$$b_2 = \frac{\sum\limits_{i=1}^{n}(p_i - \overline{p})(w_i - \overline{w})}{\sum\limits_{i=1}^{n}(w_i - \overline{w}^2)} = \frac{\sum\limits_{i=1}^{n}([\beta_1 + \beta_2 w_i + u_{pi}] - [\beta_1 + \beta_2 \overline{w} + \overline{u}_p])(w_i - \overline{w})}{\sum\limits_{i=1}^{n}(w_i - \overline{w}^2)} =$$

$$= \frac{\sum\limits_{i=1}^{n}(\beta_2(w_i - \overline{w})(w_i - \overline{w}) + (u_{pi} - \overline{u}_p)(w_i - \overline{w}))}{\sum\limits_{i=1}^{n}(w_i - \overline{w}^2)} = \beta_2 + \frac{\sum\limits_{i=1}^{n}(u_{pi} - \overline{u}_p)(w_i - \overline{w})}{\sum\limits_{i=1}^{n}(w_i - \overline{w}^2)}$$

$$(\Upsilon)$$