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

$Q1A_{t+1}$

		Better	Same	Poorer
	Better	0	-1	-2
$Q1P_t$	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

$Q1A_{t+1}$

		Better	Same	Poorer
	E(Better)	0	-1	-2
$Q1P_t$	E(Same)	1	0	-1
	E(Poorer)	2	1	0

Table 4: My caption

	Q1At+1		
	Better	Same	Poorer
Q1Pt 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 is 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 is 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 $i = 1, ..., N$; $\Delta^h Y_{i,t+k} = Y_{i,t+k} - Y_{i,t+k-h}$ 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.[1]

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.

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

$$D_t = \frac{\frac{1}{W_t} \sum_{i=1}^{N} (w_{it} f_t(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2}{\frac{1}{W_{t+1}} \sum_{i=1}^{N} (w_{it+1} f_{t+1}(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2}$$

$$D_t^1 = \frac{1}{W_t} \sum_{i=1}^{N} (w_{it} f_t(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2,$$

$$D_{t+1}^0 = \frac{1}{W_{t+1}} \sum_{i=1}^{N} (w_{it+1} f_{t+1}(\Delta^4 Y_{i,t+1}) - \mu_{t+1})^2$$

$$D_t = \frac{D_t^1}{D_{t+1}^0}$$

$$\epsilon_{it+1} = f_{t+1}(\Delta^4 Y_{i,t+1}) - f_t(\Delta^4 Y_{i,t+1}),$$

$$\bar{\epsilon}_{it} = \frac{1}{W_t} \sum_{i=1}^{N} w_{it} \epsilon_{it}$$

$$I_t = \frac{1}{W_{t+1}} \sum_{i=1}^{N} (w_{it+1} \epsilon_{it+1} - \bar{\epsilon}_{t+1})^2$$

$$A_t = \bar{\epsilon}_{it+1}^2$$

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[1] The weights for the construction and services subsectors were unavailable and therefore receive an equal weighting.

Table 8: Granger causality tests: confidence

Granger causality H0:	statistic	p-value
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

Granger causality H0:	Manufacturing	Construction	Trade	Services
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

Granger causality H0:	statistic	p-value
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

Granger causality H0:	Manufacturing	Construction	Trade	Services
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