$$1/B_1 = s_{11} + s_{22} + s_{33}) + 2\ (s_{12} + s_{23} + s_{13}) \quad (11)$$

and $$B_2 = \frac{1}{9}[(c_{11} + c_{22} + c_{33}) + 2\ (c_{12} + c_{23} + c_{13})] \quad (12)$$

As the crystal symmetry increases, these expressions reduce to simpler forms; for hexagonal, tetragonal, and trigonal crystals, they become simply:

$$1/B_1 = \frac{1}{D}\ [c_{11} + c_{12} + 2c_{33} - 4c_{13}] \quad (13)$$

and $$B_2 = \frac{1}{9}\ [2c_{11} + 2c_{12} + c_{33} + 4c_{13}] \quad (14)$$

where $$D = c_{33}\ (c_{11} + c_{12}) - 2c_{13}{}^2$$

Taking the first pressure derivative and arranging the result [6], we find

$$B_1' = (B_1/D)^2\ (c_{11} + c_{12} + 2c_{33} - 4c_{13})\ D'$$
$$- (B_1{}^2/D)(c_{11}' + c_{12}' + 2c_{33}' - 4c_{13}') \quad (15)$$

and $$B_2' = \frac{1}{9}\ [2c_{11}' + 2c_{12}' + c_{33}' + 4c_{13}'] \quad (16)$$

where $D' = (c_{11} + c_{12})\ c_{33}' + c_{33}\ (c_{11}' + c_{12}') - 4c_{13}\ c_{13}'$. It may be noted that the $c_{\mu\nu}$ are typically adiabatic values determined from ultrasonic measurements and the primes refer to their isothermal pressure derivatives.