

Table 1: Survey questions used by sector

Survey Question	Manufacturing	Construction	Trade	Services
Business Conditions	X	X	X	X
Activity	X	X	X	X
Employment	X	X	X	X
Profitability		X	X	X
Orders Placed	X		X	

Table 2: Possible Expectaion Errors

		$Q1A_{t+1}$		
$Q1P_t$		Better	Same	Poorer
	Better	0	-1	-2
	Same	1	0	-1
	Poorer	2	1	0

Sector				
Survey Question	Manufacturing	Construction	Trade	Services
Business Conditions	X	X	X	X
Activity	X	X	X	X
Employment	X	X	X	X
Profitability		X	X	X
Orders Placed	X		X	

Formally, one can define a  $k$ -period-ahead expectations measure of activity ( $C_t^k$ ) at time  $t$  as:  $C_t^k = E_t f(\Delta^h Y_{t+k})$ , where  $Y_{t+k}$  is a measure of real activity (usually output) at time  $t+k$  and  $\Delta^h Y_{t+k} = Y_{t+k} - Y_{t+k-h}$ . A common definition of  $f(\Delta^h Y_{t+k})$  relies on an up, unchanged, or down classification (e.g. Q2A in the BER survey asks about better, the same, or poorer conditions):

$$f_t(\Delta^h Y_{t+k}) = \begin{cases} -1, & \text{if } \Delta^h Y_{t+k} < 0 \\ 0, & \text{if } \Delta^h Y_{t+k} = 0 \\ 1, & \text{if } \Delta^h Y_{t+k} > 0 \end{cases}$$

An alternative would be to use a binary classification (e.g. Q1 in the BER survey asks about satisfactory or unsatisfactory conditions):

$$f(\Delta^h Y_{t+k}) = \begin{cases} 1, & \text{if } \Delta^h Y_{t+k} \geq a \\ -1, & \text{if } \Delta^h Y_{t+k} < a \end{cases}$$

where  $a$  is determined by the preferences of the agent.

Table 3: My caption

		$Q1A_{t+1}$		
$Q1P_t$		Better	Same	Poorer
	E(Better)	0	-1	-2
	E(Same)	1	0	-1
	E(Poorer)	2	1	0

Table 4: My caption

Q1At+1

	Better	Same	Poorer
E(Better)	0	-1	-2
E(Same)	1	0	-1
E(Poorer)	2	1	0

Table 5: Survey Questions used by Sector

Survey Question	Manufacturing	Construction	Trade	Services
Business Conditions	X	X	X	X
Activity	X	X	X	X
Employment	X	X	X	X
Profitability		X	X	X
Orders Placed	X		X	

In this chapter, a distinction is made between indicators of current conditions  $C_t^k$  when  $k = 0$ , and indicators of expected conditions  $C_t^k$  when  $k > 0$ . The confidence measure for current conditions  $C_t^0$  is referred to as ‘activity’, as it reflects confidence about the current quarter (in the second month of the quarter). The confidence measure for expected conditions  $C_t^1$  is referred to as ‘confidence’, as it reflects confidence about the following quarter.

As discussed above, confidence indicators are almost always based on balance statistics. This presents a single summary figure of responses to each question [Santero1996], which is the cross-sectional mean of survey responses if the standard quantification system is used: ‘better’ is quantified by +1, ‘the same’ by 0 and ‘poorer’ by -1. Confidence relating to current conditions, or activity  $C_t^0$ , and confidence relating to expected conditions, or confidence  $C_t^1$  may be defined as:

$$C_t^{CC} = \frac{1}{W_t} \sum_{i=1}^N w_{it} f_t(\Delta^4 Y_{i,t})$$

$$C_t^{EC} = \frac{1}{W_t} \sum_{i=1}^N w_{it} f_t(\Delta^4 Y_{i,t+1}),$$

where  $Y_{i,t+k}$  is again a measure of real activity at time  $t + k$  for firm  $i = 1, \dots, N$ ;  $\Delta^h Y_{i,t+k} = Y_{i,t+k} - Y_{i,t+k-h}$  for firm  $i$ ;  $w_i$  is the weighting that each firm receives; and  $W = \sum_{i=1}^N w_i$  is the sum of all the weights.

Table 6: Survey Questions used by Sector

Survey Question	Manufacturing	Construction	Trade	Services
Business Conditions	X	X	X	X
Activity	X	X	X	X
Employment	X	X	X	X
Profitability		X	X	X
Orders Placed	X		X	

Table 7: Concordance Statistics

	SARB Cycle				RGDP Growth cycle			
	Activity	Confidence	BER_BCI	SACCI_BCI	Activity	Confidence	BER_BCI	SACCI_BCI
lag=0	0.684**	0.653*	0.579	0.653*	0.768***	0.653**	0.663**	0.632**
lag=1	0.695**	0.705**	0.611*	0.684**	0.8***	0.684**	0.674**	0.558
lag=2	0.705***	0.716**	0.642*	0.716***	0.684***	0.674**	0.642**	0.505
lag=3	0.695**	0.705***	0.611*	0.695***	0.526	0.621*	0.568	0.463

In line with the @OECD recommendations, the weightings  $w_i = f_i s_j / F_j$  is the product of a firm size weight  $f_i$  for firm  $i$ , i.e. the inner weight reflecting turnover or number of employees, and a subsector weight  $s_j$  for subsector  $j$ , i.e. the outer weight reflecting the percentage share of total income or value added, divided by the total firm/inner weight for subsector  $j$ ,  $F_j = \sum_{i=1}^N f_i$ . For each question, the responses are weighted by firm and subsector size, and balances are calculated.<sup>1</sup>

These weightings are equivalent to an explicit 2-step weighting procedure, whereby weighted means (using firm size weights) are calculated for each subsector separately, and then aggregated with the subsector weightings. The BER uses similar weighting, except that the weighting equals the product of firm and subsector weights  $w_i = f_i s_j$ , but does not divide by the total firm/inner weight for the subsector  $F_j$ .

$$\begin{aligned}
\mu_t &= \frac{1}{W_t} \sum_{i=1}^N w_{it} f_t(\Delta^4 Y_{i,t}) \\
D_t &= \frac{\frac{1}{W_t} \sum_{i=1}^N (w_{it} f_t(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2}{\frac{1}{W_{t+1}} \sum_{i=1}^N (w_{it+1} f_{t+1}(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2} \\
D_t^1 &= \frac{1}{W_t} \sum_{i=1}^N (w_{it} f_t(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2, \\
D_{t+1}^0 &= \frac{1}{W_{t+1}} \sum_{i=1}^N (w_{it+1} f_{t+1}(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2 \\
D_t &= \frac{D_t^1}{D_{t+1}^0} \\
\epsilon_{it+1} &= f_{t+1}(\Delta^4 Y_{i,t+1}) - f_t(\Delta^4 Y_{i,t+1}), \\
\bar{\epsilon}_{it} &= \frac{1}{W_t} \sum_{i=1}^N w_{it} \epsilon_{it} \\
I_t &= \frac{1}{W_{t+1}} \sum_{i=1}^N (w_{it+1} \epsilon_{it+1} - \bar{\epsilon}_{t+1})^2 \\
A_t &= \bar{\epsilon}_{it+1}^2
\end{aligned}$$

<sup>1</sup>The weights for the construction and services subsectors were unavailable and therefore receive an equal weighting.

Table 8: Granger causality tests: confidence

<b>Granger causality H0:</b>	<b>statistic</b>	<b>p-value</b>
Confidence (Current) does not Granger-cause RGDP Growth	2.70*	0.07
RGDP Growth does not Granger-cause Confidence (Current)	1.41	0.25
Confidence (Expected) does not Granger-cause RGDP Growth	3.44**	0.03
RGDP Growth does not Granger-cause Confidence (Expected)	0.58	0.56
BER BCI does not Granger-cause RGDP Growth	4.14**	0.02
RGDP Growth does not Granger-cause BER BCI	1.69	0.19
SACCI Growth does not Granger-cause RGDP Growth	3.23**	0.04
RGDP Growth does not Granger-cause SACCI Growth	0.03	0.97

Table 9: Granger causality test statistics: sectoral confidence

<b>Granger causality H0:</b>	<b>Manufacturing</b>	<b>Construction</b>	<b>Trade</b>	<b>Services</b>
Confidence (Current) does not Granger-cause RGDP Growth	4.85***	9.88***	1.04	3.10*
RGDP Growth does not Granger-cause Confidence (Current)	3.23**	1.37	3.86**	0.42
Confidence (Expected) does not Granger-cause RGDP Growth	8.10***	11.19***	1.40	5.90***
RGDP Growth does not Granger-cause Confidence (Expected)	2.45*	0.00	6.01***	0.07
BER BCI does not Granger-cause RGDP Growth	3.79**	5.63**	0.60	
RGDP Growth does not Granger-cause BER BCI	3.01*	0.03	2.84*	

Table 10: Granger causality tests: uncertainty

<b>Granger causality H0:</b>	<b>statistic</b>	<b>p-value</b>
Dispersion does not Granger-cause RGDP Growth	3.57**	0.03
RGDP Growth does not Granger-cause Dispersion	1.25	0.29
Aggregate error does not Granger-cause RGDP Growth	7.28***	0.00
RGDP Growth does not Granger-cause Aggregate error	0.13	0.88
Idiosyncratic error does not Granger-cause RGDP Growth	1.20	0.30
RGDP Growth does not Granger-cause Idiosyncratic error	0.98	0.38
EPU does not Granger-cause RGDP_Growth	0.93	0.43
RGDP Growth does not Granger-cause EPU	1.93	0.13
SAVI does not Granger-cause RGDP Growth	1.26	0.29
RGDP Growth does not Granger-cause SAVI	1.01	0.36
Uncertainty (Combined) does not Granger-cause RGDP Growth	5.85***	0.00
RGDP Growth does not Granger-cause Uncertainty (Combined)	0.06	0.94

Table 11: Granger causality test statistics: sectoral uncertainty

<b>Granger causality H0:</b>	<b>Manufacturing</b>	<b>Construction</b>	<b>Trade</b>	<b>Services</b>
Dispersion does not Granger-cause RGDP Growth	7.50***	2.69	0.34	0.09
RGDP Growth does not Granger-cause Dispersion	1.76	0.01	0.46	4.54**
Aggregate error does not Granger-cause RGDP Growth	1.52	1.13	2.10	0.44
RGDP Growth does not Granger-cause Aggregate error	1.09	0.28	0.12	0.90
Idiosyncratic error does not Granger-cause RGDP Growth	3.18**	0.42	1.48	1.61
RGDP Growth does not Granger-cause Idiosyncratic error	1.14	0.57	0.73	2.33
Uncertainty (Combined) does not Granger-cause RGDP Growth	9.61***	2.99*	1.60	0.76
RGDP Growth does not Granger-cause Uncertainty (Combined)	1.35	0.02	0.87	1.59

Table 12: Factor loadings for the first principal component

Indicator	Loadings
Dispersion	0.55
Idiosyncratic error	0.00
Aggregate error	0.46
EPU	0.56
SAVI	0.41

Formally, one can define a  $k$ -period-ahead expectations measure of confidence ( $C_t^k$ ) at time  $t$  as:  $C_t^k = E_t f(\Delta^h Y_{t+k})$ , where  $Y_{t+k}$  is a measure of real activity (usually output) at time  $t+k$  and  $\Delta^h Y_{t+k} = Y_{t+k} - Y_{t+k-h}$ . A common definition of  $f(\Delta^h Y_{t+k})$  relies on an up, unchanged, or down classification (e.g. Q2A in the BER survey):

$$f(\Delta^h Y_{t+k}) = \begin{cases} -1, & \text{if } \Delta^h Y_{t+k} < 0 \\ 0, & \text{if } \Delta^h Y_{t+k} = 0 \\ 1, & \text{if } \Delta^h Y_{t+k} > 0 \end{cases}$$

An alternative would be to use a binary classification in levels (e.g. Q1 in the BER survey):

$$f(Y_{t+k}) = \begin{cases} -1, & \text{if } Y_{t+k} < a \\ 1, & \text{if } Y_{t+k} \geq a \end{cases}$$

where  $a$  is determined by the preferences of the agent. In this case  $a$  is the subjective benchmark or threshold that determines when conditions are ‘satisfactory’, and the measure of confidence simplifies to:  $C_t^k = E_t f(Y_{t+k})$ .

Table 13: Sample characteristics

Sector	Sample	Total Obs	Obs/Quarter	Response Rate	Missing Quarters
Manufacturing	1992Q1-2016Q3	36915	384.53	0.38	1997Q4,2000Q1,2005Q4
Construction	1993Q2-2016Q3	28139	312.66	0.22	1993Q4,1998Q3,2000Q2,2005Q4
Trade	1992Q2-2016Q3	40480	426.11	0.30	1992Q4,1993Q3,2005Q4
Services	2005Q2-2016Q3	13904	308.98	0.31	2005Q4
Total	1992Q1-2016Q3	119438	1218.76	0.25	2005Q4

Table 14: Correlations between confidence indicators and real GDP growth

	Confidence (Current)	Confidence (Expected)	BER BCI	SACCI Growth
Confidence (Current)				
Confidence (Expected)	0.92***			
BER BCI	0.93***	0.82***		
SACCI Growth	0.35***	0.48***	0.30***	
Real GDP Growth	0.78***	0.70***	0.75***	0.24**

Table 15: Correlations between sectoral confidence and real sectoral GDP growth

	Manufacturing			Construction		
	Confidence (Cur)	Confidence (Exp)	BER BCI	Confidence (Cur)	Confidence (Exp)	BER BCI
Confidence (Exp)	0.94***			0.89***		
BER BCI	0.92***	0.85***		0.94***	0.75***	
RGDP Growth	0.68***	0.68***	0.61***	0.74***	0.56***	0.76***
	Trade			Services		
	Confidence (Cur)	Confidence (Exp)	BER BCI	Confidence (Cur)	Confidence (Exp)	BER BCI
Confidence (Exp)	0.87***			0.76***		
BER BCI	0.90***	0.72***				
RGDP Growth	0.61***	0.59***	0.56***	0.76***	0.57***	

Table 16: Correlations between the uncertainty indicators

	Dispersion	Idiosyncratic_error	Aggregate_error	EPU	SAVI	Combined
Idiosyncratic_error	-0.15					
Aggregate_error	0.20*	0.18*				
EPU	0.14	0.08	0.09			
SAVI	0.06	-0.24**	0.07	0.28**		
Combined	0.64***	-0.10	0.54***	0.65***	0.56***	
RGDP_Growth	-0.44***	0.17*	-0.11	-0.30***	-0.11	-0.43***

Table 17: Correlations between the sectoral uncertainty indicators and real GDP growth

	Manufacturing				Construction			
	Dispersion	Aggregate	Idiosyncratic	Combined	Dispersion	Aggregate	Idiosyncratic	Combined
Aggregate	0.17*				0.39***			
Idiosyncratic	-0.28***	-0.02			-0.26**	0.17		
Combined	0.81***	0.46***	-0.69***		0.89***	0.73***	-0.27***	
RGDP	-0.30***	0.04	0.10	-0.22**	-0.18*	-0.17	-0.05	-0.19*
	Trade				Services			
	Dispersion	Aggregate	Idiosyncratic	Combined	Dispersion	Aggregate	Idiosyncratic	Combined
Aggregate	-0.01				-0.08			
Idiosyncratic	-0.22**	0.18*			-0.01	0.18		
Combined	0.58***	-0.56***	-0.81***		0.35**	-0.77***	-0.70***	
RGDP	-0.28***	-0.09	0.23**	-0.23**	-0.05	-0.19	0.29*	-0.06

Table 18: Concordance statistics with the SARB business cycle

	Confidence (Current)	Confidence (Expected)	BER BCI	SACCI BCI Growth
lead=3	0.60	0.62*	0.47	0.72**
lead=2	0.65*	0.67**	0.54	0.75***
lead=1	0.68**	0.70***	0.59*	0.76***
lead=0	0.71***	0.73***	0.62**	0.75***
lag=1	0.72***	0.74***	0.63***	0.70***
lag=2	0.73***	0.69***	0.64***	0.65***
lag=3	0.72***	0.64***	0.63***	0.6**

Table 19: Sample characteristics

Sector	Sample	Total Obs	Obs/Quarter	Response Rate	Missing Quarters
Manufacturing	1992Q1-2016Q3	36915	384.53	0.38	1997Q4,2000Q1,2005Q4
Construction	1993Q2-2016Q3	28139	312.66	0.33	1993Q4,1998Q3,2000Q2,2005Q4
Trade	1992Q2-2016Q3	40480	426.11	0.30	1992Q4,1993Q3,2005Q4
Services	2005Q2-2016Q3	13904	308.98	0.31	2005Q4
Total	1992Q1-2016Q3	119438	1218.76	0.33	2005Q4

Table 20: Comparing sample characteristics in terms of firm size

Firm Size Category	Full Sample		Forecast Error Sample	
	Observations	Percentage of sample	Observations	Percentage of sample
1	25,587	21.43%	14,537	20.88%
2	15,288	12.80%	9,079	13.04%
3	18,554	15.54%	10,936	15.71%
4	13,717	11.49%	8,094	11.63%
5	14,676	12.29%	8,748	12.57%
6	9,140	7.65%	5,331	7.66%
7	6,899	5.78%	3,980	5.72%
8	6,894	5.77%	3,739	5.37%
9	8,667	7.26%	5,166	7.42%

Table 21: Correlations between indicators based on the full sample and the stable sample

Indicator	Full-Stable Sample	RGDP Growth
Confidence (Current)	0.99***	0.76***
Confidence (Expected)	0.99***	0.68***
Dispersion	0.91***	-0.44***
Uncertainty (Combined)	0.96***	-0.31***

Table 22: Comparing sample characteristics in terms of firm size

Firm Size Category	Full Sample		Greater than 50% sample		Greater than 75% sample	
	Observations	Percentage	Observations	Percentage	Observations	Percentage
1	25,587	21.43%	5,504	18.67%	1,169	14.06%
2	15,288	12.80%	3,843	13.04%	1,232	14.82%
3	18,554	15.54%	4,328	14.68%	917	11.03%
4	13,717	11.49%	2,993	10.15%	724	8.71%
5	14,676	12.29%	4,888	16.58%	1,565	18.82%
6	9,140	7.65%	2,578	8.74%	867	10.43%
7	6,899	5.78%	1,819	6.17%	577	6.94%
8	6,894	5.77%	1,474	5.00%	491	5.90%
9	8,667	7.26%	2,053	6.96%	773	9.30%

Table 23: Correlations between the sectoral and reference series

	Q2A	Q2A_NExp	Q2A_2Exp	Q5A	Q5A_NExp	Q5A_2Exp
Food_Rval	0.30***	0.36***	0.30***	0.31***	0.36***	0.31***
Food_Dvol	0.07	0.05	-0.01	0.09	0.08	0.04
Text_Rval	0.10	0.18*	0.16	0.10	0.16	0.14
Text_Dvol	-0.06	-0.02	-0.05	-0.08	-0.03	-0.06
Wood_Rval	0.06	0.18*	0.17*	0.08	0.20**	0.21**
Wood_Dvol	0.05	0.10	0.08	0.11	0.15	0.16
Chem_Rval	0.33***	0.37***	0.42***	0.36***	0.39***	0.46***
Chem_Dvol	0.14	0.12	0.15	0.12	0.15	0.18*
Glass_Rval	0.11	0.05	0.13	0.08	0.03	0.08
Glass_Dvol	-0.02	-0.13	-0.02	-0.02	-0.12	-0.04
Metals_Rval	0.31***	0.32***	0.37***	0.41***	0.42***	0.44***
Metals_Dvol	-0.04	0.00	0.04	0.11	0.11	0.14
Elec_Radio_Rval	0.19*	0.29***	0.23**	0.16	0.26***	0.21**
Elec_Radio_Dvol	-0.05	0.12	0.11	-0.01	0.15	0.15
Motor_Rval	0.05	0.14	0.15	0.02	0.09	0.11
Motor_Dvol	0.07	0.13	0.12	0.06	0.10	0.08
Furn_Rval	0.20**	0.18*	0.19*	0.18*	0.12	0.12
Furn_Dvol	0.03	-0.01	-0.01	0.02	-0.05	-0.05

Table 24: Volatility of the sectoral series

	Q1A	Q1A_U	Q1A_New	Q1A_2s	Q3A	Q3A_U	Q3A_New	Q3A_2s
Food	35.81	22.77	24.00	26.79	35.76	20.65	23.21	25.05
Textiles	36.12	26.12	26.96	27.43	36.62	26.24	27.25	28.45
Wood	36.86	25.63	25.96	27.93	33.28	24.45	24.67	26.01
Chemicals	32.16	23.39	24.16	24.75	30.83	22.37	22.59	23.04
Glass	46.02	31.72	36.53	34.94	43.94	28.72	32.03	31.08
Metals	37.79	28.06	29.60	30.59	34.96	27.29	28.18	29.36
Elec_radio	50.29	33.03	48.84	48.98	49.30	33.03	49.23	50.63
Transport	55.88	32.70	38.78	43.61	52.29	32.52	38.30	41.92
Furniture	44.71	31.50	35.29	35.01	43.07	30.42	34.10	33.45