it has been more difficult to predict growth than inflation during the analysed time span. This can be seen from tables 1 and 2. For the United States, the forecasting error for forecasts of growth one year ahead was on average 1.2 percentage points (ranging from 0.7 to 1.5 percentage points) but for inflation

[2] See for example Batchelor (1997), Diebold, Tay & Wallis (1997), Glück, Schleicher & Catena (2000), IMF (2001), Keereman (1999), Thomas & Grant (2000) and Öller & Barrot (2000).

[3] The Riksbank is not included in the evaluation of forecasters. The main reason for this is that the Riksbank's forecasts, unlike those of the other institutions, are conditioned on the assumption of an unchanged repo rate, in order to serve as an effective instrument for monetary policy. However separate evaluations have been made of the Riksbank's forecasts, taking into account this particular assumption (Jansson & Vredin 2000).

only on average about 0.5 percentage points (ranging from 0.3 to 0.8 percentage points).[4] A similar difference between the accuracy of growth and inflation forecasts is observed in the other four major economies included in the analysis. The notable exception is Sweden, where the errors in the forecasts for inflation and growth are similar (about 1 percentage point in both cases).

Table 1. Average root mean square (RMSE) GDP, current year, January

	US	Japan	France	Germany	Italy	Sweden	Mean
1991	0.63		1.28	2.04	0.49		1.11
1992	1.61	1.56	0.76	0.65	0.92		1.10
1993	0.35	1.92	2.26	1.22	1.62		1.47
1994	0.99	0.90	0.97	2.34	0.82		1.20
1995	0.48	0.87	1.12	1.44	0.16	1.57	0.94
1996	1.00	3.09	0.60	0.42	1.34	0.91	1.22
1997	2.02	0.67	0.31	0.24	0.81	0.74	0.80
1998	1.84	2.79	0.66	0.19	0.50	0.48	1.08
1999	1.81	1.40	1.03	0.34	0.29	2.08	1.16
2000	1.39	1.20	0.33	0.38	0.58	0.34	0.70
Mean	1.21	1.60	0.93	0.93	0.75	1.02	1.07

Note. These RMSE are an average of the forecasters included in the consensus survey.

Table 2. Average root mean square (RMSE) CPI, current year, January

	US	Japan	France	Germany	Italy	Sweden	Mean
1991	0.67		0.40	0.26	0.39		0.43
1992	0.51	0.57	0.78	1.24	0.24		0.67
1993	0.32	0.53	0.54	0.71	1.17		0.65
1994	0.44	0.25	0.43	0.30	0.57		0.40
1995	0.55	0.78	0.26	0.67	1.33	1.04	0.77
1996	0.31	0.21	0.24	0.44	0.50	1.71	0.57
1997	0.71	0.64	0.34	0.30	0.77	0.42	0.53
1998	0.80	0.37	0.68	1.22	0.20	1.66	0.82
1999	0.31	0.38	0.24	0.43	0.40	0.25	0.34
2000	0.83	0.59	0.82	0.54	0.69	0.35	0.64
Mean	0.55	0.48	0.47	0.61	0.62	0.91	0.61

Note. These RMSE are an average of the forecasters included in the consensus survey.

One possible explanation for the greater ease in foreseeing inflation than growth is related to the new role for central banks: the monetary policy authorities in the six countries surveyed have adopted policies aimed towards price stability during the 1990s. Some of these countries' central banks have introduced explicit inflation targets, such as Sveriges Riksbank[5] for Sweden. Other countries have had

[4] For more details about the institutions' RMSE (see appendices). Note that the range excludes the random walk.

[5] According to Jansson & Vredin (2000) the forecasting error of the Riksbank's own projections one year ahead of the year in question was, according to the RMSE method, 1.4 for inflation and 1.1 for growth. The forecast for two years ahead of the year in question was 2.4 for inflation and 1.0 for growth. Even if these forecasts cannot be compared to those of other forecasters in this paper due to the assumption of a constant repo rate, they nevertheless indicate that the Riksbank, like other forecasters, has not been more successful in predicting inflation than growth in the Swedish economy.

more or less explicit inflation targets (including, in the case of Germany, France and Italy, the Maastricht criterion on inflation prior to EMU entry) all of which have been specifically aimed at anchoring inflation expectations in the economy. Many central banks have also been given increased independence and accountability in the conduct of monetary policy.

Another possible explanation is that GDP is simply harder to forecast as such. GDP comprises much more input than price indices like the CPI. Moreover, GDP-data is often revised, which is rarely the case for CPI. Sometimes, GDP-revisions can be quite large, for instance US GDP growth for 2000 was revised down in 2001 by almost one percentage point.

Forecasting performance does not follow the same pattern across countries despite a globalised economy

We find no clear correlation pattern for GDP forecast errors across countries.

Are there any patterns between countries discernible from tables 1 and 2? In an increasingly integrated world economy, one might expect the forecasting errors to be contemporaneously correlated across countries. For example, large forecasting errors in the US might lead to worse forecasts for other OECD countries via trade effects. We find no such clear pattern for GDP forecasts. In particular, the RMSE of US GDP forecasts (displayed in table 1) is negatively correlated with all countries included in our analysis. The other countries included, however, are all positively correlated with their average. One way these patterns could arise is if the errors in US GDP forecasts are due to underestimating the "new economy" and that "new economy" spreads with a lag and with less strong effects to other economies.

The picture is different for CPI forecasts. All countries except Italy and Sweden consistently have positively correlated RMSE. One possible explanation is the common trend towards lower inflation in several OECD countries mentioned above. Admittedly, Sweden has been a part of this trend and it would therefore be expected that forecasters would similarly have reduced their forecasting error. One potential explanation why this is not the case is the Swedish track record of above average inflation in the OECD for the 1970s and 1980s, perhaps giving rise to longer time for the low inflation regime to gain credibility.

Inflation is overestimated and growth underestimated

Inflation has been repeatedly overestimated while half of the countries display an average underestimation of GDP.

Are there any systematic patterns in the forecasting errors across countries? Inflation has been repeatedly overestimated in several countries to different degrees (see table 3). On averaging across institutions' forecasts, no country in our analysis displays a downward bias for inflation forecasts. The picture is more mixed for growth. Half of the countries display an average underestimation of GDP by most analysts. The most apparent example is the U.S. (see figure 1), where the MPE is –0.9 percentage points, i.e. an average downward bias in growth forecasts. The MPE for US inflation is 0.3 percentage points, implying that inflation by contrast has been overestimated.[6] The figures show similar unequivocal biases for Sweden. Japan has close to unbiased forecasts for both GDP and inflation; France and Italy have both an upward bias in GDP forecasts, whereas Germany has a downward bias.

Table 3. Average mean prediction error (MPE) across institutions

	US	Japan	France	Germany	Italy	Sweden
CPI	0.3	0.1	0.2	0	0	0.8
GDP	–0.9	0	0.3	–0.3	0.3	–0.4

Note. This diagram is based on the MPE for forecasts made in January for the current year. For unbiased forecasts, the MPE should be close to zero.

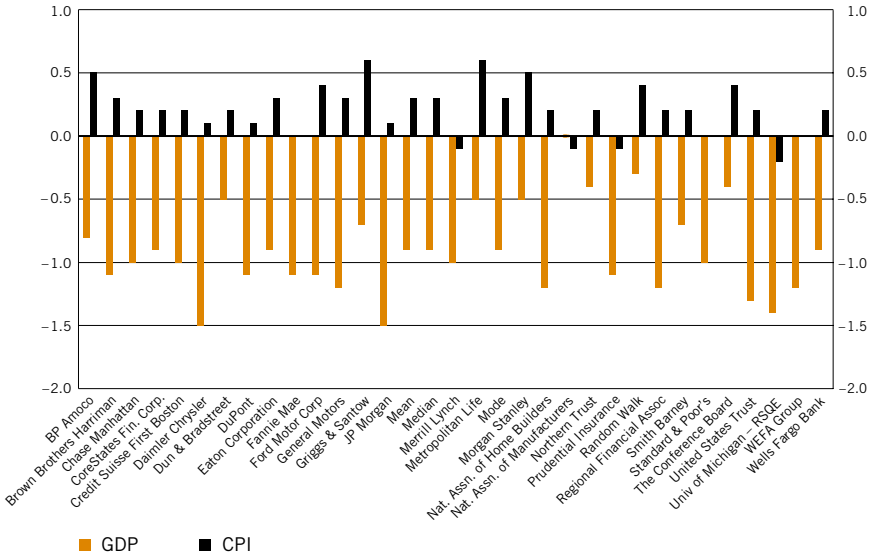
Forecasters have had problems in identifying important structural changes.

A possible explanation for those biases in the forecasts in the 1990s is that forecasters have had problems in identifying important structural changes. The United States was in the latter part of the 1990s characterised by a marked increase in productivity that many analysts have associated with information and communication technologies. This productivity rise did not occur in continental Europe[7], whereas Sweden may have been an exception. For both Sweden and the US, forecasters may have been slow to recognise these structural changes. Meanwhile in Japan, France and Italy structural problems have characterised most of the 1990s and their lesser productivity record has left them trailing behind during the American growth

[6] This finding is similar to Diebold, Tay & Wallis (1997). They find a pattern of forecasters tending to overpredict the probability of negative inflation shocks.
[7] See Eriksson & Ådahl (2000).

Figure 1. Mean prediction error (MPE) for US GDP, 1991–2000

January, current year



Note. This diagram is based on the MPE for forecasts made in January for the current year. For unbiased forecasts, the MPE should be close to zero.

Source: Consensus Forecasts.

acceleration. These structural problems may have contributed to the underestimation by many forecasters.

An indication of this is given by the average RMSE of forecasters for each year in each country (see tables 1 and 2). In the US the three first "new economy" years of 1997, 1998 and 1999 were the ones with the largest error on GDP and for 1997–98 the largest error also for inflation. In Sweden the years 1995 and 1999, both years of strong productivity growth, were the worst in terms of GDP forecasts. For Japan, the only clear pattern for GDP forecasts errors is that they are much larger than for other countries. This is probably related to the early expectations of a short-lived Japanese crisis that turned out to be wrong, as growth has been close to a standstill during the 1990s.

Hard to predict turning points

Another issue that has vexed forecasters is the ability to predict turning points in the cyclical growth of the economy. This issue has been topical not least during the unprecedented growth expansion of the US economy in the 1990s. From the biases discussed in the previous section it is clear that many forecasters were sur-

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prised by the upturn in US growth during the 1990s. Many had been predicting a downturn or at least a return to more historical levels of growth. When the upturn was eventually identified its magnitude was generally underestimated.

Now that a downturn has occurred in the US towards the end of 2000 and continued during the first two quarters of 2001, how accurate have forecasters been in predicting this slowdown? As we do not have the final figures for 2001 we can only make some conjectures based on forecast revisions from autumn 2000 to mid-year 2001. Most forecasts for US GDP growth in 2001 in the autumn of 2000 were about 1 to 2 percentage points higher than the forecasts during the spring of 2001.[8] In other words, the majority of forecasters did not identify the downturn of the US economy until after it had begun. One notable exception is DuPont, which was one of the first to significantly revise its forecast for 2001 downwards in the late autumn of 2000: from 3.3 per cent in September to 2.5 per cent in October. Others were slower to follow.

For Japan and Italy the track record is even worse, with most forecasters missing both the turning points and their amplitudes.

Herd behaviour

Forecasters are sometimes suspected of herd behaviour. The precise definition of herd behaviour may be somewhat unclear, but intuitively it is taken to be "undue" influence on an institution's forecast by the collective view (see for example chapter 8 in Shiller (2000)). One unkind interpretation of herd behaviour is that of individual forecasters not daring to go against the mainstream or venturing very far from the average of other forecasters. This might arise, for example, if there is less stigma associated with being wrong if everyone else is wrong too.

It is also the case, however, that herd behaviour may arise from quite "legitimate" reasons, such as the incoming data unequivocally pointing in one direction. Moreover, if forecasters use the same foundations from economic theory, one would expect new information to affect forecast revisions in similar ways. Thus, there are different theories of behaviour that can give rise to the same pat-

[8] The mean forecast for 2001 went from 3.6 in October 2000 to 1.8 in June 2001.

terns in data. As a result, from an empirical point of view it may be hard to test the merits of competing explanations.

Our results are consistent with what one would expect if there were herd behaviour, but in light of the above empirical issue, it is beyond the scope of our survey to attribute this to some particular explanation. Figure 2 shows the correlation for the US between the revision in the institution's GDP forecast and the revision in the consensus mean (representing the "collective"). This correlation is calculated for January-March, March-May, and June-October. The diagram shows a high degree of correlation for almost all forecasters. Table 4 shows that the same pattern of correlation holds for other countries to varying degrees. Overall, our results indicate some support for the presence of herd behaviour.

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It appears that the forecasters make the same mistake initially and then follow the same revision path (see figure 3). Even in countries with large fundamental changes during a longer period of time, such as the high growth in the US, the forecasters have often been systematically wrong in the same direction.

Which forecasters perform best?

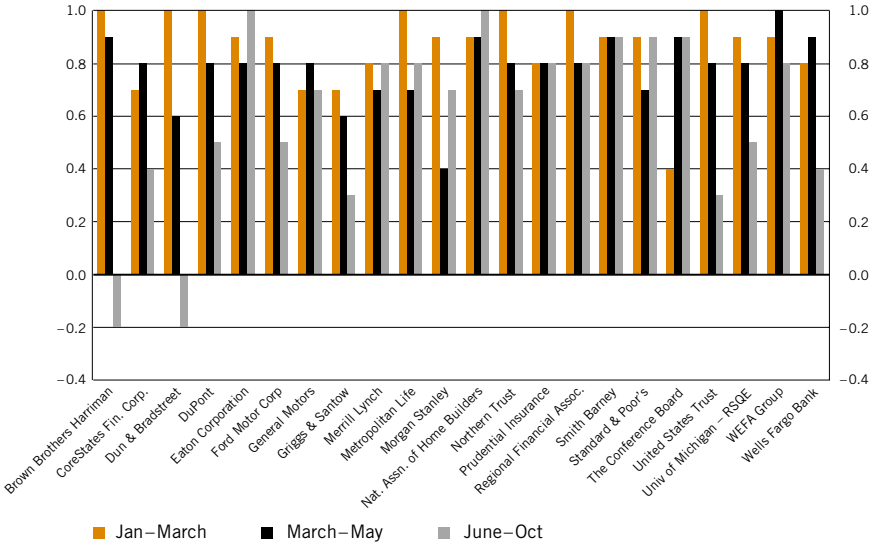
There is no obvious common denominator for those forecasters that have performed best during the 1990s according to this survey but some conclusions can be drawn.

The most renowned forecasters do not necessarily make the best forecasts

For most of the countries in this survey it is not the most renowned institutions that are the top performers in forecasting. Indeed it is often rather anonymous and less known banks or associations that top the ranking (see the appendix for a more detailed discussion of how well different institutions performed).

Amongst the forecasters in the US included in our survey during almost the whole period, DuPont is one of the very best performers. For those institutions that were included up to the mid-nineties the National Association of Manufacturers followed by Dun & Bradstreet, performed best. Is it the case that forecasters closely linked to the manufacturing industry produce better forecasts? One way this could occur is if disaggregated business data gave valuable information

Figure 2. Correlation between revision in forecast and revision in consensus mean, US GDP



Source: Consensus Forecasts.

Table 4. Percentile distribution of forecasters for correlation with mean

	CPI				GDP			
	<0	0–0.25	0.25–0.75	0.75–1.00	<0	0–0.25	0.25–0.75	0.75–1.00
US	0.05	0.14	0.67	0.14	0.00	0.00	0.18	0.82
Japan	0.40	0.00	0.30	0.30	0.18	0.09	0.46	0.27
France	0.11	0.00	0.56	0.33	0.00	0.06	0.23	0.71
Germany	0.00	0.13	0.48	0.39	0.00	0.05	0.33	0.62
Italy	0.00	0.00	0.22	0.78	0.11	0.11	0.56	0.22
Sweden	0.40	0.00	0.40	0.20	0.00	0.00	0.80	0.20
Average	0.16	0.04	0.44	0.36	0.05	0.05	0.43	0.47

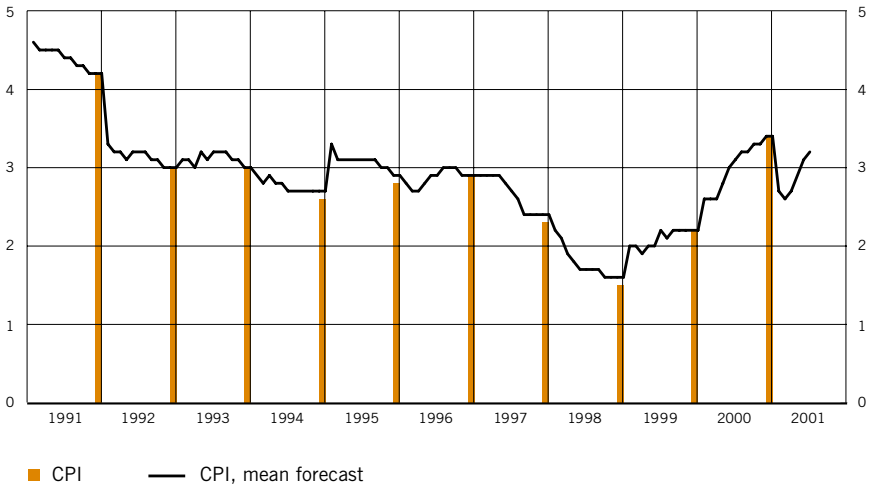
Note. The table shows the percentage of the institutions' forecasts falling within a specified range of correlation with the revision in mean. The revision analysed is the change in forecast from January to March. For example, the first column shows the per cent of institutions' forecast revisions that have negative correlation (or are uncorrelated) with the revision in the mean. Note that some percentile ranges have few observations and the results should be interpreted with caution.

about aggregate movements. This does not appear to be the case, however, possibly due to the large noise component in firm level data.[9]

The most prestigious national and international institutions often achieve top positions but by no means dominate the ranking, where many rather more anonymous forecasters achieve prominent positions. For example, in Japan inter-

[9] We are grateful to Gordon Richards, formerly at the National Association of Manufacturers, for pointing this out.

Figure 3. Revision of consensus mean for US CPI



Source: Consensus Forecasts.

national banks JP Morgan and Merrill Lynch are amongst the best on both CPI and GDP, but the Tokai Bank has better GDP forecasts and the mean is the best overall trade-off between inflation and GDP; in Sweden, Öhmans has a superior forecasting performance compared to the more well known banks, such as Nordbanken and Handelsbanken.

Many rather more anonymous forecasters achieve prominent positions.

The IMF and the OECD are in general below average

The two leading forecasters among the international institutions, the IMF and the OECD, have been included in this survey for a direct comparison to the private institutions. Their ranking is displayed in table 5. Both the IMF and the OECD have only two forecasts per annum for the major industrialised economies, one in autumn/winter and one in spring/summer compared to the monthly (or quarterly) assessments of the private institutions. In all six countries studied they have both fared considerably worse than the mean. For example, the IMF and the OECD are among the worst forecasters for Sweden. Our results thus indicate that the prominent role as forecasters often accorded to the IMF and the OECD in the media may be unwarranted. In particular, the consensus mean is much better. This finding is similar to Batchelor (1997).

What might explain this finding? Both the IMF and the OECD have long

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forecasting rounds often involving some interaction with their member states. Although updates are made ahead of publication, these procedures may potentially delay the timely response to new data and information. Nonetheless, it is somewhat surprising that organisations renowned for the high calibre of their economic analysis do not have better forecasts. It is also the case, however, that both organisations provide more than just forecasts. In their publications several other important issues concerning the world economy are also discussed, such as structural impediments, risks and policy recommendations to name a few.

Table 5. Per cent of institutions with better forecasts than selected institutions

	CPI						
	US	Japan	France	Germany	Italy	Sweden	Mean
IMF	0.82	0.91	0.44	0.39	0.83	0.93	0.72
OECD							
Mean	0.26	0.23	0.32	0.33	0.17	0.73	0.34
Random walk	1.00	1.00	0.96	1.00	1.00	1.00	0.99
JP Morgan	0.63	0.05	0.56	0.03		0.27	0.31

	GDP						
	US	Japan	France	Germany	Italy	Sweden	Mean
IMF	0.68	0.67	0.73	0.68	0.84	0.75	0.73
OECD	0.74	0.50	0.54	0.56	0.63	0.88	0.64
Mean	0.26	0.08	0.23	0.26	0.21	0.63	0.28
Random walk	1.00	1.00	1.00	1.00	1.00	1.00	1.00
JP Morgan	0.50	0.25	0.04	0.15		0.56	0.30

Note. In the appendix each institution is given a rank based on relative forecasting performance. The percentile rank in the table is obtained by dividing the institutions' absolute rank by the total included. For Italy, however, JP Morgan was excluded from the survey as having too few observations (see apendix A1 for an explanation). Also, the OECD was excluded from CPI forecasts since they make GDP-deflator (rather than CPI-inflation) forecasts. The best forecasters are close to percentile zero, the worst close to percentile one.

The average, the median and the mode of forecast are rarely the best but display a stable reliable performance

The consensus mean has a stable and reliable performance.

One of the assumptions sometimes made about surveys of forecasters, such as that of Consensus Forecasts, is that the average of a number of individual forecasters will yield a better estimate by smoothing out individual mistakes. Surveys are also often used by news agencies when comparing statistics with market expectations. As discussed above, there is a risk that

forecasters are biased in the same direction. Nevertheless, the forecasts reviewed here show that using the consensus mean may be a sound strategy. It is a fairly safe bet: rarely the best but displaying a stable reliable performance (see table 5).

The exceptions in this study are Italy and Japan, where the mean of the forecasts is among the best. This could be a sign that the very poor statistics in Japan (often revised drastically and thus giving a potentially faulty short-term view) during the 1990s crisis have given pre-eminence to the collection of anecdotal evidence. Such pieces of information may be more evenly spread within the group of forecasters, making the average a good compounded indicator.

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Forecasters are generally superior to a random walk

Almost all forecasters in all the surveyed countries remain superior to a random walk without drift, included here for comparison. The only exception is France where one forecaster is ranked lower than the random walk.

Point estimates and forecast distributions

In this paper we have compared the point forecasts to the actual outcomes. This is a fairly standard procedure for evaluating forecasting performance. But perhaps institutions should also be assessed on their overall picture for the outlook of the economy? For example, do the forecasts make sense with respect to economic history? Are the revisions in forecasts consistent with economic theory? Although clearly useful and important, such assessments are necessarily more subjective than comparing point forecasts.

One step in the direction of more overall assessments but with clearer criteria is to evaluate forecast distributions rather than point estimates, as argued in Tay & Wallis (2000). A distribution contains information about variance, skewness (upside or downside risk) and other important features of the forecast. For example, some central banks, including the Bank of England and Sveriges Riksbank publish uncertainty intervals for their inflation forecasts derived from statistical distributions (see Britton, Fischer & Whitely (1998) and Blix & Sellin (1998, 1999 and 2000)). Some private forecasters have been evaluated in this way (see Diebold, Tay & Wallis (1999)). Nonetheless, most forecasters only make point predictions. But just as food products often contain information about ingredients to aid consumer choice, publishing forecast distributions may provide crucial infor-

mation for decision-makers. For example, a forecast that is more uncertain than "usual" may be an argument for delaying a decision.

Conclusions

Forecasters appear to have had much greater difficulty in assessing growth than inflation during the last decade. In the US and Sweden there has also been a general overestimation of inflation and underestimation of growth. There are indications in several countries that forecasters have been unable to identify structural changes in growth patterns even after prolonged periods of time. There is also some evidence of herd behaviour amongst forecasters, with a tendency to follow the same revision patterns. But this pattern can arise from quite "legitimate" reasons as well, although it is beyond the scope of this study to determine which explanation has more merit.

For Japan and Italy, the averages of the forecasts are better than most individual forecasters. For other countries surveyed, the average provides a stable and reliable but by no means superior performance. Some forecasters that dare go against the mainstream can perform systematically better than the average view. In ranking the forecasters, however, it is important to remember that there is no guarantee that a track record of superior forecasts necessarily means that this state of affairs will continue.

Overall, we find that it is often the less renowned forecasters that perform best, while those that are often accorded considerable weight in the media, such as the IMF and the OECD rank amongst the less successful forecasters. This points to the need of regularly assessing the forecasting performance of institutions. Only in this way will forecasters' influence in the public domain stand in proportion to the quality of their assessments.

Appendix A1. The data

The data used in this paper is obtained from Consensus Forecasts Inc. Every month from 1991, Consensus Forecasts surveys a large number of institutions and collects their forecasts for several variables. Some of these are: budget deficit, car sales, CPI, corporate profits, current account, GDP, housing starts, industrial production, investment, private consumption, producer prices, unemployment rate, wages, 3-month interest rate and 10 year government bond yield. The data set is fairly large and we have selected to focus on real GDP and inflation (see table A1 for details of number of observations and institutions included). In the paper, we refer to "current year forecast" referring to all forecasts for a particular calendar year that are made with less than 12 months left to go for that year; "next year forecast" refers to forecasts for the coming year with 12–24 months left to go.[10]

Consensus Forecasts reports a mean forecast for each variable and each period. This is the forecast that is usually referred to as the "consensus view" and is often reported in the media. We also calculate a mean from our data, but it may differ slightly from the consensus mean, as we also include the IMF and the OECD. For all practical purposes, however, this difference should be negligible.

For actual GDP and inflation, we use OECD's Economic Outlook (2000).

Table A1. Number of observations and institutions

	Number of observations				Number of institutions			
	GDP		Inflation		GDP		Inflation	
	Current	Next	Current	Next	Current	Next	Current	Next
US	3 100	3 140	3 234	3 110	59	59	58	58
Japan	2 325	1 782	2 296	1 756	48	48	46	46
France	2 260	2 035	2 232	2 004	37	37	36	36
Germany	3 300	3 130	3 331	3 171	47	47	46	46
Italy	1 620	1 540	1 593	1 510	39	39	38	38
Sweden	939	922	916	900	28	28	27	27
Total	**13 544**	**12 549**	**13 602**	**12 451**	**258**	**258**	**251**	**251**

Note.These numbers exclude the random walk, the mean, the median and the mode. Since the participation rate of the institutions varies greatly over time, it is not meaningful to divide the number of observations by the number of institutions. Current refers to forecast made within the year (i.e. less than twelve months left before the close of the calendar year) and next refers to forecasts made for the following year (i.e. 12–24 months) left before the close of the next calendar year).

[10] For example, a forecast in January 1999 for the year 1999 will be termed "current year forecast", whereas a forecast made in December 1998 for the year 1999 will be termed "next year forecast".

Appendix A2. A note on the method used

Any evaluation where performance is measured in more than one dimension needs to address the issue of a weighting scheme. There are of course many ways in which this can be done. Taking simple averages over all dimensions or taking averages over relative rank in different dimensions are examples of two possible approaches.

Whatever method used, it needs to be suited to the particular application at hand. In this evaluation, there are several features of the data that dictate our choice of method. First, the dimensions of interest are all measured in the same units, i.e. percentage points. Second, there are twelve different evaluation periods, six for within-year forecasts and six for next-year forecasts, i.e. twelve dimensions; both within-year and next-year evaluations are done in January, March, May, June, October and December. The latter four months are partly chosen so that both the IMF and the OECD can be included. Third, the number of institutions that are included varies for each evaluation period: some institutions are included all the time, some only a few times. Fourth, institutions sometimes disappear or change names within the Consensus Forecasts survey. This reflects any number of events, such as one bank being merged with another to the more trivial change of name.

Apart from these characteristics, our evaluation is based on the assumption that evaluating an institution over a long period of time is a valuable exercise. One limiting factor, for example, is that a good or bad forecasting performance within an institution may be linked to a specific person or to certain individuals rather than reflect the institution itself. Moreover, the forecasting record is not independent of the macroeconomic situation. An evaluation that includes several turning points in the business cycle may give quite different results than one that only includes periods of high growth. Despite these issues, our evaluation sometimes points to institutions that have consistently done well or badly.

Another assumption is that it is useful to compare forecasts made in a particular month, say March in one year, with other "March forecasts". For example, the forecast made in March 1991 will be compared to the outcome 1991, the forecast done in March 1992 will be compared to the outcome 1992 and so on. The assumption is thus that a forecast made in a particular month of the year is in some sense based on the same type of information set. The important aspect for us is that there should not be an obvious time advantage, i.e. in the time dimension the playing field should be level.

The method we have chosen includes two filters for determining whether an

institution should be included or not. The motivation for applying these filters is to reduce the uncertainty in the resulting ranking. They are applied to prevent a few superior or very poor forecasts from some institution from unduly influencing the ranking. The inevitable cost is that some information is omitted.

The first filter excludes all institutions that have less than five forecasts in a given evaluation period. For example, an institution that has four current-year forecasts in the Consensus Survey (say in January: 1993-1996) would be excluded, but if the same institution had five forecasts for another month (say in March: 1994-1998) it would be included in that month instead. We have chosen this cut off point as a trade-off between the number of institutions included and the uncertainty of the results. It is essentially a choice dictated by degrees of freedom. Since the data is from 1991-2000, we have at most ten observations for each evaluation month.

The second filter excludes all institutions that are included in fewer than four evaluation periods. For example, an institution that is included in the evaluation months of January, March and May will be excluded from the overall evaluation. If it had one more month included, say October, it would be included in the overall evaluation. This filter is imposed to prevent an institution that is a top forecaster in a few evaluation periods from dominating the results. This is of course arbitrary to some extent, but without this filter those that are included in almost all twelve periods might be at a disadvantage relative to those that partake say only in months where the average RMSE is low.

After applying the two above-mentioned filters, how is the ranking obtained? Our ranking scheme is based on average relative rank over all evaluation periods. This is done in the following way. For all institutions included in a given month we assign a relative rank based on their RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average RMSE and the average relative rank over all evaluation periods. This is done for both GDP and inflation. The average relative rank is then plotted in diagrams with CPI on one axis and GDP on the other. The best overall forecasters for GDP and inflation are in the lower left-hand corner of the diagrams.

The average relative ranks are displayed in the tables. These relative ranks are also transformed to absolute ranks to make the table more readable. For example, suppose there are three institutions that have relative ranks 1.3, 2.6 and 10.4. These would be displayed in scale in the diagram, but are displayed in the table as rank 1, 2 and 3. We also display the average RMSE.

In some instances a ranking based on average relative rank (our scheme) and

one based on average RMSE give different answers. Often when this occurs, we will make a comment in the text explaining the reason(s).

In the diagrams, we only include those that are ranked for both GDP and inflation. This excludes, for example, the OECD from all diagrams, as the OECD forecasts the GDP-deflator rather than the CPI. But (having passed the two filters) institutions that are ranked for only either GDP or inflation are included in the tables.

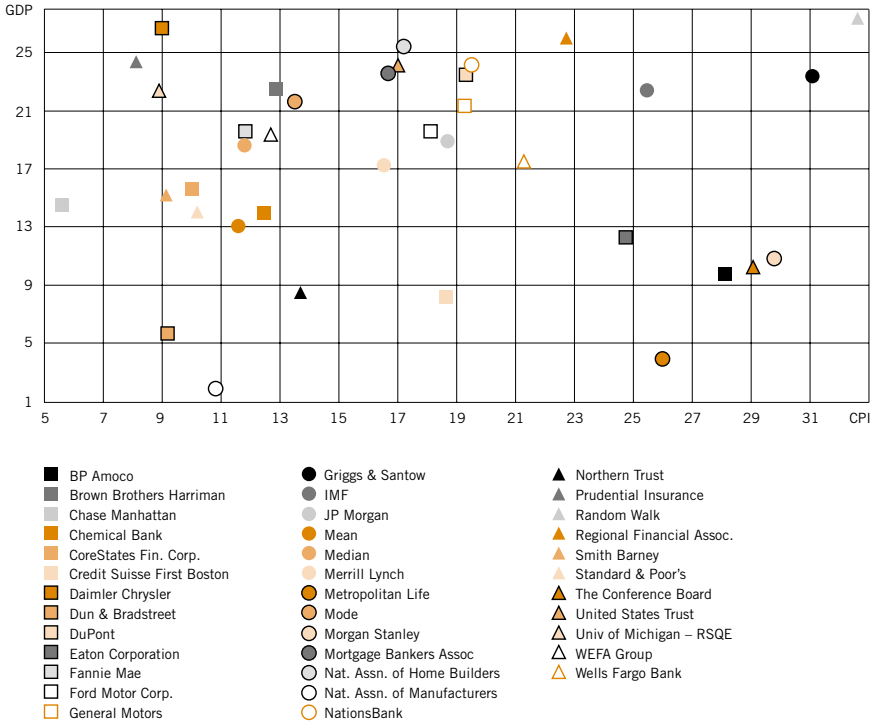
Appendix B. USA

Table B1 shows that the top ten inflation forecasters for the US have very similar RMSE, differing by only a few hundred percentage points. The most highly ranked is Chase Manhattan, closely followed by Prudential Insurance, University of Michigan – RSQE, Daimler Chrysler, Smith Barney and Dun & Bradstreet. The National Association of Manufacturers is among the top ten and, in fact, has the lowest RMSE. On the basis of RMSE , it would be ranked first. It has the best RMSE in four out of the nine evaluations in which it is included according to our criteria (specified in appendix A2) , but in the other five evaluations it does slightly worse. For example it is ranked number fifteen for current-year January forecasts. This shift in ranking is probably a reflection of the strong competition among top inflation forecasters.

For GDP-forecasts, the picture is different. As can be seen from both figure B1 and table B1, the top ten GDP forecasters are not clustered close together. By far the best GDP-forecaster is the National Association of Manufacturers – both in terms of relative rank and in terms of RMSE. The next best forecaster, Metropolitan Life, has an almost 0.2 percentage points higher RMSE; the tenth best, the mean, is about 0.6 percentage points higher. Other top forecasters are Dun & Bradstreet and Credit Suisse First Boston.

With regard to both GDP and inflation, two forecasters stand out from the rest: the National Association of Manufacturers and Dun & Bradstreet. Overall, the National Association of Manufacturers is judged to be the best forecaster. It should be noted, however, that the National Association of Manufacturers has been excluded from the Consensus Survey since 1995 and Dun & Bradstreet since 1997.

Figure B1. Average relative rank, 1991–2000, US, GDP and CPI



Note. The diagram is constructed as follows. Each institution included in a given month is assigned a relative rank based on RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average relative rank over all 12 evaluation periods (see appendix A for details). The best forecasters for GDP and inflation in the sense of best relative rank are in the lower left of the diagram.

Source: Consensus Forecasts.

Table B1. Average RMSE for the US 1991–2000

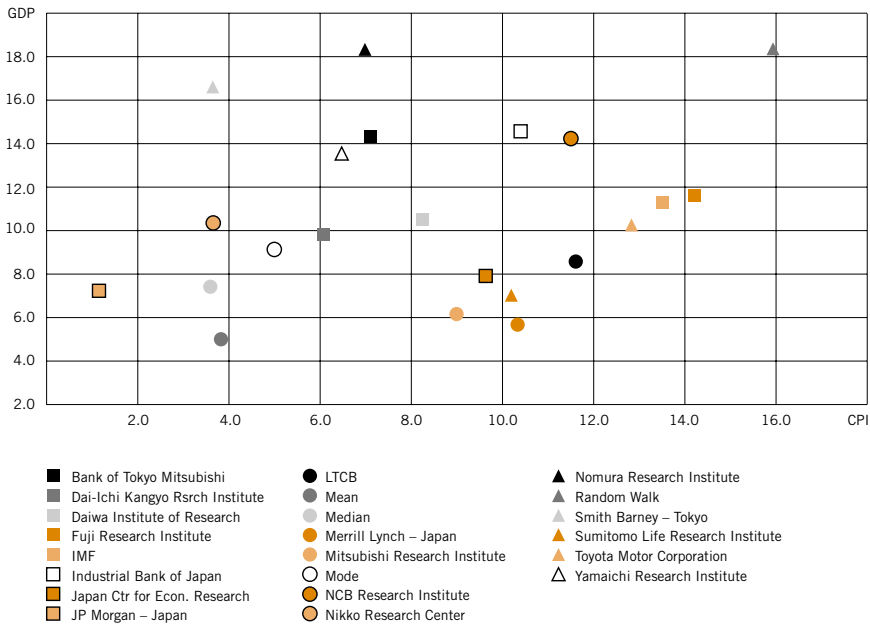
Institution	CPI RMSE	CPI rank	GDP RMSE	GDP rank	Average CPI Rank	Average GDP Rank
Bankers Trust	0.66	32			25.5	
BP Amoco	0.74	34	1.06	6	28.1	9.9
Brown Brothers Harriman	0.40	15	1.23	27	12.9	22.6
Chase Manhattan	0.39	1	1.10	13	5.6	14.6
Chemical Bank	0.35	13	1.04	12	12.4	14.0
CoreStates Fin. Corp.	0.41	7	1.18	15	10.0	15.7
Credit Suisse First Boston	0.54	23	0.96	4	18.6	8.2
Daimler Chrysler	0.40	4	1.37	37	9.0	26.7
Dun & Bradstreet	0.43	6	0.79	3	9.3	5.7
DuPont	0.58	26	1.40	30	19.3	23.6
Eaton Corporation	0.62	30	1.13	9	24.8	12.2
Fannie Mae	0.48	11	1.36	21	11.8	19.5
Ford Motor Corp	0.62	22	1.33	22	18.2	19.7
General Motors	0.55	25	1.40	23	19.3	21.3
Griggs & Santow	0.75	37	1.31	29	31.1	23.5
IMF	0.58	31	1.27	26	25.5	22.5
JP Morgan	0.51	24	1.45	19	18.7	19.2
Mean	0.49	10	1.23	10	11.6	13.1
Median	0.49	12	1.29	18	11.8	18.8
Merrill Lynch	0.49	18	1.19	16	16.5	17.5
Metropolitan Life	0.68	33	0.84	2	26.0	4.1
Mode	0.50	16	1.33	24	13.5	21.7
Morgan Stanley	0.77	36	1.06	8	29.7	10.8
Mortgage Bankers Assoc.	0.47	19	1.23	31	16.7	23.8
Nat. Assn. of Home Builders	0.53	21	1.50	35	17.3	25.7
Nat. Assn. of Manufacturers	0.30	9	0.67	1	10.9	1.9
NationsBank	0.44	27	1.38	32	19.5	24.0
Northern Trust	0.48	17	1.01	5	13.7	8.3
OECD			1.21	28		23.3
Prudential Insurance	0.38	2	1.37	34	8.2	24.4
Random Walk	1.02	38	3.27	38	32.4	27.8
Regional Financial Assoc	0.68	29	1.50	36	22.7	26.3
Smith Barney	0.44	5	1.22	14	9.1	15.2
Standard & Poor's	0.46	8	1.24	11	10.2	13.9
The Conference Board	0.74	35	1.10	7	29.1	10.3
United States Trust	0.48	20	1.42	33	17.0	24.2
Univ of Michigan – RSQE	0.45	3	1.45	25	8.9	22.3
WEFA Group	0.50	14	1.31	20	12.7	19.5
Wells Fargo Bank	0.63	28	1.30	17	21.3	17.6
Average	**0.54**		**1.28**			
No. Institutions		**38**		**38**		

Note. The table is based on an average over twelve evaluation periods. The last two columns display the relative rank plotted in the diagram. To make the table more readable, columns 3 and 5 display absolute rank obtained by transforming the relative ranks to discrete numbers (see appendix A for details). To complement the information in the table, we also display the average RMSE.

Appendix C. Japan

The top ten CPI forecasters for Japan have very similar RMSE, often differing by only about 0.1 percentage point. The best CPI forecaster is JP Morgan, which also does fairly well for GDP forecasts (see table C1 and figure C1). Although

Figure C1. Average relative rank 1991–2000, Japan, GDP and CPI



Note. The diagram is constructed as follows. Each institution included in a given month is assigned a relative rank based on RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average relative rank over all 12 evaluation periods (see appendix A for details). The best forecasters for GDP and inflation in the sense of best relative rank are in the lower left of the diagram.

Source: Consensus Forecasts.

Nikko Research Center has marginally lower RMSE than JP Morgan, it is also included fewer times (six compared to twelve), which explains its lower rank. The mean, mode and median differ in RMSE by only a few hundred percentage points, but the median does much better in the CPI-ranking than the two other measures. This strong performance of the median is probably a slight exaggeration, but all three measures of central tendency do fairly well. Smith Barney is another top CPI-forecaster for Japan.

The best GDP-forecaster is the Tokai Bank (not displayed in diagram C1). For GDP, the differences in forecasting performance are larger than for CPI. The number two ranked, the mean, has about 0.7 percentage points higher RMSE than the Tokai Bank. Other top GDP forecasters are Merrill Lynch, Mitsubishi Research Institute and Sumitomo Life Research Institute.

Table C1. Average RMSE for Japan 1991–2000

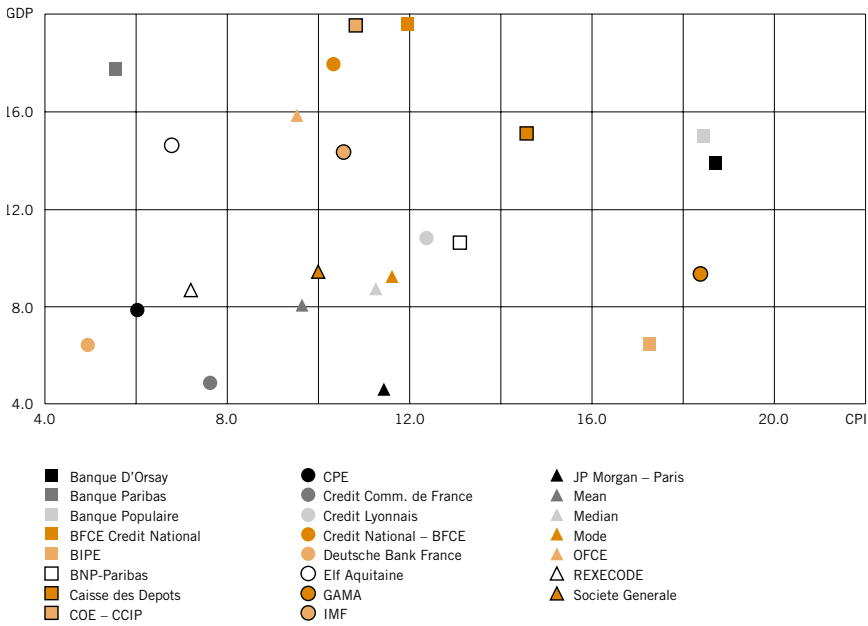
Institution	RMSE CPI	CPI rank	RMSE GDP	GDP rank	Average CPI Rank	Average GDP Rank
Bank of Tokyo Mitsubishi	0.40	10	1.65	20	9.1	14.4
Dai-Ichi Kangyo Research Institute	0.44	7	1.73	11	8.1	9.8
Daiwa Institute of Research	0.58	11	1.86	15	10.3	10.6
Fuji Research Institute	0.53	21	1.64	17	16.2	11.6
IMF	0.53	20	1.85	16	15.5	11.3
Industrial Bank of Japan	0.35	16	1.48	21	12.4	14.6
Japan Ctr for Econ. Research	0.37	13	1.44	8	11.6	7.9
JP Morgan – Japan	0.32	1	1.86	6	3.2	7.3
LTCB	0.41	18	1.50	9	13.6	8.6
Mean	0.47	5	1.79	2	5.8	5.0
Median	0.46	2	1.83	7	5.6	7.4
Merrill Lynch – Japan	0.57	15	1.73	3	12.3	5.8
Mitsubishi Research Institute	0.36	12	1.38	4	11.0	6.1
Mode	0.50	6	1.87	10	7.0	9.2
NCB Research Institute	0.42	17	1.62	19	13.5	14.3
Nikko Research Center	0.29	4	1.40	14	5.7	10.3
Nomura Research Institute	0.34	9	1.78	23	9.0	18.3
OECD			1.70	12		10.0
Random Walk	1.24	22	3.01	24	17.9	18.3
Smith Barney – Tokyo	0.33	3	2.25	22	5.6	16.5
Sumitomo Life Research Institute	0.57	14	1.76	5	12.2	7.0
Tokai Bank			1.07	1		4.8
Toyota Motor Corporation	0.70	19	1.93	13	14.8	10.2
Yamaichi Research Institute	0.35	8	1.56	18	8.5	13.5
Average	**0.48**		**1.74**			
No. Institutions		**22**		**38**		

Note. The table is based on an average over twelve evaluation periods. The last two columns display the relative rank plotted in the diagram. To make the table more readable, columns 3 and 5 display absolute rank obtained by transforming the relative ranks to discrete numbers (see appendix A for details). To complement the information in the table, we also display the average RMSE.

Appendix D. France

The top inflation forecaster is Deutsche Bank France, closely followed by Banque Paribas. The latter has marginally lower RMSE than the former, but in almost all evaluation periods when they are both included, Deutsche Bank France is higher ranked. CPE is another top forecaster, but with a somewhat uneven performance: in the beginning of the year, its current year forecasts are mediocre and deteriorate rapidly in relative ranking (to rank 16 for June forecasts). Then towards the end of the year, its performance picks up remarkably (to rank 1 for October forecasts). For next-year forecasts, by contrast, it does quite well and stays within the top 4.

Figure D1. Average relative rank, 1991–2000, France, GDP and CPI



Note. The diagram is constructed as follows. Each institution included in a given month is assigned a relative rank based on RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average relative rank over all 12 evaluation periods (see appendix A for details). The best forecasters for GDP and inflation in the sense of best relative rank are in the lower left of the diagram.

Source: Consensus Forecasts.

For GDP forecasts, JP Morgan – Paris has the best ranking. Other top forecasters are Credit Comm. de France and Deutsche Bank France. BIPE has the lowest RMSE of all and does quite well in most evaluation periods except for towards the end of the year for current year forecasts. This is in turn explained by a rather large overestimate for 1995 and an underestimate for 1999 (both about 1 percentage point). CPE follows a similar pattern both in profile over the evaluation periods and the years for which its forecasts yielded the largest error.

Overall, Deutsche Bank France and Credit Comm. de France are the top GDP and inflation forecasters. Banque Indosuez is the worst forecaster and is the only institution in our survey that has a lower rank than the random walk.

Table D1. Average RMSE for France 1991–2000

Institution	CPI RMSE	CPI rank	GDP RMSE	GDP rank	Average CPI Rank	Average GDP Rank
Banque D'Orsay	0.63	23	1.10	15	18.7	13.9
Banque Indosuez	0.54	25	0.94	23	22.6	18.0
Banque Paribas	0.38	2	1.01	21	5.5	17.8
Banque Populaire	0.64	22	1.12	17	18.4	15.0
BFCE Credit National	0.53	16	1.27	25	11.9	19.7
BIPE	0.46	20	0.60	4	17.3	6.5
BNP-Paribas	0.55	18	1.13	12	13.1	10.6
Caisse des Depots	0.54	19	1.10	18	14.5	15.1
COE – CCIP	0.46	12	1.12	24	10.8	19.5
CPE	0.37	3	0.70	5	6.0	7.9
Credit Comm. de France	0.50	6	0.91	2	7.6	4.9
Credit Lyonnais	0.54	17	0.98	13	12.3	10.8
Credit National – BFCE	0.46	10	1.11	22	10.3	17.9
Deutsche Bank France	0.43	1	0.80	3	4.9	6.4
Elf Aquitaine	0.48	4	1.14	16	6.8	14.7
GAMA	0.61	21	0.93	11	18.4	9.4
IMF	0.47	11	1.08	19	10.5	15.5
JP Morgan – Paris	0.54	14	0.72	1	11.4	4.6
Mean	0.51	8	1.03	6	9.6	8.0
Median	0.53	13	1.03	8	11.3	8.7
Mode	0.53	15	1.03	9	11.6	9.3
OECD			0.93	14		11.8
OFCE	0.39	7	1.02	20	9.5	15.8
Random Walk	0.84	24	1.65	26	22.3	22.7
REXECODE	0.47	5	0.99	7	7.2	8.6
Societe Generale	0.46	9	0.94	10	10.0	9.3
Average	**0.51**		**1.01**			
No. Institutions		**25**		**26**		

Note. The table is based on an average over twelve evaluation periods. The last two columns display the relative rank plotted in the figure. To make the table more readable, columns 3 and 5 display absolute rank obtained by transforming the relative ranks to discrete numbers (see appendix A for details). To complement the information in the table, we also display the average RMSE.

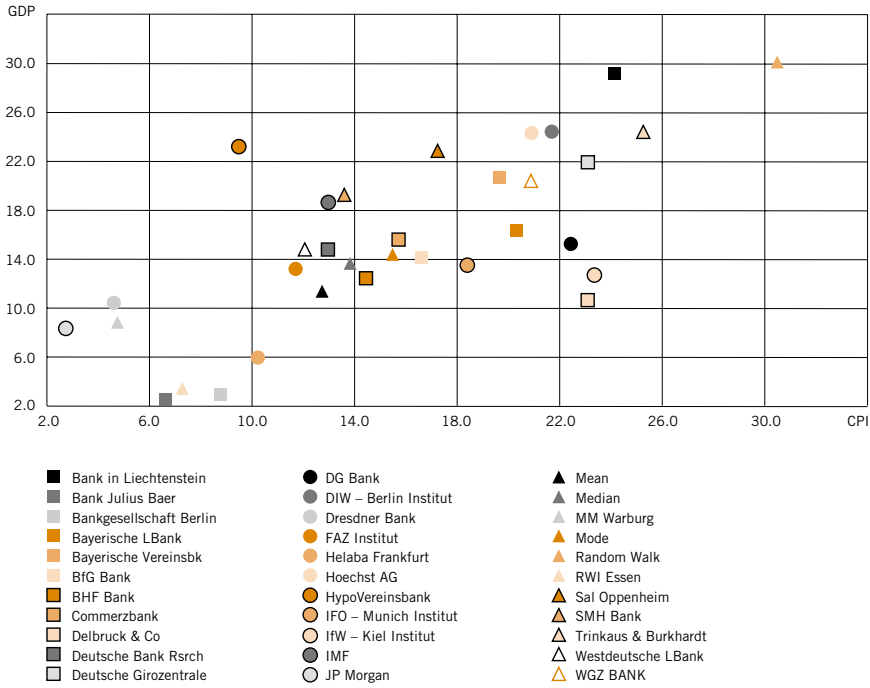
Appendix E. Germany

With regard to inflation, JP Morgan is consistently highly ranked and is also the best overall. Other good forecasters are Dresdner Bank, MM Warburg and Bank Julius Baer.

For GDP, Bank Julius Baer has the highest rank, followed by Bankgesellschaft Berlin, RWI Essen and Helaba Frankfurt. JP Morgan is also among the top forecasters, with a RMSE only about 0.1 percentage point worse than Bank Julius Baer.

Overall, for both GDP and inflation forecasting performance, the picture for Germany looks slightly different than for other countries. There is no institution

Figure E1. Average relative rank, 1991–2000, Germany, GDP and CPI



Note. The diagram is constructed as follows. Each institution included in a given month is assigned a relative rank based on RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average relative rank over all 12 evaluation periods (see appendix A for details). The best forecasters for GDP and inflation in the sense of best relative rank are in the lower left of the diagram.

Source: Consensus Forecasts.

that dominates both; instead there are two groups with either superior inflation forecasters or superior GDP forecasters, as depicted in figure E1 (the same institutions as mentioned above). Other institutions receive much worse relative ranking. JP Morgan and Bank Julius Baer have the best trade-off between superior inflation and superior GDP forecasts.

Table E1. Average RMSE for Germany 1991–2000

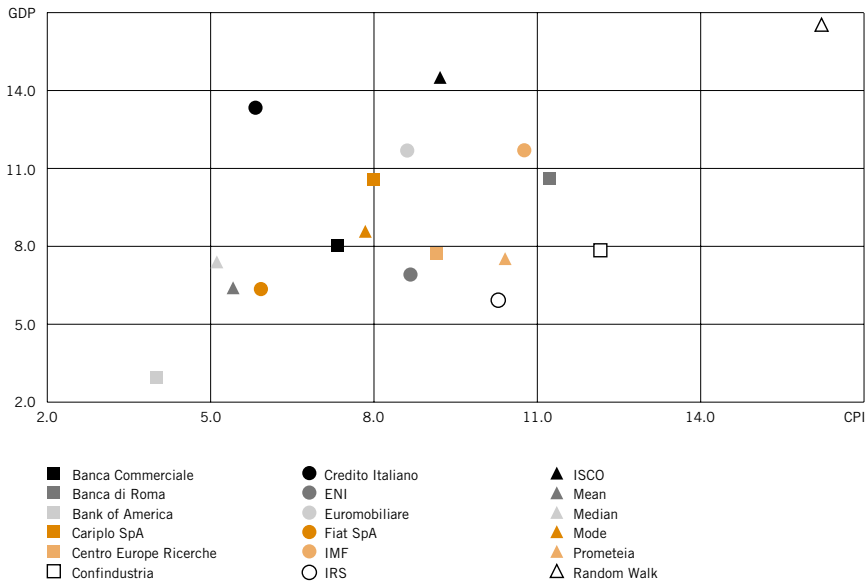
Institution	CPI RMSE	CPI rank	GDP RMSE	GDP rank	Average CPI Rank	Average GDP Rank
Bank in Liechtenstein	0.84	31	1.78	33	24.1	29.2
Bank Julius Baer	0.56	4	0.64	1	6.7	2.2
Bank Gesellschaft Berlin	0.61	6	0.69	2	8.8	3.1
Bayerische LBank	0.74	23	1.24	22	20.3	16.3
Bayerische Vereinsbk	0.70	22	1.24	26	19.6	20.7
BfG Bank	0.72	19	1.20	15	16.5	14.2
BHF Bank	0.70	16	1.12	10	14.4	12.5
Commerzbank	0.68	18	1.18	21	15.7	15.7
Delbruck & Co	0.78	28	1.11	8	23.1	10.8
Deutsche Bank Rsrch	0.69	12	1.21	18	12.8	14.8
Deutsche Girozentrale	0.82	29	1.37	27	23.1	21.9
DG Bank	0.80	27	1.22	20	22.4	15.4
DIW – Berlin Institut	0.68	26	1.31	32	21.7	24.4
Dresdner Bank	0.52	2	1.15	7	4.7	10.5
FAZ Institut	0.63	9	1.18	12	11.7	13.3
Helaba Frankfurt	0.63	8	0.84	4	10.3	6.0
Hoechst AG	0.71	25	1.36	31	20.9	24.4
HypoVereinsbank	0.62	7	1.33	29	9.5	23.4
IFO – Munich Institut	0.65	21	1.16	14	18.4	13.6
IfW – Kiel Institut	0.77	30	1.15	11	23.4	12.8
IMF	0.59	13	1.31	23	13.0	18.8
JP Morgan	0.50	1	0.75	5	2.8	8.4
Mean	0.69	11	1.17	9	12.8	11.4
Median	0.70	15	1.19	13	13.8	13.6
MM Warburg	0.53	3	0.96	6	4.8	8.9
Mode	0.71	17	1.20	16	15.5	14.4
OECD			1.11	19		15.0
Random Walk	1.45	33	2.37	34	30.4	30.1
RWI Essen	0.53	5	0.72	3	7.3	3.5
Sal Oppenheim	0.72	20	1.39	28	17.3	22.8
SMH Bank	0.65	14	1.28	24	13.6	19.3
Trinkaus & Burkhardt	0.78	32	1.34	30	25.3	24.3
Westdeutsche L Bank	0.67	10	1.17	17	12.1	14,8
WGZ Bank	0.78	24	1.30	25	20.8	20.4
Average	**0.70**		**1.20**			
No. Institutions		**33**		**34**		

Note. The table is based on an average over twelve evaluation periods. The last two columns display the relative rank plotted in the figure. To make the table more readable, columns 3 and 5 display absolute rank obtained by transforming the relative ranks to discrete numbers (see appendix A for details). To complement the information in the table, we also display the average RMSE.

Appendix F. Italy

The top five forecasters for Italian CPI have very similar forecasting performance. The highest ranked is Bank of America, but the difference in forecasting performance to the other top forecasters – Credito Italiano, Fiat Spa and the mean – is small. One notable feature is that none of these forecasters are consistent in their ranking. The relative ranking among the top five changes almost

Figure F1. Average relative rank, 1991–2000, Italy, GDP and CPI



Note. The diagram is constructed as follows. Each institution included in a given month is assigned a relative rank based on RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average relative rank over all 12 evaluation periods (see appendix A for details). The best forecasters for GDP and inflation in the sense of best relative rank are in the lower left of the diagram.

Source: Consensus Forecasts.

every month. Another notable feature is that the mean, rather unusually if compared to other countries except Japan, is among the top.

For GDP forecasts, the Bank of America is also best. Other top forecasters are IRS, Fiat SpA and the mean. In terms of stability of ranking, we observe the same mediocre pattern as for CPI-forecasts. The mean is again a top forecaster.

Overall Bank of America is the best GDP and inflation forecaster, as depicted in figure F1.

Table F1. Average RMSE for Italy 1991–2000

Institution	CPI RMSE	CPI rank	GDP RMSE	GDP rank	Average CPI Rank	Average GDP Rank
Banca Commerciale	0.66	6	0.96	10	7.3	8.0
Banca di Roma	0.60	16	0.99	14	11.2	10.6
Bank of America	0.55	1	0.68	1	4.0	3.0
Cariplo SpA	0.66	8	1.06	13	8.0	10.6
Centro Europe Ricerche	0.72	11	0.93	8	9.2	7.7
Confindustria	0.82	17	0.93	9	12.2	7.8
Credito Italiano	0.62	4	1.13	17	5.8	13.3
ENI	0.71	10	0.79	5	8.7	6.9
Euromobiliare	0.73	9	1.15	15	8.6	11.7
Fiat SpA	0.62	5	0.94	3	5.9	6.4
IMF	0.68	15	1.01	16	10.8	11.8
IRS	0.68	13	0.84	2	10.3	6.0
ISCO	0.60	12	0.96	18	9.2	14.4
Mean	0.62	3	0.95	4	5.4	6.4
Median	0.62	2	0.96	6	5.1	7.4
Mode	0.65	7	0.98	11	7.8	8.5
OECD			0.87	12		9.8
Prometeia	0.78	14	0.93	7	10.4	7.5
Random Walk	1.42	18	1.53	19	16.3	16.5
Average	**0.71**		**0.98**			
No. Institutions		**18**		**19**		

Note. The table is based on an average over twelve evaluation periods. The last two columns display the relative rank plotted in the figure. To make the table more readable, columns 3 and 5 display absolute rank obtained by transforming the relative ranks to discrete numbers (see appendix A for details). To complement the information in the table, we also display the average RMSE.

Appendix G. Sweden

For inflation forecasts, Öhmans is most highly ranked, followed by Morgan Stanley and Matteus FK. The latter has the lowest RMSE of all institutions, but is not ranked the highest as those four times when it is included, its relative position is only superior in one month.

For GDP forecasts, Öhmans is again the most highly ranked, followed by the mode, the median and the Industrial Bank of Japan.

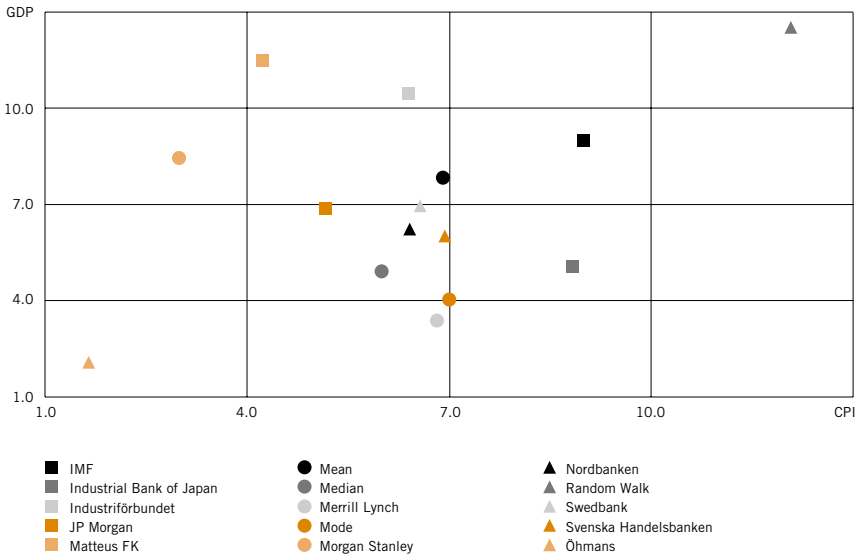
Overall, there seems to be no forecasting advantage for domestic institutions relative to foreign. Although Matteus has a relatively good performance for inflation, its GDP forecasts are relatively poor; for the Industrial Bank of Japan the situation is reversed.

The best forecaster for both GDP and inflation – by a considerable stretch – is Öhmans, as illustrated in figure G1.[11] Both the IMF and the OECD are among the worst forecasters for Sweden.

How good were forecasters in predicting the upturn in Swedish inflation

[11] Öhmans has almost identical RMSE for GDP and inflation, but this is simply a coincidence.

Figure G1. Average relative rank, 1991–2000, Sweden, GDP and CPI



Note. The diagram is constructed as follows. Each institution included in a given month is assigned a relative rank based on RMSE: the best is ranked 1, the next 2 and so on. We then compute both the average relative rank over all 12 evaluation periods (see appendix A for details). The best forecasters for GDP and inflation in the sense of best relative rank are in the lower left of the diagram.

Source: Consensus Forecasts.

Table G1. Average RMSE for Sweden 1991–2000

Institution	CPI RMSE	CPI rank	GDP RMSE	GDP rank	Average CPI Rank	Average GDP Rank
IMF	1.24	14	1.12	12	9.0	9.0
Industrial Bank of Japan	1.17	13	0.88	5	8.8	5.1
Industriförbundet	0.85	6	1.25	13	6.4	10.6
JP Morgan	1.12	4	1.01	9	5.2	6.9
Matteus FK	0.47	3	1.16	15	4.3	11.5
Mean	1.11	11	1.10	10	6.9	7.8
Median	1.08	5	0.87	4	6.0	4.9
Merrill Lynch	0.56	9	0.68	2	6.8	3.4
Mode	1.11	12	0.85	3	7.0	4.1
Morgan Stanley	0.68	2	1.05	11	3.0	8.5
Nordbanken	1.06	7	0.94	7	6.4	6.2
OECD			1.22	14		11.0
Random Walk	3.18	15	3.07	16	12.1	12.4
Swedbank	1.04	8	1.00	8	6.6	6.9
Svenska Handelsbanken	1.09	10	0.94	6	6.9	6.0
Öhmans	0.72	1	0.72	1	1.6	2.1
Average	**1.10**		**1.12**			
No. Institutions		**15**		**16**		

Note. The table is based on an average over twelve evaluation periods. The last two columns display the relative rank plotted in the figure. To make the table more readable, columns 3 and 5 display absolute rank obtained by transforming the relative ranks to discrete numbers (see appendix A for details). To complement the information in the table. we also display the average RMSE.

during 2001? The vast majority of institutions were underpredicting this figure based on data for January-June. The Consensus mean for the current year is about 2.3 in June 2001 which is about half a percentage point higher than the mean a year earlier. One exception is SEB which had forecasts of around 3 per cent during 2000 January to August, although after August they began to strongly revise the forecast downwards to slightly below the current mean. Svenska Handelsbanken is another exception with a forecast of about 2.5 per cent during a large part of 2000, although they revised their forecasts downwards to 2.1 per cent in the end of 2000. Öhmans did not forecast the upturn, predicting in December 2000, Swedish inflation would be around 1.5 per cent in 2001.

References

Batchelor, R., (1997), ”How useful are the forecasts of intergovernmental agencies? The OECD and IMF versus the Consensus”, Working paper, *City University Business School*, London, UK.

Blix, M. & Sellin, P., (1998), ”Uncertainty bands for inflation forecasts”, Sveriges Riksbank Working Paper, No. 65.

Blix, M. & Sellin, P., (1999), ”Inflation forecasts with uncertainty intervals”, *Sveriges Riksbank Quarterly Review*, No. 2, pp. 12–28.

Blix, M. & Sellin, P., (2000), ”A bivariate distribution for inflation and output forecasts”, Sveriges Riksbank Working Paper No. 102.

Britton, E., Fischer, P. & Whitley, J., (1988), ”The inflation report projections: understanding the Fan chart”, Bank of England Quarterly Review.

Diebold, F.X., Tay, A.S. & Wallis, K.F., (1999), ”Evaluating density forecasts of inflation: the survey of professional forecasters”, in *Cointegration, Causality, and Forecasting: A Festschrift in Honour of Clive W.J. Granger*, Engle R.F., White H. (eds), Oxford University Press: Oxford.

Eriksson, J.A. & Ådahl, M., (2000), ”Is there a ’new economy’ and is it coming to Europe?”, *Sveriges Riksbank Economic Review*, No. 1, pp. 22–67.

Gavin, W.T. & Mandal, R.J., (2000), ”Forecasting inflation and growth: do private forecasts match those of policymakers?”, Federal Reserve Bank of St. Louis, Working Paper No. 2000-026A.

Glück, H., Schleicher, S.P. & Catena, R., (2000), ”What do OECD forecasts and data revisions reveal?”, Fall Meeting of Project LINK, October 2–6, Oslo, Norway.

IMF World Economic Outlook (2001), ”Box 1.1 How well do forecasters predict turning points?”, pp. 6–8.

Jansson, P. & Vredin, A., (2000), ”Forecast-based monetary policy in Sweden 1992–1998: A view from within”, Sveriges Riksbank Working Paper No. 120.

Keereman, F., (1999), “The track record of Commission forecasts”, Economic Papers, *European Commission* (Directorate General for Economic and Financial Affairs), Brussels, Belgium.

OECD Economic Outlook (2000), December.

Orphanides, A., (1999), ”The quest for prosperity without inflation”, Sveriges Riksbank Working Paper No. 93.

Shiller, R.J., (2000), *Irrational Excuberance*, Princeton University Press.

Tay, A.S. & Wallis, K.F., (2000), ”Density Forecasting: A Survey”, *Journal of Forecasting*, 19, pp. 235–254.

Thomas, L. B. & Grant, A.P., (2000), ”Forecasting inflation – Surveys versus other forecasts”, *Business Economics*, 35(3), pp. 9–18.

Öller, L.E. & Barot, B., (2000), “The accuracy of European growth and inflation forecasts”, Working Paper No. 72, *National Institute of Economic Research*, Stockholm, Sweden.