Some new indicators and procedure to get additional information from the Business Tendency Surveys

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Abstract
This paper sets out some procedure allowing to deriving new information from the Business Tendency Surveys. Precisely, the volatility of respondents' opinions will be computed that can be interpreted as a measure of radical (or true) uncertainty. This measure is strongly recommended by the present economic crisis originated by financial markets that the dominating idea of the impossibility of measuring and hence monitoring radical uncertainty has contributed to consign to an unconstrained and destabilizing speculation. Moreover, some indicators of the persistence of each modality of answer are proposed, as well as a correction of the usual percent of the modalities of survey answers that attributes a higher weight to the answers that do not change in successive survey periods. This correction is mainly suggested by the fact that the degree of persistence of respondents' opinions is an important sign of entrepreneurs and firms' behaviour and decision-making. The modified percents of the modalities of answers are confronted to the usual ones, and some econometric estimations are provided. The applications use data of the Italian and South African business tendency surveys on a number of variables. The resulting information and elaborations seem to suggest some critical consideration on the content of the harmonized EU surveys, mainly with reference to the reliability of the confidence indicators and the disregard of the volatility of answers with its attitude to provide a meaningful indicator of radical uncertainty.

Key Words: Business Tendency Surveys, Expectations, Uncertainty, Business confidence indicators, Econometric estimations

JEL Classification: C10, C19, C81

Introduction

The Business Tendency Surveys have attained a high refinement and engage the efforts of many students and research institutions. An important achievement has been their harmonization at the European Union level that allows to get homogeneous data across 27 States. Notwithstanding the advancement, it may be useful some

[1] Econometric estimations uses some C. R. Wymer's programs that form part of the WYSEA (System Estimation and Analysis) package.
The elaborations by firms of the answers to the UE-ISAE surveys are due to R. Rucci

further deepening aimed at discovering the possibility to derive, from the survey results, more information than at the present. A main purpose of this paper is to investigate such possibility. At first, we shall consider, from a theoretical and logical perspective, the possibility of defining some new indicators allowing to better clarify the meaning of survey answers and extend their utilization. The ways to derive the proposed indicators from the micro discrete data represented by the single firms' answers, will be set out.

This research on indicators has been largely stimulated by the question of radical uncertainty, an important phenomenon both for theoretical and empirical analysis. Mainstream economics substantially ignores radical uncertainty, that is uncertainty that cannot be represented through well defined distributions of probability, while performs sophisticated elaborations on the basis of probability distributions. On the other side, the schools of thought emphasizing uncertainty intend this one in a subjective perspective, often in the sense of subjective probability distributions, and it is frequent the confusion of uncertainty with expectations, forgetting that the first is, on the contrary, expressed by the volatility of expectations. Besides, there exists a dominant convincement that radical uncertainty cannot be measured. It is our strong conviction, corroborated by various applications, that the assumption of non measurability of radical uncertainty is mistaken and that it greatly obstructs the advancement of economic theory and, even more, empirical economical analysis and political economy. The importance of this attempt to derive, from the business tendency surveys, the specification of a measure of radical uncertainty is greatly emphasized by the present economic crisis primed by the volatility of financial markets. In this regard, it may be important to underline that the harmonized EU surveys also include financial services; the application of the method and the indicator of uncertainty we propose to the data provided by the European States that perform the survey on financial services could help to provide some indispensable information and monitoring on financial markets. But this paper mainly insists on some other indicators and the revision they suggest of the computations on survey results.[2]

An empirical application to the monthly ISAE surveys for Italy harmonized at the European level will be performed. More precisely, we shall concentrate on the answers (of a sample of 4000 manufacturing firms) to the following three questions: a) Do you consider current overall order to be above normal, normal for the season, below normal? b) Do you consider your current stock of finished products to be above normal, normal for the season, below normal? c) How do you expect your production to develop over the next 3 months? It will increase, remain unchanged, decrease? The attention for those questions has been suggested by the importance that the European Commission attributes to them, that in fact are used to provide the Industry Confidence Indicator for each State member of the European Community and the whole European Union. An extension of this research to other sectors (services, construction) should be carried out.

[2] On the question of uncertainty and its analysis in the context of BTS, see A. Fusari (2006 a and b)

It will also be exposed a similar application on data for South Africa provided by the Bureau for Economic Research (BER) at Stellenbosch University. The BER evaluates the business conditions in the South African manufacturing sector through quarterly surveys based on ex-post and ex-ante survey questions. For purpose of this paper, the following four expectation questions were considered: a) Compared with the same period a year ago, are expected production volumes up/same/down? b) Compared with the same period a year ago, are expected volumes of orders up/same/down? c) Compared with the same period a year ago, are expected general business conditions better/same/worse? d) Compared to the same period a year ago, are expected fixed investment up/same/down?

The present application brings into focus the changes of each respondent's answers in contiguous monthly (or quarterly) surveys and must be intended as a first step and a way for empirically clarifying the use and relevance of the suggested indicators.

1. The theoretical approach and a proposal of some meaningful indicators.

Our development will try to go beyond the current computations of the percent of the modalities of answers in each period. In fact, we propose to consider also the variation (or permanence) of *each firm's* answer in consecutive survey periods. This knowledge seems to be important for better qualifying the meaning of answers and get information on firms' behaviour.

For the sake of rigour and clearness, it is convenient to start from a transition matrix of survey answers between two time periods. Three modalities of answers will be considered (but consumer surveys include more than three answers): UP, SAME and DOWN, or Better, Same and Worse. The rows and columns of the matrix below respectively refer to time t_0 and t_1, while each row (and column) represents a modality of answer, Up, Same or Down, indicated respectively by the suffixes 1, 2 and 3. The elements R_{ij} of the matrix give the percent of the changes (or permanence) of answers between the two considered periods.

Transition matrix

R_{11} (Up to Up)	R_{12} (Up to Same)	R_{13} (Up to Down)
R_{21} (Same to Up)	R_{22} (Same to Same)	R_{23} (Same to Down)
R_{31} (Down to Up)	R_{32} (Down to Same)	R_{33} (Down to Down)

The crossing of two different modalities (i.e. R_{ij} with $i \neq j$) gives the percent of firms (or consumers) on the total respondents that change answer from i to j in the period t_0 - t_1, while the terms on the main diagonal (R_{ii}) indicate, for each modality, the percent of respondents that do not change answer from one period to another. Note that the current computations of the percent answers miss the terms of the above matrix; they only consider the total by row and column, representing the percent of Up, Same and Down

Clearly, *the answers resulting from very fragile opinions (that is much subjected to change) are less meaningful than those resulting from less volatile opinions. It is not a question of mere reliability. The persistence of respondents' opinion may be right or wrong; the point is that, if a respondent is, for instance, wrongly convinced of something, he operates accordingly; insistence represents, therefore, a relevant information for understanding his behaviour.* This underlines the importance of flanking, to the percentages of answers, an indicator of their degree of permanence and hence weight them with such indicator. Besides, it emerges the relevance of an indicator expressing the volatility of answers. The two indicators are not the reciprocal since, as we shall see soon, one is referred to a single modality of answer while the other is the sum of all changes in answers.

The degree of permanence of answers can be determined as follows:

$$1.\quad PerUp = R_{11}^{(t0:t1)}/Up^{(t1)}$$

giving the proportion of the answers saying Up that do not change from period t_0 to t_1 on the percent of Up relative to period t_1. Of course, the analogous indicator for Same and Down must substitute in the expression, respectively, R_{22} or R_{33} to R_{11}, and Same or Down to Up. As we shall see soon, the indicator 1. can be used to weight the current percent of Up, Same and Down, thus obtaining some new percentages of each modality of answer that take into account the degree of insistence on answers, *such insistence expressing a more marked direction of firms' expectations and opinions*.

A stronger way to compute the permanence indicator is the following:

$$2.\quad PerUp = (R_{11}^{(t0:t1)} + 2\,R''_{11}^{(t1:t2)})/3Up^{(t1)}$$

where R''_{11} represents the part of R_{11} that does not change also in period t_1- t_2 or, in other words, the percent of respondents that give the same answer in three consecutive surveys. The expression of the permanence indicator for Same and Down is identical, with the due changes in R and the denominator.

Also an average on two consecutive periods may be considered, that is:

$$3.\quad PerUp = (R_{11}^{(t0:t1)} + R_{11}^{(t1:t2)})/2Up^{(t1)}$$

Where to the R of the two periods may be attributed a different weight.

For its part, the opinions volatility indicator can be defined as:

$$4.\ OV1 = \Sigma_{t0}^{t1} R_{ij} \qquad \text{with } i \neq j$$

A more appropriate volatility indicator can be expressed giving a double weight to the double jumping in the changes of answer, i.e. to R_{13} and R_{31}:

$$5.\ OV2 = R_{12}+2R_{13}+R_{21}+R_{23}+2R_{31}+R_{32}$$

It is not clear at the present the usefulness of incorporating the indicator of volatility in the average giving the confidence indicator; the clarification would require some additional research, which is in progress. Notwithstanding, a composite confidence indicator incorporating aggregate volatility has been provided. However, the volatility indicator can be profitably used per sé, as a proxy of radical uncertainty that represents a very important variable for economics and political economy analyses.

Now consider some application of the above indicators.

2. Empirical results

The results that will follow concern, as previously noted, three questions of the harmonised EU surveys, two of which express opinions and one expectations, and four questions of the BER surveys on expectations. The reference to opinions stresses the need to measure their volatility. But also the volatility of the answers concerning results, not considered in this paper, may be important under other respects.

The figures will compare ISAE or BER data on the percents of Up, Same, Down to the percents modified according to expression 1. Also the modified balances have been calculated (Modified Up minus Modified Down). The comparison is extended to the confidence indicator as expressed by the arithmetical average of the balances concerning the considered questions. With reference to the volatility indicator, a comparison with ISAE and BER elaborations is not possible since these do not include such indicator.

It seems evident that opinions and their volatility are better expressed by un-weighted survey data, as these give an identical importance to each answer and opinion. At this purpose, it is a duty to advise that our confrontation does not refer to the official ISAE data. In fact, ISAE does not provide un-weighted survey data that, as we said just now, are particularly useful for calculating the volatility of opinions. It uses for surveys a three level stratified sample: each reporting unit is classified according to the size of industry in terms of employment, specialization, region. So survey percentages are aggregated answers in four stages. At any rate, the un-weighted answers used in this application differ a little from the percent of answers forwarded by ISAE. The fact that, in the calculation of the indicators that we propose, the un-weighted data are both in the numerator and denominator of ratios, further reduces the discrepancy. However, this shortcoming does not raise for BER surveys since these consider both weighted and un-weighted answers.

The figures that follow flank, to the ISAE and BER survey percentages, those 'modified' or corrected according to the weight attributed to R_{ii}, i.e. the repeated answers. Here we give to these answers a *double weight* with respect to Up-R_{11}, i. e. the remaining ones. Therefore, the expression for the corrected (or modified) UP is:

$$\text{Modified Up} = (2R_{11} + \text{Up-}R_{11})/3, \text{ that is: } (\text{Up}+R_{11})/3$$

Of course, the correction of Same and Down must substitute, in the above expression, Same or Down to Up and R_{22} or R_{33} to R_{11} [3].

For making comparable the current percent of answers to their modified percents, the sum of the percent of the modified Up, Same and Down has been reported to 100 likewise the sum of the current percent modalities of answers (simply by dividing the percent of each modified answer by the sum of the percent of all modified answers and multiplying by 100)[4].

[3] If the weight of the permanence indicator is supposed, for instance, to be 3, the expression above becomes: $(\text{Up}+2R_{11})/4$.

If we use the expression 2 of the permanence indicator, giving to this a weight of two, we get the following expression for correction: $(R_{11}+4R'_{11}+\text{Up})/7$. For the correction of Same and Down we have to substitute in the expression, respectively, Same or Down to Up and R_{22} or R_{33} to R_{11}.

To give an immediate evidence of what we intend to clarify, the figures below report:

a) The permanence indicator (expression 1 in section 1), a ratio the variability over time of which expresses the difference in the time path of the percentage of the repeated answers (not considered by the current computations on surveys) with respect to the total percent of the corresponding answers; it gives, therefore, an idea of the relevance of the correction we propose.

b) The ratio between the modified percent of answers and the usual percent of answers. The difference with respect to one of this ratio expresses the *percentage of correction*, i.e. the percent difference between the modified and current percentages.

c) The ratio (R11-R33)/balance, that gives the variation, over time, of the difference of the percent of persisting Up and Down (used for our corrections) with respect to Up minus Down, i.e. the usual balances. This ratio gives an idea of the impact on balances of our correction. Such correction is plainly expressed by the ratio between the modified balance and the usual one: (ModifiedUp–ModifiedDown)/(Up – Down).

In the figures, the variable sub a) is indicated by the permanence indicators R11/Up; R22/Same; R33/Down. The variable sub b) is indicated by the ratios ModifiedUp/ISAEUp, ModifiedSame/ISAESame; ModifiedDown/ISAEDown. The variables sub c are indicated by (R11-R33)/balance and ModifiedBalance/ISAEbalance. Of course, for South Africa, the name ISAE will be substituted by BER.

A constant of 100 has been added to R11-R33 and Balances in order to avoid negative numbers that would make meaningless the ratios under c and ModifiedBalance/Balance

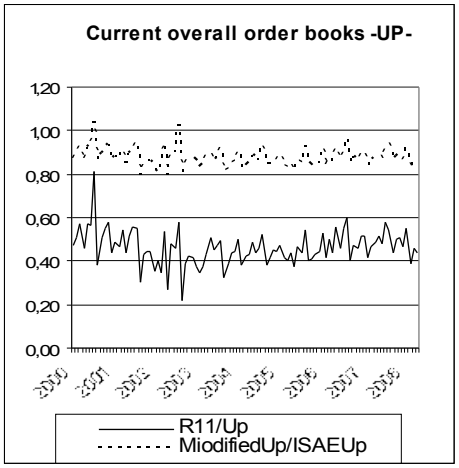
The last figure flanks the usual confidence indicator to a composite confidence indicator, i.e. incorporating aggregate volatility with the same weight of the other component.

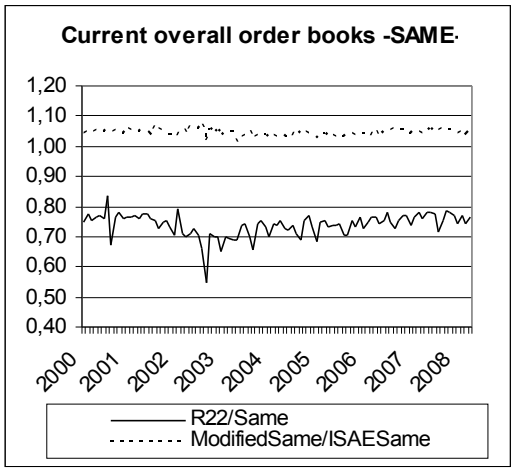
Italy

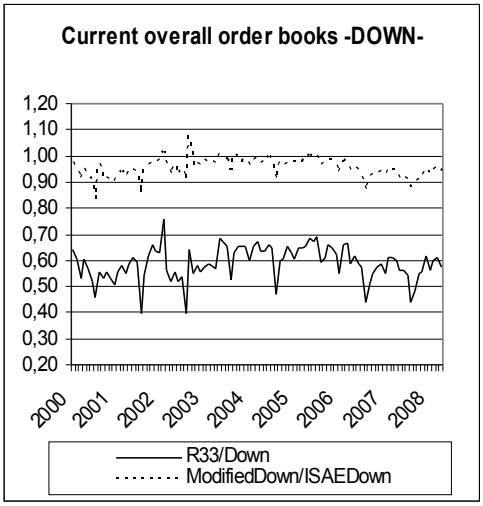
The data concern 8 years or, more precisely, 99 monthly periods of survey starting from February 2000.

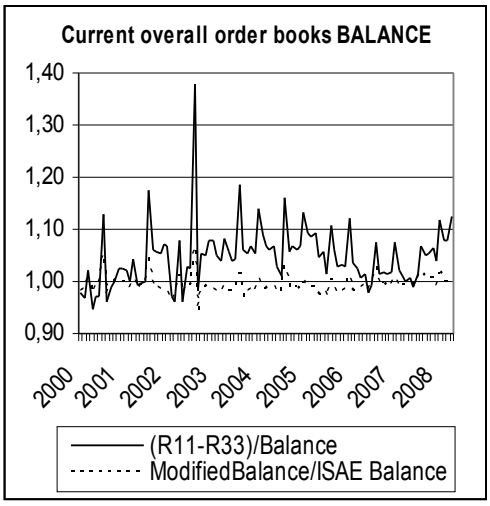
Figures

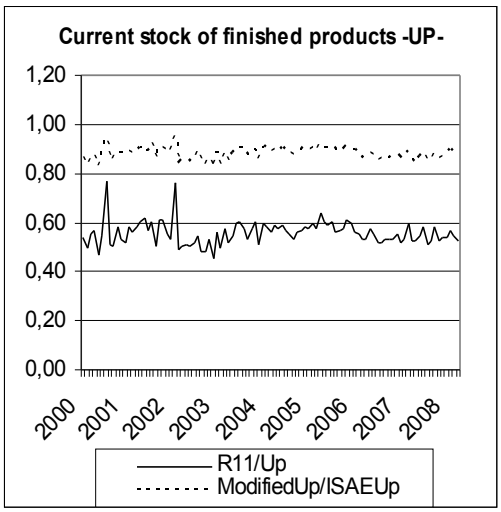
[4] In fact, ModifiedUp/Σmodified(Up+Same+Down) + ModifiedSame/Σmodified(Up+Same+Down) + Modified Down/Σmodified(Up+Same+Down)*100 = 100

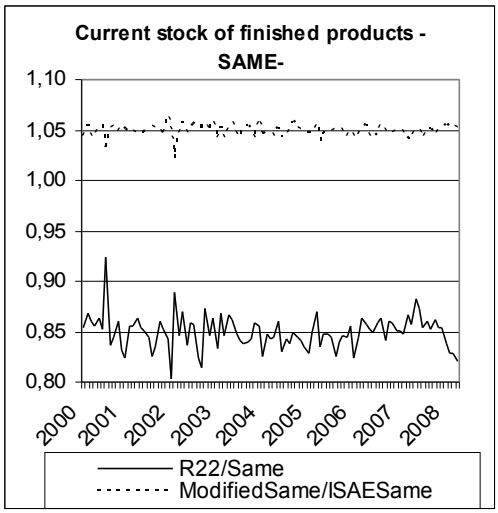

Current overall order books -UP-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
R11/Up
MiodifiedUp/ISAEUp

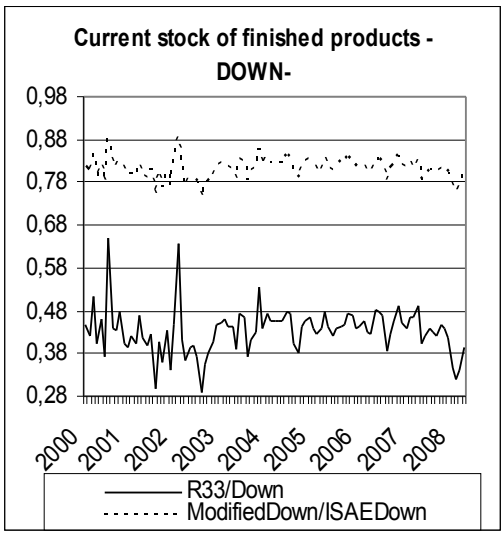

Current overall order books -SAME-
1,20
1,10
1,00
0,90
0,80
0,70
0,60
0,50
0,40
2000
2001
2002
2003
2004
2005
2006
2007
2008
R22/Same
ModifiedSame/ISAESame

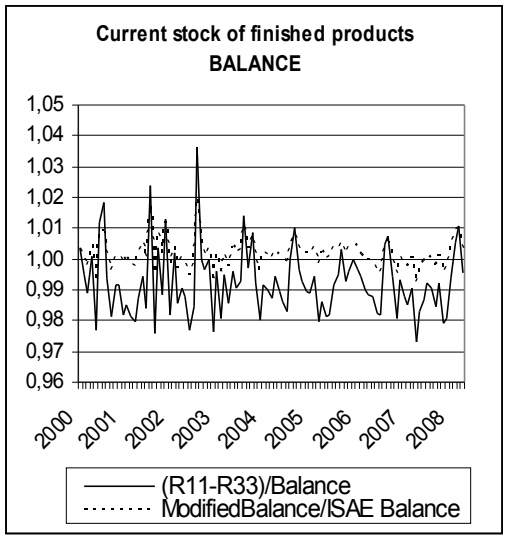

Current overall order books -DOWN-
1,20
1,10
1,00
0,90
0,80
0,70
0,60
0,50
0,40
0,30
0,20
2000
2001
2002
2003
2004
2005
2006
2007
2008
R33/Down
ModifiedDown/ISAEDown

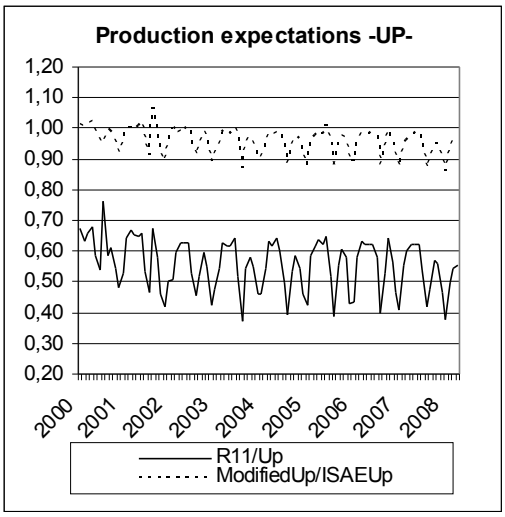

Current overall order books BALANCE
1,40
1,30
1,20
1,10
1,00
0,90
2000
2001
2002
2003
2004
2005
2006
2007
2008
(R11-R33)/Balance
ModifiedBalance/ISAE Balance

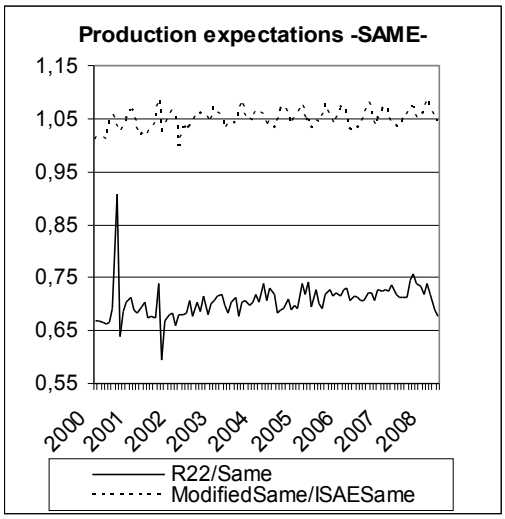

Current stock of finished products -UP-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
2000
2001
2002
2003
2004
2005
2006
2007
2008
R11/Up
ModifiedUp/ISAEUp

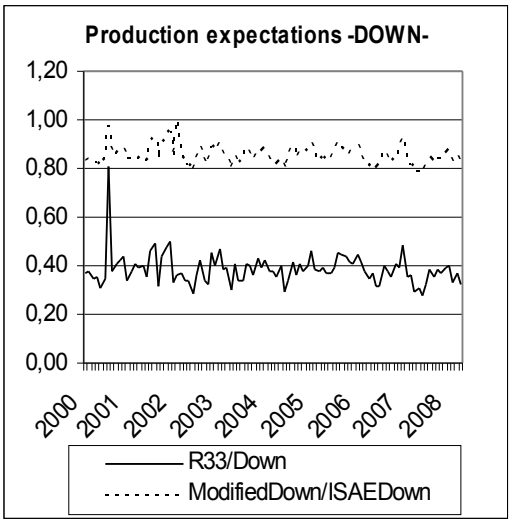

Current stock of finished products -SAME-
1,10
1,05
1,00
0,95
0,90
0,85
0,80
2000
2001
2002
2003
2004
2005
2006
2007
2008
R22/Same
ModifiedSame/ISAESame

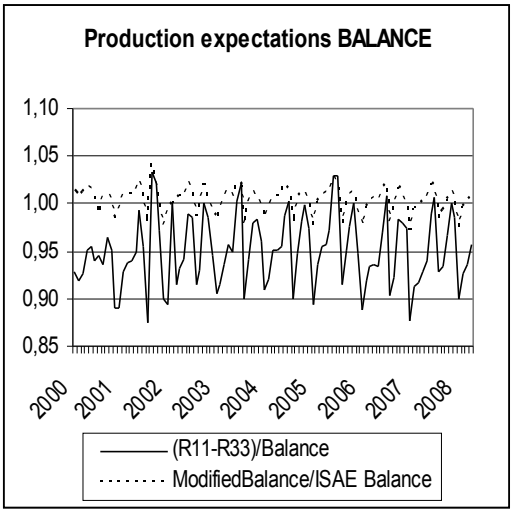

Current stock of finished products -
DOWN-
0,98
0,88
0,78
0,68
0,58
0,48
0,38
0,28
2000 2001 2002 2003 2004 2005 2006 2007 2008
R33/Down
ModifiedDown/ISAEDown

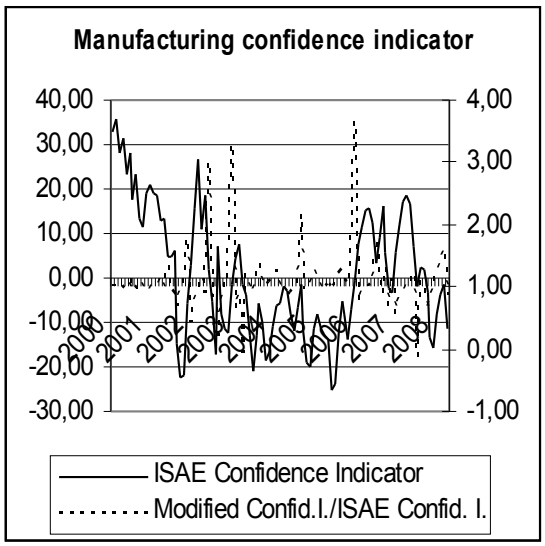

Current stock of finished products
BALANCE
1,05
1,04
1,03
1,02
1,01
1,00
0,99
0,98
0,97
0,96
2000 2001 2002 2003 2004 2005 2006 2007 2008
(R11-R33)/Balance
ModifiedBalance/ISAE Balance

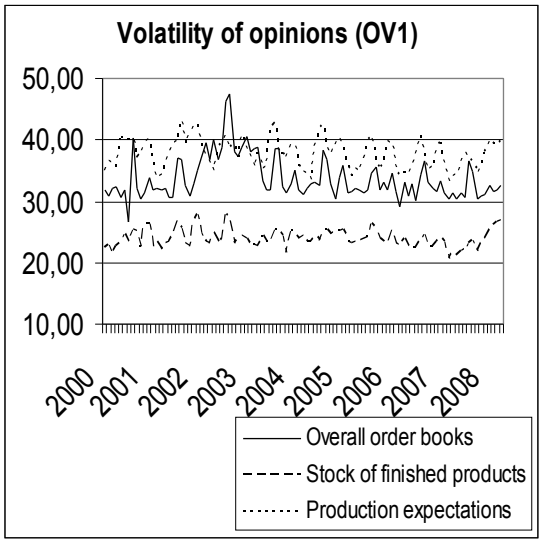

Production expectations -UP-
1,20
1,10
1,00
0,90
0,80
0,70
0,60
0,50
0,40
0,30
0,20
2000 2001 2002 2003 2004 2005 2006 2007 2008
R11/Up
ModifiedUp/ISAEUp

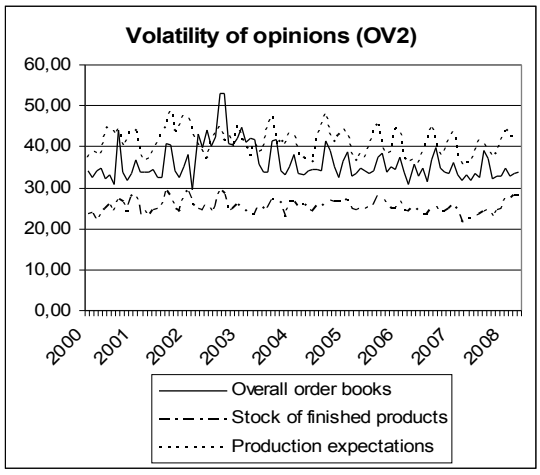

Production expectations -SAME-
1,15
1,05
0,95
0,85
0,75
0,65
0,55
2000 2001 2002 2003 2004 2005 2006 2007 2008
R22/Same
ModifiedSame/ISAESame

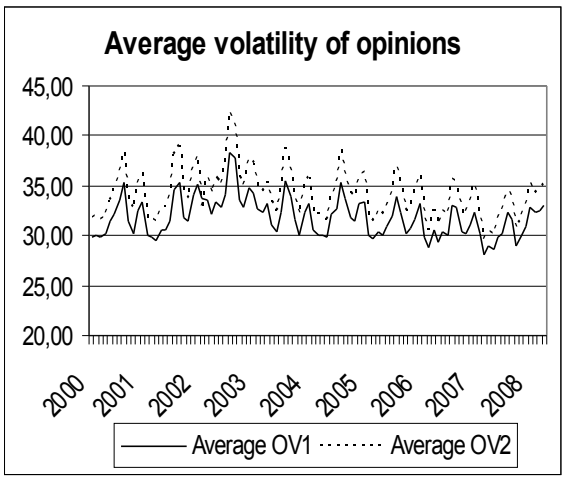

Production expectations -DOWN-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
2000 2001 2002 2003 2004 2005 2006 2007 2008
R33/Down
ModifiedDown/ISAEDown

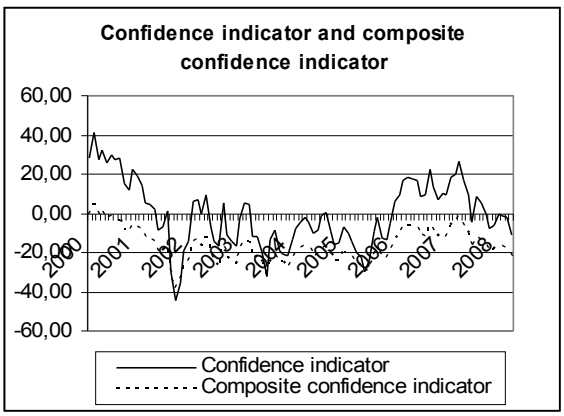

Production expectations BALANCE
1,10
1,05
1,00
0,95
0,90
0,85
2000 2001 2002 2003 2004 2005 2006 2007 2008
(R11-R33)/Balance
ModifiedBalance/ISAE Balance











We can see substantial differences between the ISAE and modified values, even if the moderate weight of the permanence indicator used for the rectification does not imply strong changes in the time path of the answers. The percent correction (dotted lines) is lower than the oscillation of the permanence indicators and the ratio (R11-R33)/balance (full lines) since the first also includes the remaining (non permanent) answers that do not contribute to the correction.

In particular, in the Figures 1 and 3 (for Up and Down), the correction percentage oscillates around 20 percent, but with a substantial dispersion as an effect of the high dispersion of R_{11}/Up and R_{33}/Down (respectively between 0,8 0,2, and 0,8 0,4). Figure 2 shows a correction percentage higher than 1 due to the higher value of R_{22}/Same than those of R_{11}/Up and R_{33}/Down. The dispersion is lower than in Figures 1 and 3 due to the fact that R_{22}/Same is much less uneven than R_{11}/Up and R_{33}/Down.

Figures from 5 to 8 (for current stock of finished products) and from 9 to 12 (for production expectations) show, with respect to the overall order books, an accentuation of the difference between current and corrected data series with reference to Same and balances

The use, for rectification, of the permanence indicator 2 should imply some refinement.

The two kinds of volatility (OV1 and OV2 given by expressions 4 and 5 in section 1) do not differ substantially. The strong difference between the behaviour of volatility and the usual confidence indicator informs us that the two variables may play a different role in the explanation of the economic process.

The behaviour over time of the composite confidence indicator shows substantial differences from that of the usual confidence indicator.

3.3) Some additional applications concerning the permanence indicator and the corrections of Up, Same and Down by giving a double weight to R_{ii} (the repeated answers)

The results that will follow concern three questions of the harmonised EU surveys, two of which express opinions and one expresses expectations[5]. The reference to opinions and expectations stresses the need to measure their volatility. But also the volatility of the answers concerning results, not considered in this paper, may be important under other respects.

The figures that follow flank, to the EU surveys results, those 'modified' or corrected according to the weight attributed to R_{ii}, i.e. the repeated answers. Here we give to these answers a *double weight* with respect to Up-R_{11}, i. e. the remaining ones. Therefore, the expression for the corrected (or modified) UP is:

$$\text{ModifiedUp} = (2R_{11} + \text{Up-}R_{11})/3, \text{ that is: } (\text{Up}+R_{11})/3$$

Of course, the correction of Same and Down must substitute, in the above expression, Same or Down to Up and R_{22} or R_{33} to R_{11} [6].

For making comparable the current percent of answers to their modified percents, the sum of the percent of the modified Up, Same and Down has been reported to 100 (i.e. the sum of the current

[5] An analogous application was performed on data for South Africa provided by Murray Pellissier and concerning four questions of the BER surveys on expectations. The results confirmed those below.

[6] If the weight of the repeated answer (R_{11}) is supposed, for instance, to be 3, the expression above becomes: (Up+2R_{11})/4.

If we use the expression 2 of the permanence indicator, giving to this a weight of two, we get the following expression for correction: (R_{11}+4R'$_{11}$+Up)/7. For the correction of Same and Down we have to substitute in the expression, respectively, Same or Down to Up and R_{22} or R_{33} to R_{11}.

percent modalities of answers) simply by dividing 100 by the sum of the percent of all modified answers and multiplying by the percent of each modified answer[7], i.e. according the proportion Modified Up : x = Σmodified(Up+Same+Down)] : 100, as well as for Same and Down

The figures in Appendix report:

d) The permanence indicator (expression 1 in section 3), i.e. a ratio the variability over time of which expresses the difference in the time path of the percentage of the repeated answers (not considered by the current computations on surveys) with respect to the total percent of the corresponding answers; it gives, therefore, the relevance of the correction we propose.

e) The ratio between the modified percent of answers and the usual percent of answers. The difference with respect to one of this ratio expresses the *percentage of correction*, i.e. the percent difference between the modified and current percentages.

f) The ratio (R11-R33)/balance, that gives the variation over time of the difference of the percent of persisting Up and Down (used for our corrections) with respect to Up minus Down, i.e. the usual balances. This ratio gives an idea of the impact on balances of our correction. Such correction is plainly expressed by the ratio between the modified balance and the usual one: (ModifiedUp–ModifiedDown)/(Up–Down).

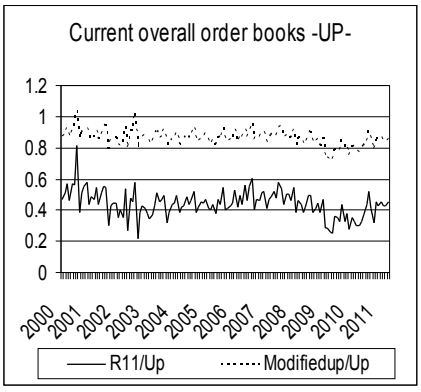
In the figures, the variable sub a) is indicated by the permanence indicators R11/Up; R22/Same; R33/Down. The variable sub b) is indicated by the ratios ModifiedUp/ISAEUp, ModifiedSame/ISAESame; ModifiedDown/ISAEDown. The variables sub c are indicated by (R11-R33)/balance and ModifiedBalance/balance.

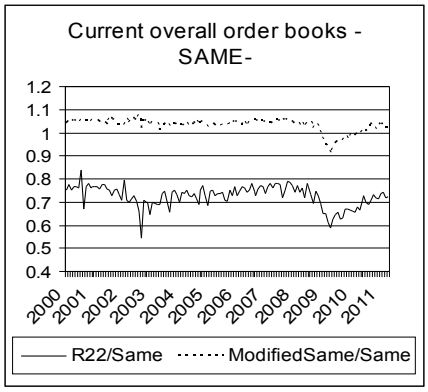
A constant of 100 has been added to R11-R33, Balance and modified balance in order to avoid negative numbers that would make meaningless the ratios under c and ModifiedBalance/Balance

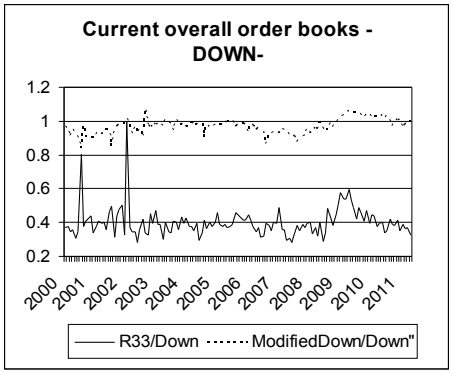
The data concern 11 years or, more precisely, 135 monthly periods of survey starting from February 2000.

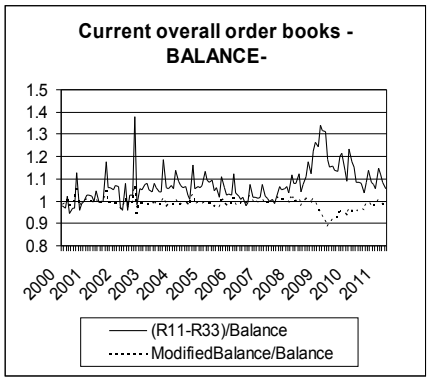
Figures

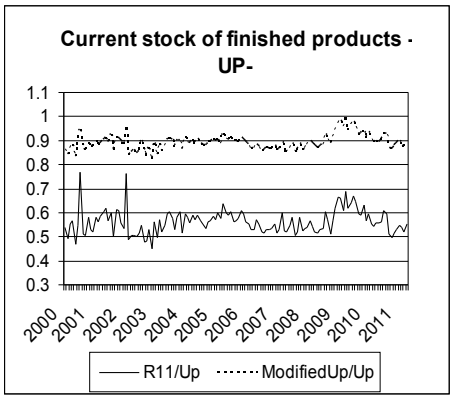
[7] In fact, [ModifiedUp/Σmodified(Up+Same+Down) + ModifiedSame/Σmodified(Up+Same+Down) + Modified Down/Σmodified(Up+Same+Down)]*100 = 100

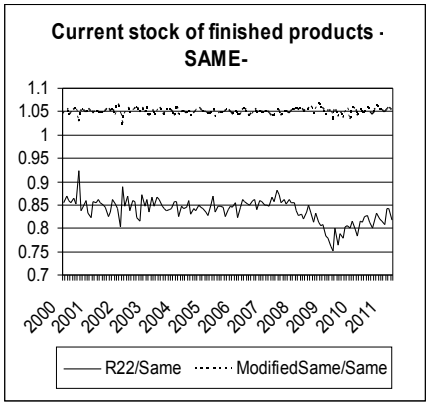

Current overall order books -UP-
1.2
1
0.8
0.6
0.4
0.2
0
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R11/Up
Modifiedup/Up

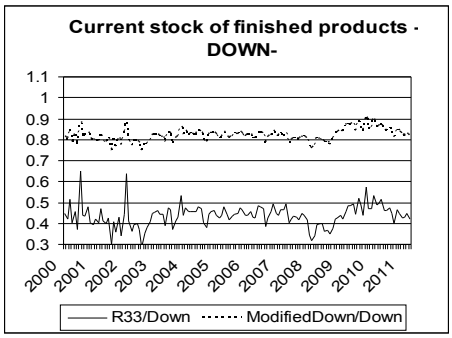

Current overall order books - SAME-
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R22/Same
ModifiedSame/Same

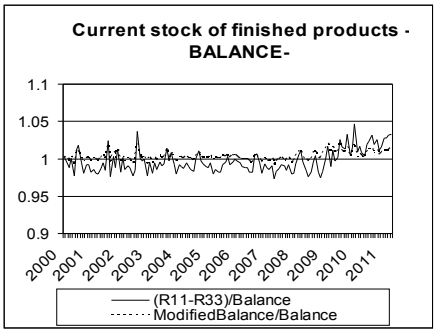

Current overall order books - DOWN-
1.2
1
0.8
0.6
0.4
0.2
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R33/Down
ModifiedDown/Down"

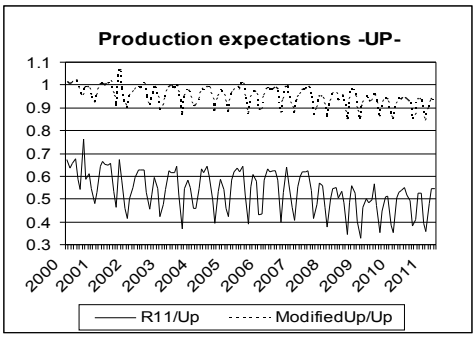

Current overall order books - BALANCE-
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
(R11-R33)/Balance
ModifiedBalance/Balance

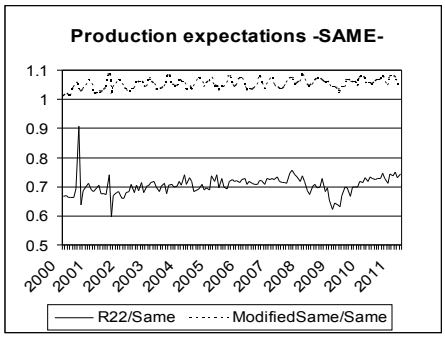

Current stock of finished products - UP-
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R11/Up
ModifiedUp/Up

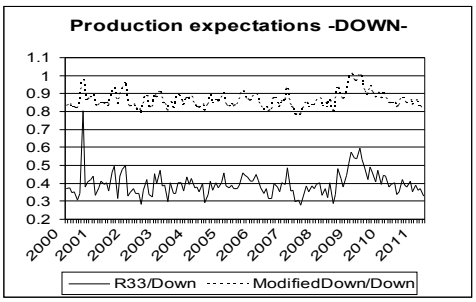

Current stock of finished products - SAME-
1.1
1.05
1
0.95
0.9
0.85
0.8
0.75
0.7
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R22/Same
ModifiedSame/Same

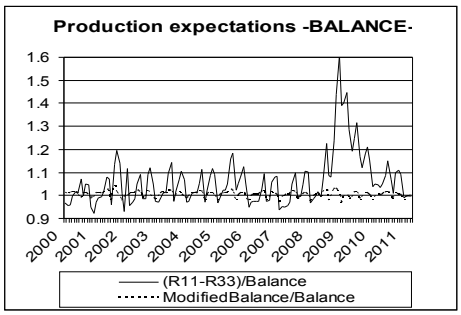

Current stock of finished products - DOWN-
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R33/Down
ModifiedDown/Down

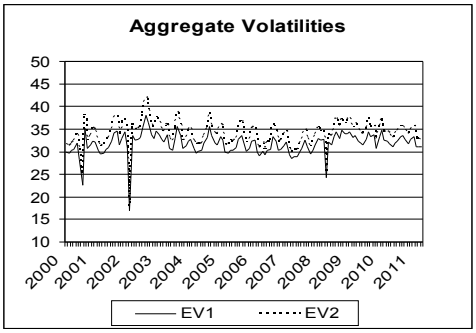

Current stock of finished products - BALANCE-
1.1
1.05
1
0.95
0.9
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
(R11-R33)/Balance
ModifiedBalance/Balance


Production expectations -UP-
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R11/Up
ModifiedUp/Up

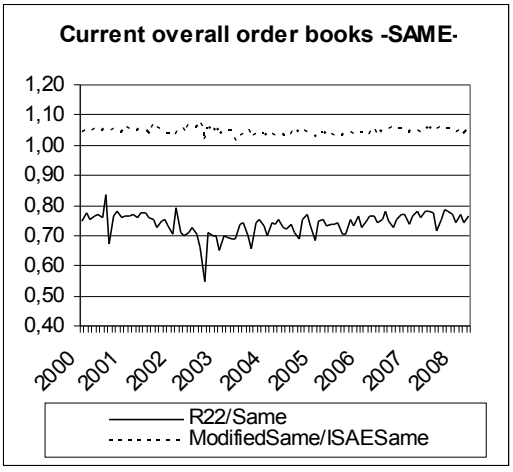

Production expectations -SAME-
1.1
1
0.9
0.8
0.7
0.6
0.5
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R22/Same
ModifiedSame/Same

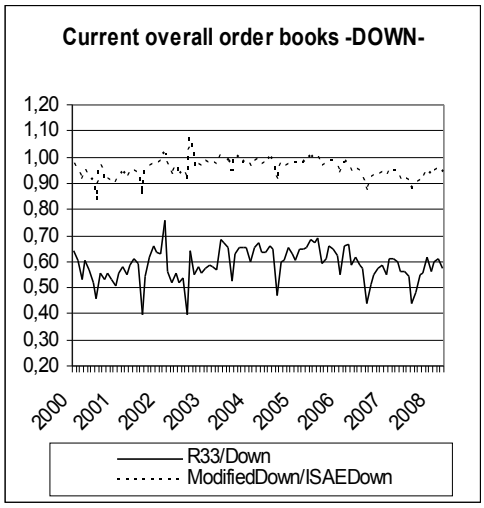

Production expectations -DOWN-
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
R33/Down
ModifiedDown/Down

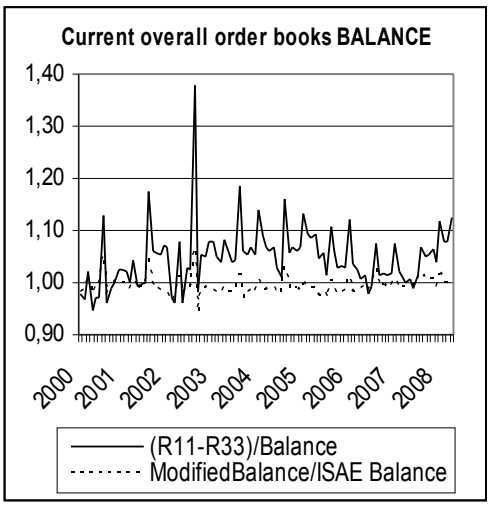

Production expectations -BALANCE-
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
(R11-R33)/Balance
ModifiedBalance/Balance

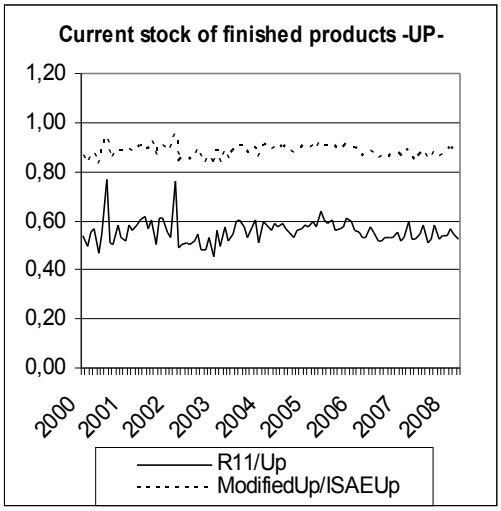

Aggregate Volatilities
50
45
40
35
30
25
20
15
10
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
EV1
EV2

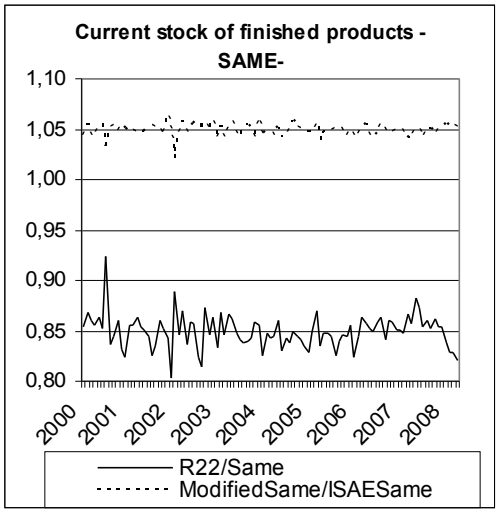
Figures

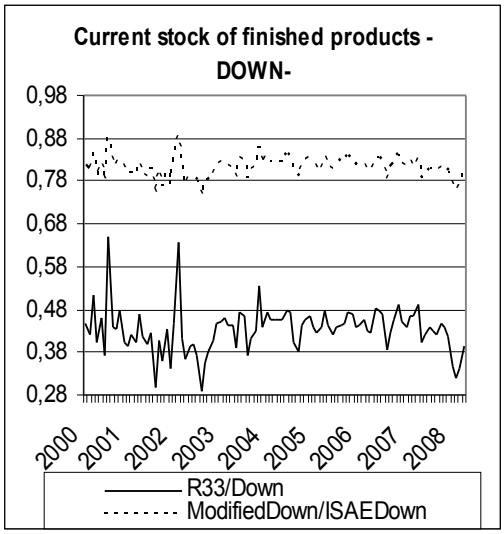

Current overall order books -SAME-
1,20
1,10
1,00
0,90
0,80
0,70
0,60
0,50
0,40
2000 2001 2002 2003 2004 2005 2006 2007 2008
R22/Same
ModifiedSame/ISAESame

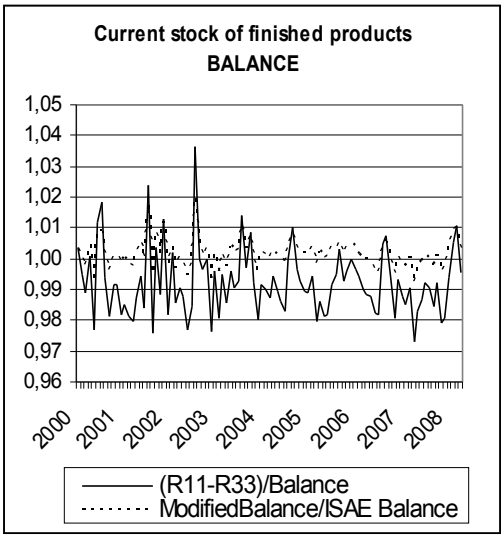

Current overall order books -DOWN-
1,20
1,10
1,00
0,90
0,80
0,70
0,60
0,50
0,40
0,30
0,20
2000
2001
2002
2003
2004
2005
2006
2007
2008
R33/Down
ModifiedDown/ISAEDown

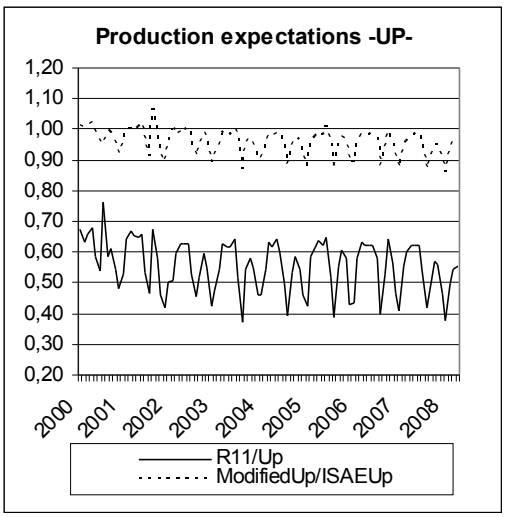

Current overall order books BALANCE
1,40
1,30
1,20
1,10
1,00
0,90
2000
2001
2002
2003
2004
2005
2006
2007
2008
(R11-R33)/Balance
ModifiedBalance/ISAE Balance

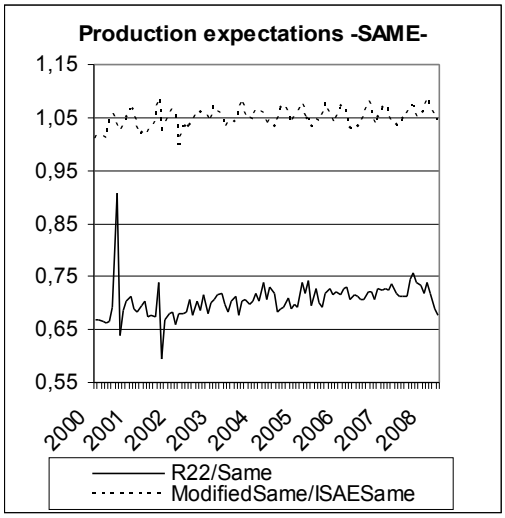

Current stock of finished products -UP-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
2000
2001
2002
2003
2004
2005
2006
2007
2008
R11/Up
ModifiedUp/ISAEUp

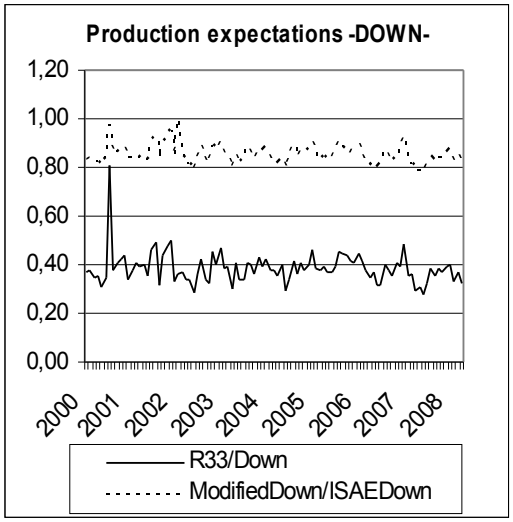

Current stock of finished products -
SAME-
1,10
1,05
1,00
0,95
0,90
0,85
0,80
2000
2001
2002
2003
2004
2005
2006
2007
2008
R22/Same
ModifiedSame/ISAESame

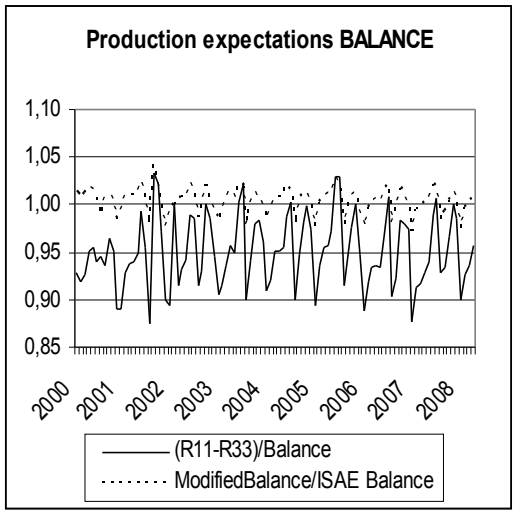

Current stock of finished products -
DOWN-
0,98
0,88
0,78
0,68
0,58
0,48
0,38
0,28
2000
2001
2002
2003
2004
2005
2006
2007
2008
R33/Down
ModifiedDown/ISAEDown


Current stock of finished products
BALANCE
1,05
1,04
1,03
1,02
1,01
1,00
0,99
0,98
0,97
0,96
2000
2001
2002
2003
2004
2005
2006
2007
2008
(R11-R33)/Balance
ModifiedBalance/ISAE Balance









From the figures in Appendix we can see substantial differences between the UE surveys ISAE values and the modified ones (that is attributing a double weight to the repeated answer R with respect to the remaining one, non repeated); but the moderate weight of the permanence indicator used for the rectification does not imply strong changes in the time path of the answers. The percent correction (dotted lines) is lower than the oscillation of the permanence indicators and the ratio (R11-R33)/balance (full lines) since the first also includes the remaining (non permanent) answers that do not contribute to the correction.

In particular, in the Figures 1 and 3 (for Up and Down), the correction percentage oscillates around 20 percent, but with a substantial dispersion as an effect of the high dispersion of R_{11}/Up and R_{33}/Down (respectively between 0,8 0,2, and 0,8 0,4). Figure 2 shows a correction percentage higher than 1 due to the higher value of R_{22}/Same than those of R_{11}/Up and R_{33}/Down. The dispersion is lower than in Figures 1 and 3 due to the fact that R_{22}/Same is much less uneven than R_{11}/Up and R_{33}/Down.

Figures from 5 to 8 (for current stock of finished products) and from 9 to 12 (for production expectations) show, with respect to the overall order books, an accentuation of the difference between current and corrected data series with reference to Same and balances

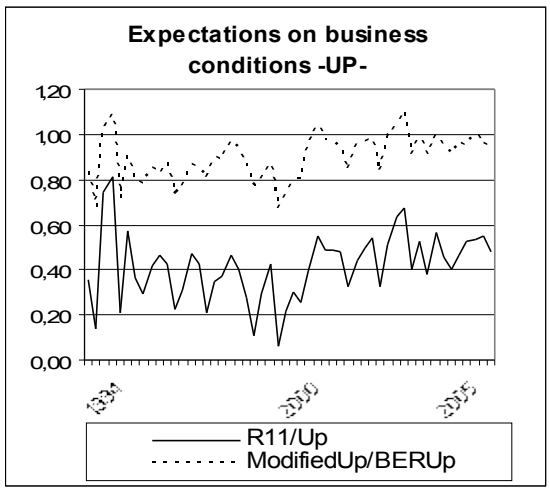
The use, for rectification, of the permanence indicator 2 should imply some refinement.

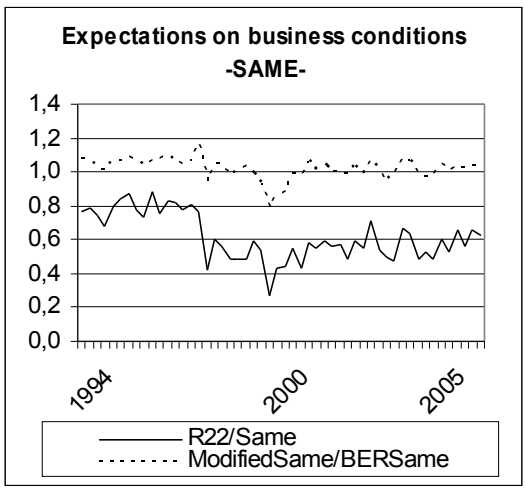
South Africa

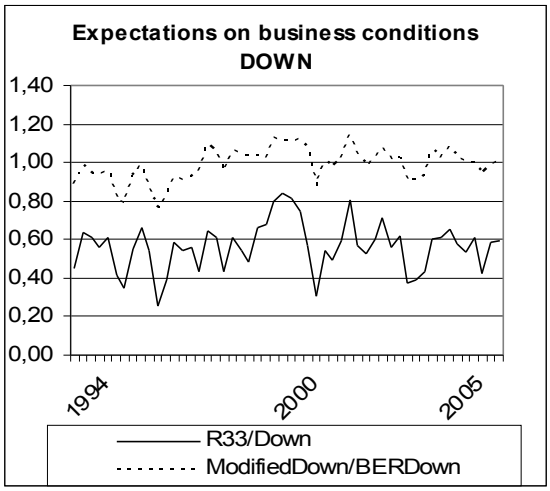
Now consider some identical applications that use the data provided by the BER quarterly survey for South Africa. Both BER elaborations and the modified ones use unweighted answers and go from 1993 to 2005. The questions this survey asks are different from those of the EU surveys and include also expectations on fixed investment, that ISAE surveys carry out every six months.

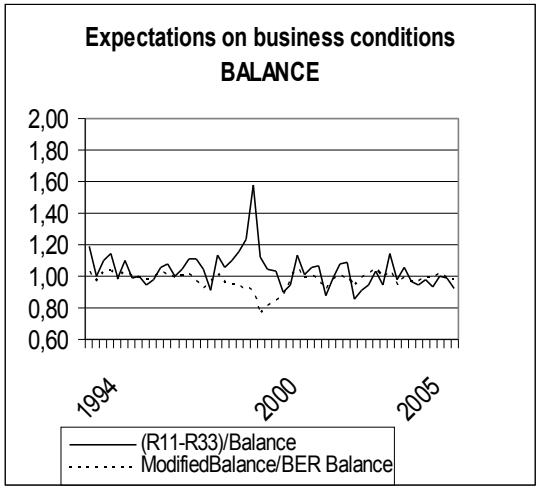
Note that the BER confidence indicator is quite different from the EU one; it is expressed by the following survey question: "How do you find current business conditions? Satisfactory/Unsatisfactory. The % of Satisfactory gives the BER confidence indicator. This question seems, in effect, appropriate to give a satisfaction indicator, not a confidence indicator that should have to do with expectations, as we shall see soon.

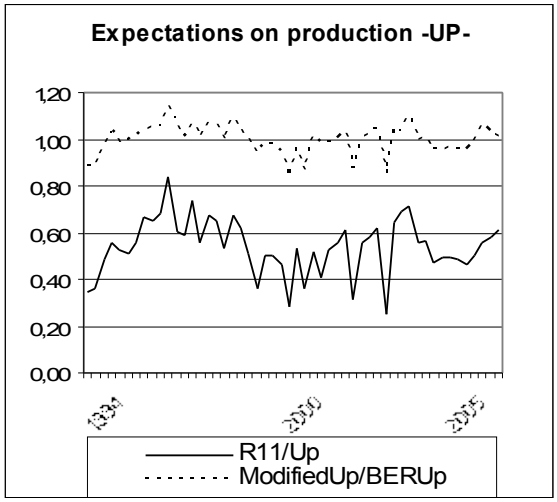
Figures:

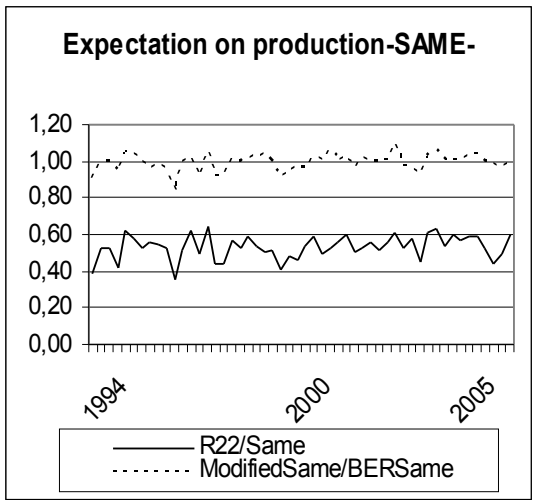


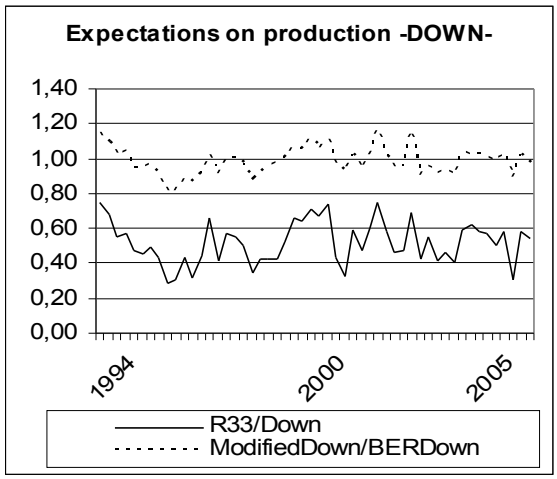


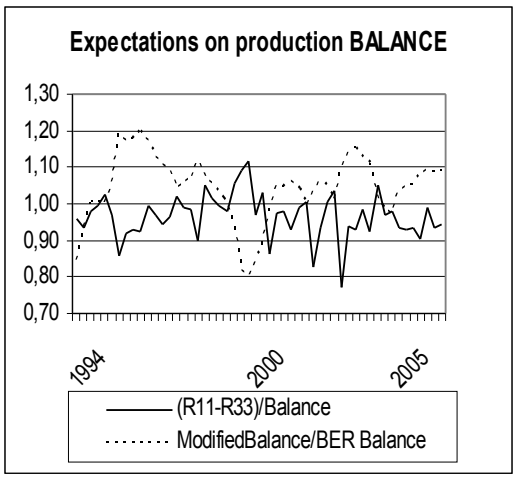

Expectations on business conditions
DOWN
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
1994
2000
2005
R33/Down
ModifiedDown/BERDown

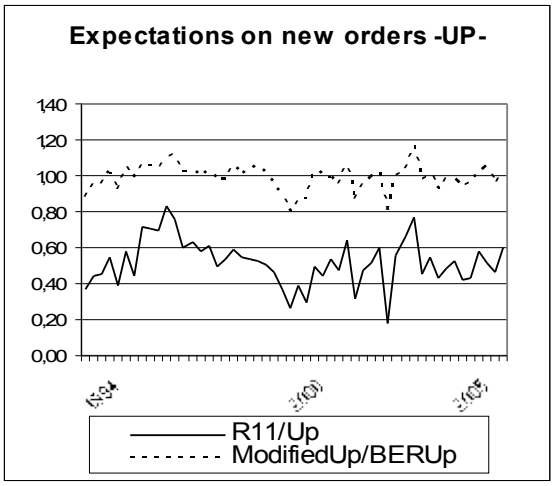

Expectations on business conditions
BALANCE
2,00
1,80
1,60
1,40
1,20
1,00
0,80
0,60
1994
2000
2005
(R11-R33)/Balance
ModifiedBalance/BER Balance

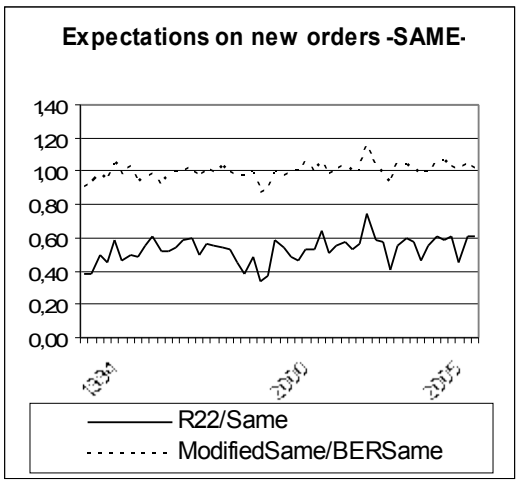

Expectations on production -UP-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
1994
2000
2005
R11/Up
ModifiedUp/BERUp

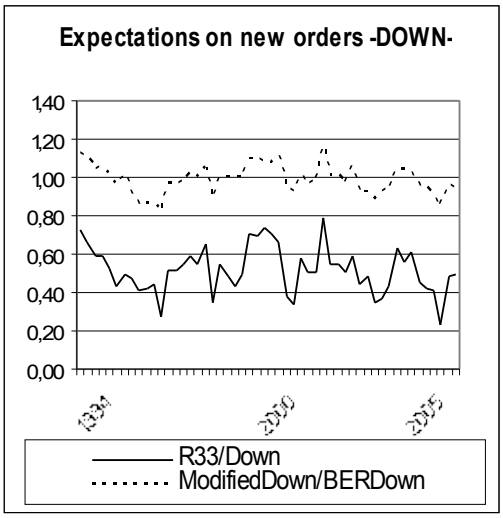

Expectation on production-SAME-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
1994
2000
2005
R22/Same
ModifiedSame/BERSame

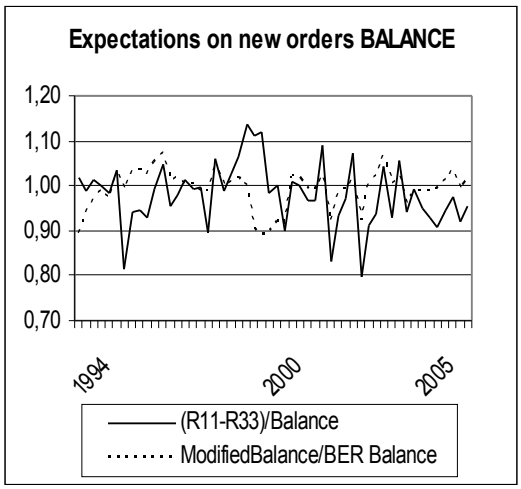

Expectations on production -DOWN-
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
1994
2000
2005
R33/Down
ModifiedDown/BERDown

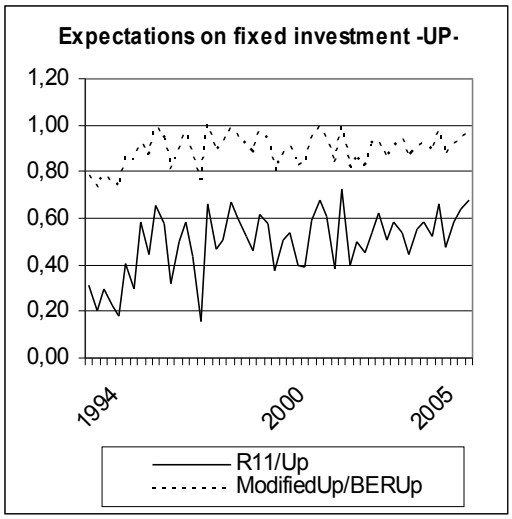

Expectations on production BALANCE
1,30
1,20
1,10
1,00
0,90
0,80
0,70
1994
2000
2005
(R11-R33)/Balance
ModifiedBalance/BER Balance

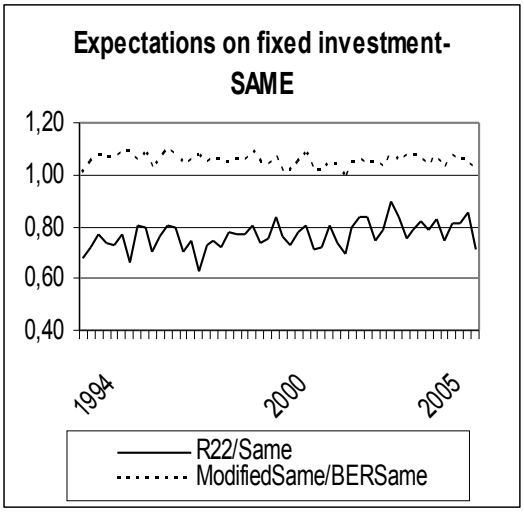

Expectations on new orders -UP-
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
R11/Up
ModifiedUp/BERUp

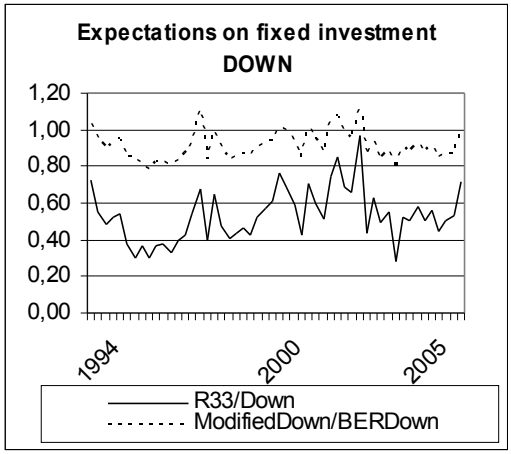

Expectations on new orders -SAME-
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
R22/Same
ModifiedSame/BERSame

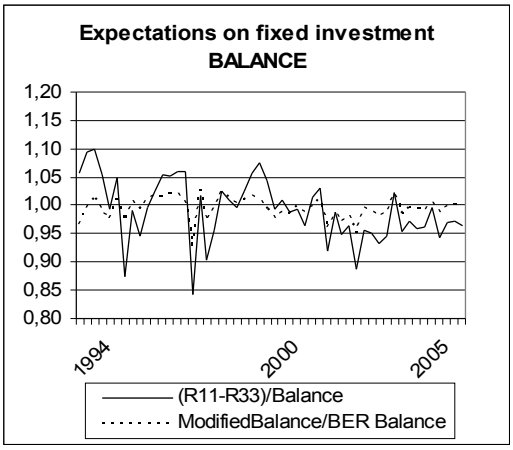

Expectations on new orders -DOWN-
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
R33/Down
ModifiedDown/BERDown

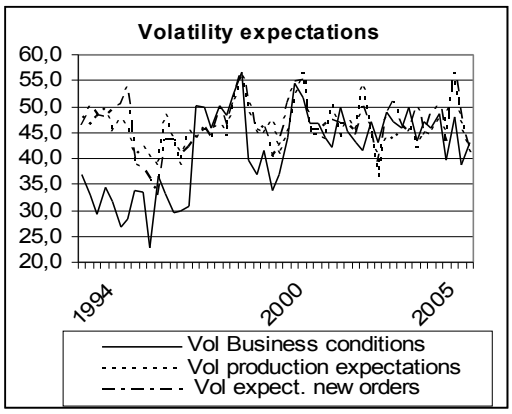

Expectations on new orders BALANCE
1,20
1,10
1,00
0,90
0,80
0,70
1994
2000
2005
(R11-R33)/Balance
ModifiedBalance/BER Balance

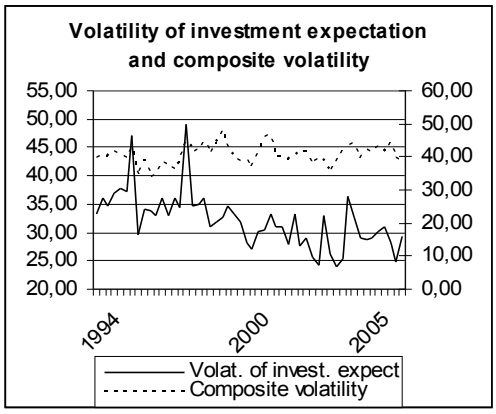

Expectations on fixed investment -UP-
1,20
1,00
0,80
0,60
0,40
0,20
0,00
1994
2000
2005
R11/Up
ModifiedUp/BERUp

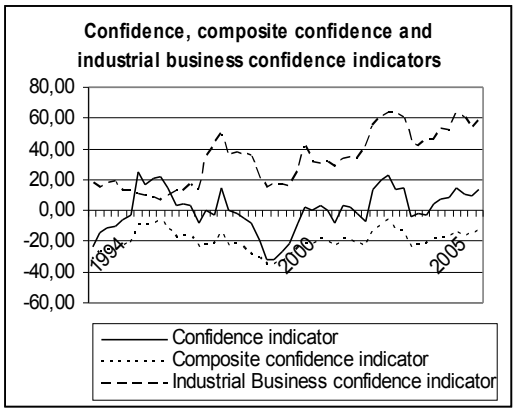

Expectations on fixed investment-SAME
1,20
1,00
0,80
0,60
0,40
1994
2000
2005
R22/Same
ModifiedSame/BERSame











The figures resulting from the application of our correction to the BER survey results show substantial differences between the BER percentages of answers and those calculated using the weights provided by the expression 1 for the permanence indicator. There is an increase, with respect to Italy, in the differences between corrected and current results. This is due to the quarterly cadence of the BER surveys that implies a larger unevenness over time of the permanence indicator, i.e., of the percentage of the repeated answers, and hence a larger oscillation of the percent correction of Up, Same, Down and balances. In sum, the

variation over time of the share of permanence on the percentage of each answer (permanence indicator) is remarkable, as well as the difference between the modified modalities of answers and the BER results. This means that the problem raised by our insistence on permanence is real and deserves attention. The most uneven are the expectations on business conditions, with a ratio between modified and BER balances oscillating around -0,2 and 1,6, and some peaks reaching 3,5, -1,2 and -3,0. The ratios between the modified and BER percentages of answers in general oscillates about a 20% of difference between the two, while the permanence indicator oscillates between 0,8 and 0,2. The ratio R22/Same is not far, in the average, from that for Up and Down, differently from ISAE data. This is probably due to the fact that, in monthly surveys, the number of respondents declaring Same is larger.

The behaviour of volatility largely differs for each answer. In particular, the volatility of expectations on investment greatly differs from the average (or composite) volatility given by the aggregation of the four questions here considered, plus sales. Besides, also in this case the behaviour of the volatility of expectations completely differs from that of the confidence indicator that, in some sense, should be opposite; therefore, they appear to be two different explanatory variables.

The last figure shows substantial differences among the BER Business confidence indicator, the confidence indicator derived from the arithmetical average of the expectations on the four considered variables, and the composite confidence indicator (i.e. including volatility).

3. Some econometric estimation and a further deepening on confidence indicators

Now we set out, using the considered data, some estimation of the relation between industrial production, volatility and confidence indicator. In fact, that indicator is usually referred to the behaviour of industrial production. The results are not completely satisfactory but may deserve some attention and seem to suggest an extension of regressions to the components of the confidence indicator.

The following adjustment equation has been estimated:

$$DIP = \alpha(\hat{I}P - IP)$$
$$\hat{I}P = \beta_1 CI - \beta_2 OV$$

Where:

IP = Variation of the index of industrial production
CI = Confidence indicator
OV = Aggregate Volatility
D is the derivative with respect to time
α is an adjustment parameter

The index of industrial production does not present a trend component, that otherwise should have been eliminated through some filter, for instance the Hodrick-Prescott one.

The results for Italy are:

Parameters	t-values
$\alpha = 4.38$	4.39
$\beta_1 = 2.34$	0.72
$\beta_2 = 2.36$	1.51

Carter –Nagar $R^2 = 0.68$

All parameters show the right sign. The above results consider raw IP data (adjusted for Easter, Christmas and August holidays); CI comes from ISAE non deseasonalised balances.

If volatility is incorporated into the confidence indicator, precisely in a more comprehensive confidence indicator giving the same weight to the usual confidence indicator and volatility, the results are:

Parameters	t-values
$\alpha = 4.36$	4.45
$\beta_1 = 5.35$	1.57

Carter-Nagar R^2 does not change

These results seem to justify a confidence indicator that incorporates volatility.

It should be interesting an econometric analysis of the relation between each component of the confidence indicator and the variation of industrial production, and then to add also volatility in the regression in order to see the degree of significance and explanatory contribution of each component. An estimation in this regard using non deseasonalised values has given wrong signs both for the current overall orders and the current stock of finished products; only expectations on production and volatility seem to have an explanatory meaning, with Carter-Nagar $R^2 = 0.73$.

This seems to raise the importance of some wide inquiry on the definition of the confidence indicator that also considers some other survey questions, mainly concerning expectations. In fact, the climate (or confidence) indicator should refer to expectations, but two of the three questions used for defining the EU confidence indicator do not concern expectations. More precisely, 'current overall order book' can be considered not sufficient by a respondent but a rise may be expected; or, vice versa, they can be considered more than sufficient but a decrease may be expected. The same can be said with reference to the expressed opinion on the stock of finished products. In sum, it seems evident that the confidence climate is marked by expectations, not the opinions on current situation. We think that the opinions (on the present situation) should be used to define an opinion indicator (of the current state of affairs), while expectations should be used to define confidence indicator. The usual

confidence indicator, being a hybrid one, seems not appropriate to express the state of confidence.

We limit, for the moment, to South Africa a major deepening on the profitableness of a confidence indicator built on expectations; in fact, the BER questionnaire shows a more systematic consideration of expectations and results

For South Africa, the estimation with the BER confidence indicator (that, as we know, is completely different from the EU confidence indicator) and aggregate volatility gives:

Parameters	t values
$\alpha = 1.78$	3.61
$\beta_1 = 0.38$	0.26
$\beta_2 = 1.78$	1.79
Carter –Nagar $R^2 = 0.48$	

The t value of β_1 (the parameter of the confidence indicator) is too much low but all parameters have the right sign. The estimation confirms that the BER confidence indicator has not to do with confidence climate. If the BER confidence indicator is replaced by the BER balance of the expectations on business conditions, modified with the weight provided by expression 1 of section I, the t value of β_1 improves substantially, as follows:

Parameters	t values
$\alpha = 2.03$	3.51
$\beta_1 = 2.64$	1.58
$\beta_2 = 1.52$	1.78
Carter –Nagar $R^2 = 0.50$	

If the modified BER balance of expectations on production is replaced by the BER balance of expectations on production, the t value of parameter β_1 becomes 1.44 and the remaining is almost the same.

We have defined, also for South Africa, a confidence indicator given by the arithmetic average of the balances of the four considered variables, and estimated the above regression using such indicator. The results are as follows:

Parameters	t values
$\alpha = 2.004$	3.52
$\beta_1 = 1.39$	1.58
$\beta_2 = 2.59$	1.46
Carter –Nagar $R^2 = 0.50$	

This seems indicate that a confidence indicator should be defined using the balances of expectations, not in the way suggested by the European Commission and computed on the harmonised EU surveys, or the way performed by BER.

Finally, we have built a composite confidence indicator including both balances and volatility, that is, obtained by subtracting aggregate volatility from the arithmetic average of the balances and attributing a same weight to the two components. The econometric estimation gives:

Parameters	t values
$\alpha = 1.97$	3.47
$\beta_1 = 6.82$	2.04
Carter –Nagar $R^2 = 0.48$	

Therefore, this last more comprehensive confidence indicator appears to be reliable,

Conclusion

This study points out the importance of some extensive deepening on survey results. The matter is dominated by well consolidated approaches. But a large space for research exists, that seems to promise the achievement of substantial improvements.

In particular, our results show, both for Italy and South Africa, the importance of distinguishing from (and flanking to) the current percent of answers that of the repeated ones. Also some weakness of the European industrial confidence indicator has been shown, as well as the inappropriateness of the BER confidence indicator to express the confidence climate. The definition of some hybrid confidence indicator, i.e. based both on respondents' opinions on the present situation and their expectations, as the EU harmonized surveys do, seems to be misleading. The building of both an opinion indicator (on the present state of affairs) and an expectations indicator should be more illuminating. Finally, it may be useful to warn that the changes over time in the questions of the harmonized EU surveys could reduce the possibility to calculate volatility (and hence radical uncertainty) and to inquiry on confidence indicator.

The ideas and applications proposed by this research are in a first stage and require additional refinements and extensions.

Some references to authors' works on BTS

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