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Panel on Economics for the Numerically Challenged

Transcript of Presentation to:

Canadian Association of Journalists

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Do we have a problem?

Same official releases, same date

December 15, 1990:

Inflation rises again

Ottawa Citizen

Inflation eases in November

Globe and Mail

October 30, 1992:

Ottawa faces spending cuts as deficit soars

Toronto Star

Federal deficit declines

But not as much as Ottawa hoped

Globe and Mail

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To Canadian Association of Journalists
Panel: "Economics For The Numerically Challenged"
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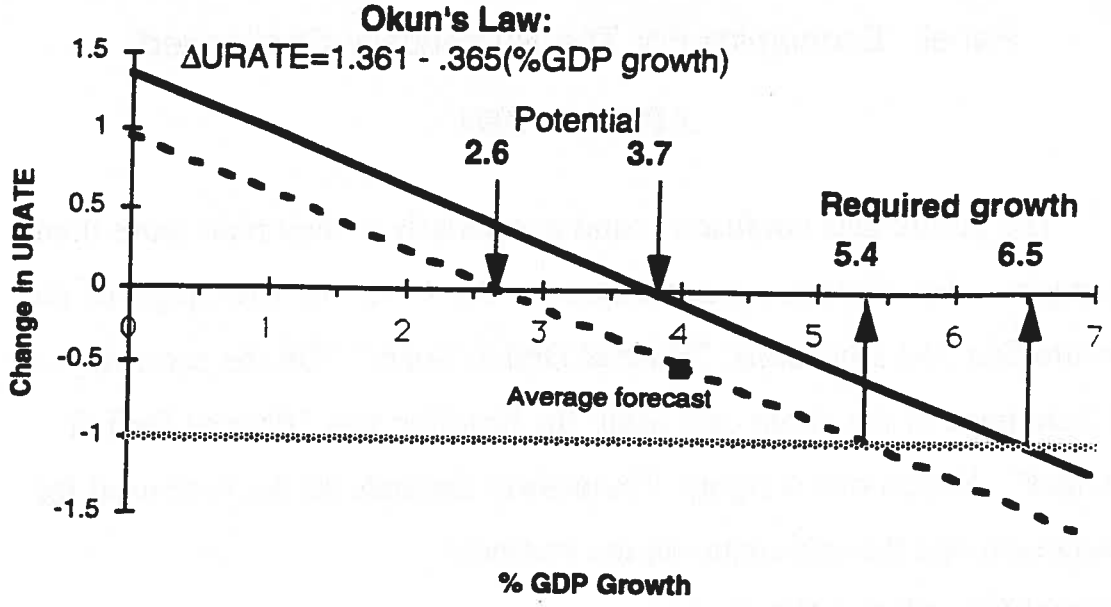
The public gets confused - and particularly if they read more than one paper a day. For example, on October 30, 1992, the front page of the Toronto Star had a headline, "Federal Deficit Soars". On the same day, on the front page of the Globe and Mail the headline was "Federal Deficit Declines". Which one is right? The answer depends on the base used for comparison and the arithmetic on the numbers.

Potential Growth and Okun's Law

The problems with numbers in economics and forecasts is that you are not the only one who is uncomfortable. The politicians make statements such as Paul Martin's recent comment that employment growth and real economic growth have become disconnected. I don't know what his 300 economists in the Department are telling him, but I am suspicious of this view.

There is a simple relationship - so-called Okun's Law - named after a US economist in the early '60s who posited a relationship between changes in the unemployment rate and GDP growth. One can estimate this for Canada and essentially, if GDP growth goes up by one percentage point you will get something like a 0.365 percentage point decline in the unemployment rate. If there is no growth in the economy, it says that the unemployment rate will rise by about 1.4 percentage points a year. So the solid line you see in the chart is the relationship between changes in the unemployment rate and real economic growth. Where it crosses the

Chart 1
2.7% growth is needed for a 1% point drop in the Unemployment Rate



To achieve an unemployment rate (Urate) of 8 per cent by the end of 1996 (a reduction from the 1993 rate of 11.3 per cent to 8.3 per cent for the year 1996) would require about 8.1 percentage points (3 * 2.7) of **additional** growth over the period from 1994 through 1996.

Each year, the labour force grows in Canada by about 200,000 people. To employ these people, thereby keeping the unemployment rate unchanged, requires sufficient growth to create 200,000 jobs. Since 200,000 additional labour force entrants with no change in employment would increase the unemployment rate by about 1.4 percentage points (200,000/14 million), growth of about 3.7 per cent would be required to maintain unemployment rate unchanged. This growth rate is often referred to as the **potential growth rate of the economy**.

Given the government's objective to reach 8 per cent unemployment by the end of 1996, the required economic growth would be about 2.7 per cent per year, on top of the potential growth rate each year of 3.7 per cent, or about 6.5 per cent per year.

Table 1

	URATE	ΔURATE	Growth needed	Consensus Forecast	Required Additional Growth
1993	11.3				
1994	10.3	-1.0	5.4 - 6.5	3.6	1.8 - 2.9
1995	9.3	-1.0	5.4 - 6.5	4.2	1.2 - 2.3
1996	8.3	-1.0	5.4 - 6.5	4.1	1.3 - 2.4
				Average:	1.4 - 2.5

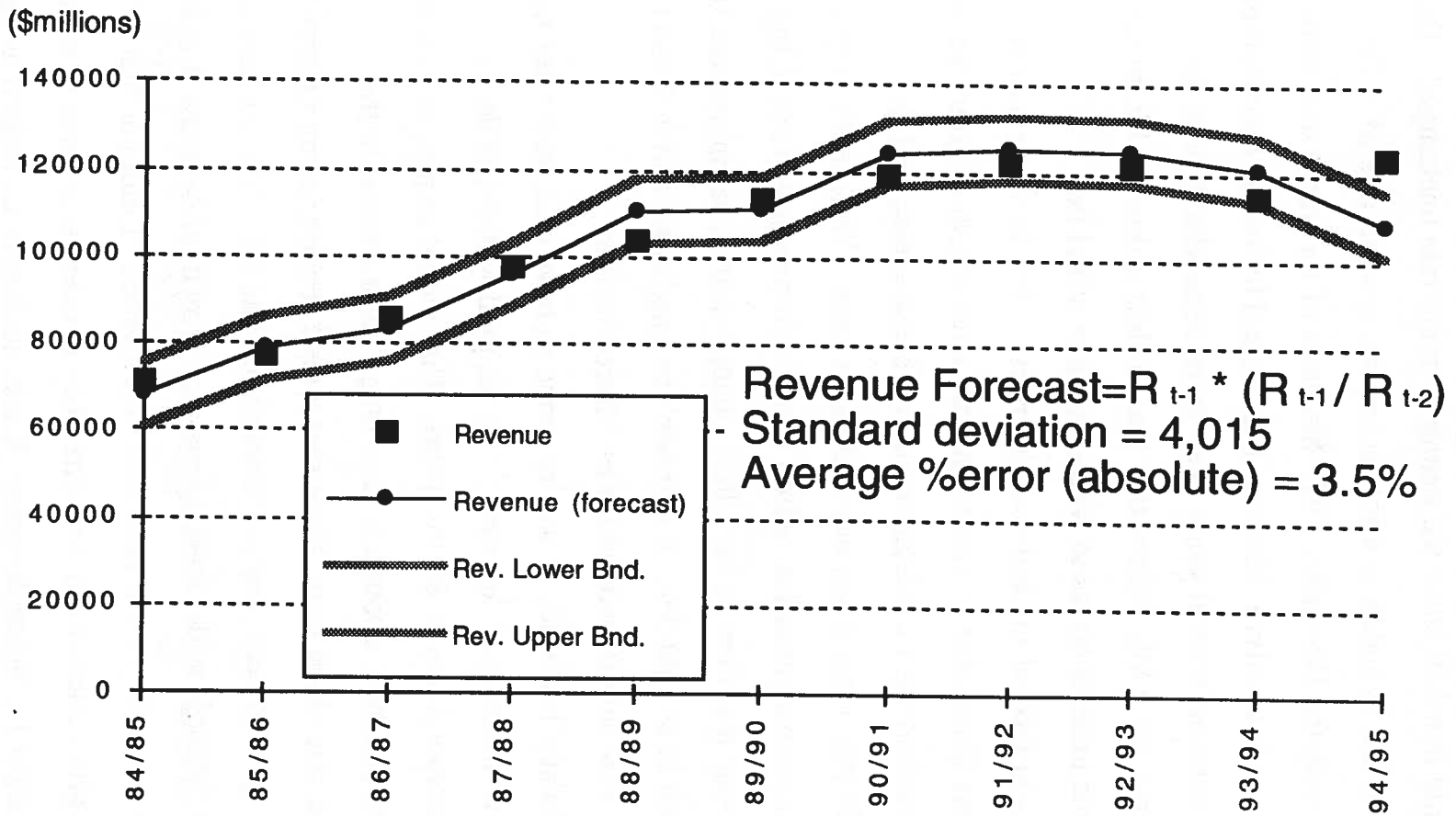
horizontal line is one interpretation of potential growth - the growth rate of the economy that will leave the unemployment rate unchanged. The unemployment rate is stable at a real economic growth rate of 3.7%.

If you took the December 1993 forecasts of the gurus that were gathered in Ottawa to advise Minister Martin and looked at their consensus forecasts for the next several years, they were somewhat below this relationship, but not a lot. I drew this line to shift it down a bit, to say there was some uncertainty as to where this line might be.

But if you look at the last four quarters - 1993 in other words - December over December or fourth quarter over fourth quarter, we had about 3% growth in the Canadian economy in real terms, and the unemployment rate went down one-tenth of a point. Well that's very close to the line, so the disconnection notion is not a disconnection at all, but basically an issue that there is very little change in the unemployment rate because growth is around 3%. It shouldn't be surprising and it doesn't represent any new rule in economics or "disconnection".

The Minister had said, or was reported to have said, just prior to the December 1993 meeting of "experts", that his goal was to get the unemployment rate down to 8% by 1996. That would imply, from where we were at that juncture, about a 1 percentage point decline in the unemployment rate each year. Now that would require, using Okun's law, real economic growth each year of between 5.5 and 6%. The consensus forecast of the wizards at the meeting was for growth of between 3 and 4% so another 1.2 to 2.5% growth each year was needed. I thought that this note was a helpful contribution, but what they decided to do was to stop expressing a target for unemployment. It was no longer an objective, or it

Revenue


($millions)
140000
120000
100000
80000
60000
40000
20000
0
84/85
85/86
86/87
87/88
88/89
89/90
90/91
91/92
92/93
93/94
94/95
Revenue
Revenue (forecast)
Rev. Lower Bnd.
Rev. Upper Bnd.
Revenue Forecast=R t-1 * (R t-1 / R t-2)
Standard deviation = 4,015
Average %error (absolute) = 3.5%

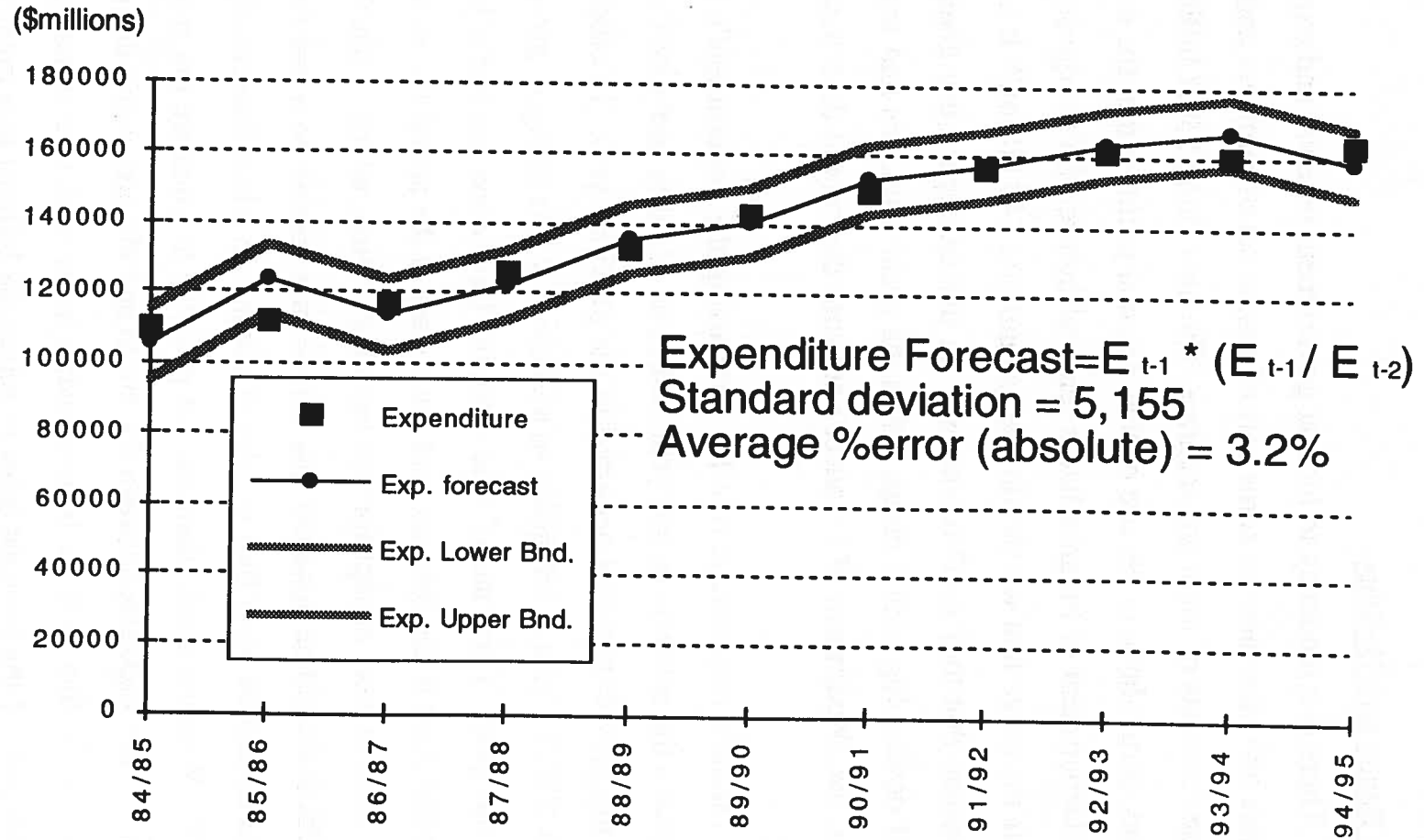
certainly wasn't as strong an objective as a deficit target of 3% of GDP by 1996/97.

Error Bands and Deficits

There is a tendency to look at government revenue and expenditure numbers and take them as some sort of gospel set of numbers and to assume forecasts of them are accurate. The only thing $39.7 billion should tell you, particularly in the use of that decimal point, is that the economists at the Department of Finance had a sense of humor. So the question is what is the range that we should use around that $40 billion? It is unfortunate that they don't report one. In this example I use a very simple way of developing such a range. With the great resources and wisdom they have at the Department of Finance, I am sure they could do a much better job.

I used a very simple rule for forecasting the government's revenue each year - the revenue in this year would be equal to last year's revenue times the growth rate that occurred in the previous year. In other words if it grew 5% last year, I am going to assume that it is going to grow 5% again this year. This "naive" rule wouldn't have done too bad a job. The dot on the chart is the forecast and the square is the actual for each of those years. And indeed, except for this last observation, which is the fiscal year 1994/95, it should be apparent this simple rule doesn't do a bad forecasting job and indeed we may find out that it doesn't do a bad forecasting job for 1994/95. With these calculations, it is possible to calculate the standard deviation - the variation between the circle and the boxes and define an error band. In this case we have drawn a range with two standard errors on either side of the forecast (plus or minus $8 billion) as a range in which you would be comfortable saying that 90% of the time you would expect

Expenditure



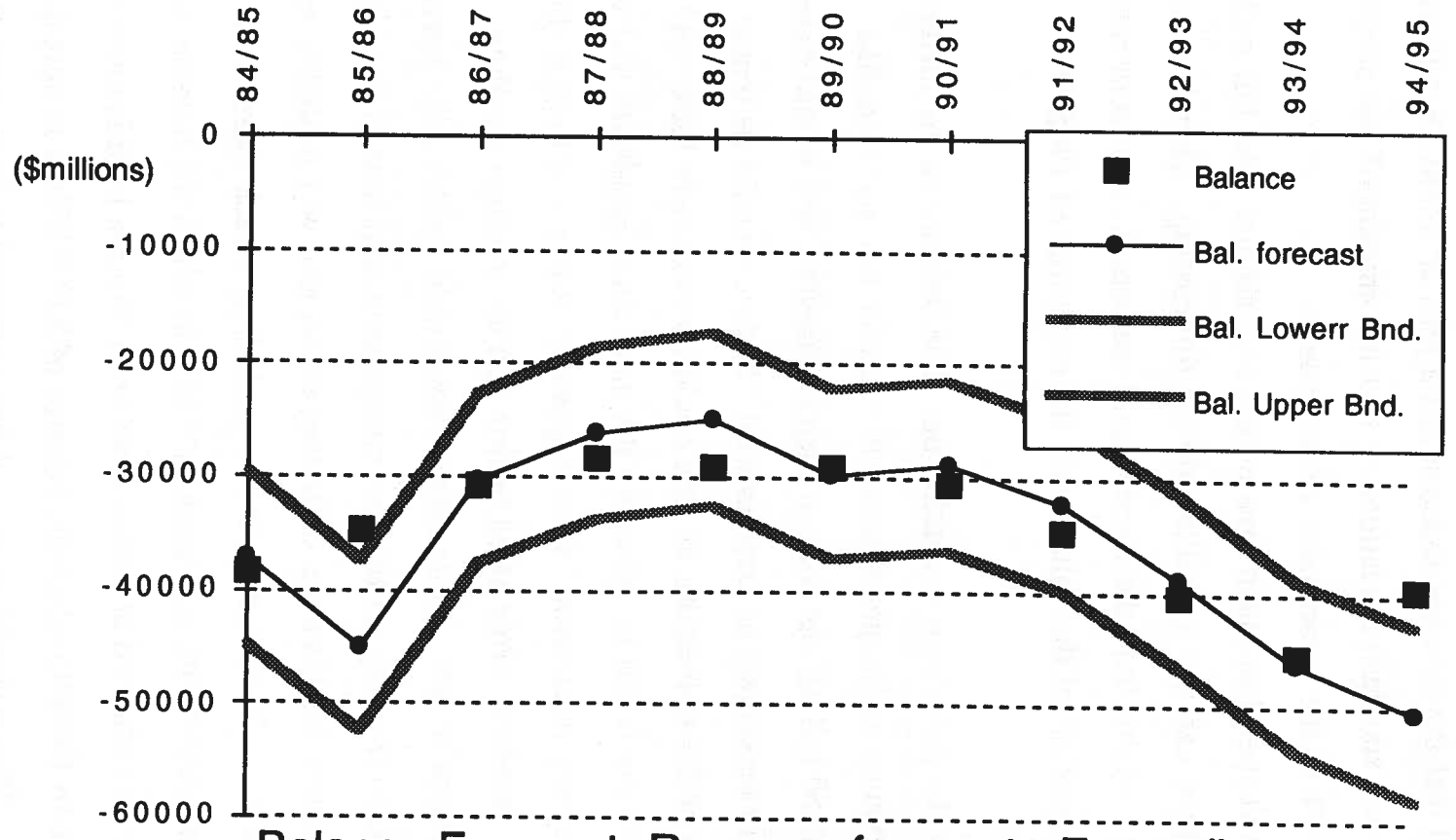
to find the actual value in that range. And you could also express the error as a percentage of the revenue.

This is a very unsophisticated model, but the model allows us to understand that the revenue forecast has a plus or minus $8 billion range on it with two standard deviations or that the amount of one standard error is about 3.5% of the mean value of revenue.

I won't spend as much time on the expenditure side, but will simply note that it too can use a similar rule for forecasting. There's a band, or range, that contains both the forecast and the actual, at plus or minus $10 billion. Almost all of the values with the exception of 1985/86 lie within the band.

Now the punchline is coming up. The **balance** is the difference between revenue and expenditures. If you take two numbers like $120 billion or $160 billion and look at their difference, you would expect that difference to be subject to error as well. In fact it could be worse, it could be the sum of the two errors, or you could be extremely lucky and the error on revenue could be offset by the error on expenditure and you would have very little error. What happens? When you look at this you look at one standard error of $4 billion and an average absolute percentage error of 8%. Notice that it has almost doubled the percentage error we were reporting on the two components and indeed that's partly because we have, in this case, offsetting errors that will probably minimize the discrepancy. There were just two periods in which there were extraordinary deviations, one back in '85/86 in which the balance was much less than indicated or would have been forecast by this amount and one out here in 1994/95 when the balance of $39.7 billion is outside the error bands. That is useful to see - it has happened before in the first term

Balance



Balance Forecast=Revenue forecast - Expenditure forecast
Standard deviation = 3,787
Average %error (absolute) =7.7%

of the Conservative Government. We are in the first term of this Government.

These forecasts reflect no substantive policy changes or changes in the economic environment. It is one of the simplest mechanical rules that can be used. This would suggest that in 1985/86 and in 1993/94 there were some policy changes or other changes in the economy. The number, therefore, that we should be reporting is not $39.7 billion, but something like $40 billion plus or minus $8 billion, or something like a number with roughly a 15% error range on either side. I don't care if you report it as a 15 or 14% error band, that's not the issue. What you might ask Finance is, "You have a sophisticated model, what is your error band on the deficit forecast?" I can tell you it isn't $39.7 billion plus or minus $0.1 billion. I suspect what you would find is that the deviations were less than plus or minus $8 billion, suggested by the "naive" method. So what? The so what is that you will find that the "Bay Street Bawlers", as I sometimes refer to them, keep telling you that there is a big difference between $39.7 and $40.0 billion to the psychology of the market. I suggest they are not being very helpful nor do such statements really reflect the underlying reality of forecasting the difference between two large numbers.

This same caution applies to other "differences" in society that we frequently examine. We look at differences because they are sensitive - the difference between revenue and expenditure, or the deficit or balance; the difference between labour force and employment or unemployment. We focus on unemployment because it is a discriminating and sensitive measure. But it is also the difference between two large numbers subject to a lot of variance, lots of error, and lots of volatility.

How do we Improve?

- **STATISTICAL AGENCIES: Write the story! Nag those who misinterpret.**
- **PROFESSIONAL ECONOMISTS AND ANALYSTS: Help the media, point out errors.**
- **ACADEMICS: Teach your students, make them statistically literate.**
- **MEDIA: Train your reporters.**
- **PUBLIC: React to Nonsense!**

Improving Economic Reporting

In closing, how do we improve the situation in terms of the reporting of economic information?

1. Certainly the statistical agencies can help by writing more of the story for you, with more explanation, and more background

2. When misinterpretations appear in the press, I, on occasion, have called the journalist. I have never had one object to the call. They all seem interested in it, they are all professionals and plan to be in the service for the next 30 years and are not anxious to continue making mistakes.

3. Professional economists can help by answering the phone. Don McGillivray insisted when I complained about economic reporting some 20 years ago that I was part of the problem. He explained that it wasn't going to get better until we encouraged more economists to speak up. I couldn't agree more with him and that is partly why we are open to you.

The Canadian Association for Business Economics puts out a media and speakers book which has about 100 economists names, addresses, phone numbers, and also their areas of specialty, cross-indexed. It is available at no cost to any journalist that wants it, just phone 238-4831.

4. Certainly the academics can teach their students to be a bit more statistically and economically literate.

5. The media can continue to work at its professional development.. This session is part of that professional development.

6. The public's role is to react - it is always better to have readers call or write you, rather than not having anyone calling at all.

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