

2. DERIVATION OF COMPUTATIONAL FORMULAE

Basic relationship between the total final bill of goods—comprising deliveries to household, nonhousehold civilian, and military final demand—and the total outputs of the national and local industries, excluding households:

$$x = (I - A)^{-1}[h + q + m]. \quad (1)$$

Corresponding relationship between the original, total level of employment and the combined labor inputs indirectly absorbed by all national and local industries plus those directly entering final demand:

$$v = w'x + v_H + v_Q + v_M. \quad (2)$$

Relationship between the new final bill of goods and the new total level of employment that—by assumption—equals the original level of employment:

$$v = w'(I - A)^{-1}[\beta(h + q) + \alpha m] + \alpha v_M + \beta(v_H + v_Q). \quad (3)$$

Solution of the equation (3) above for β , with all other magnitudes appearing on the right-hand side considered as given:

$$\beta = \frac{v - \alpha[w'(I - A)^{-1}m + v_M]}{w'(I - A)^{-1}(h + q) + v_H + v_Q}. \quad (4)$$

Derivation of the new vector of the input coefficients of the household sector through adjustment of the original vector to the shift in the level of living:

$$c_o^* = c_o^* \cdot \beta. \quad (5)$$

Derivation of the new ⁵ total output levels of national and local industries, including households:

$$x^* = (I - A^*)^{-1}[\beta q^* + \alpha m^*]. \quad (6)$$

Derivation of the new regional outputs of national industries from their new total outputs:

$$X_N^R = \hat{X}_N P_N. \quad (7)$$

Derivation of the new regional outputs of local industries, including households:

$$X_L^{*R} = (I - A_{LL}^*)^{-1}[A_{LN}^* X_N^R + (\beta \hat{Q}_L^* D_Q^* + \alpha \hat{M}_L^* D_M^*)]. \quad (8)$$

The sum of the last two terms is a rectangular ($l \times r$) matrix each column of which represents the new combined military and nonhousehold civilian final demand for the products of local industries—including households—in one particular region. The multiplication of $\beta \hat{Q}_L^*$ by D_Q^* and $\alpha \hat{M}_L^*$ by D_M^* are analogous to that performed on the right-hand side of (7); it involves application of given sets of

⁵ Strictly speaking, a subscript should be used to distinguish old and new outputs.