where $\widetilde{MR}_j^i$ is perceived marginal revenue as defined above. Fulfillment of the second order conditions is discussed in the appendix. Sales to markets 2 and 3 are analogously determined. I assume that all firms serve all markets, giving rise to what Brander and Krugman (1983) have called "reciprocal dumping". This requires that without trade the oligopoly markups in all countries would exceed real trade costs. The comparative static properties of this equilibrium hinge upon the signs and magnitudes of the various partial derivatives of perceived marginal revenues. We can write the first order conditions in differentiated form as:

$$\begin{bmatrix} \left(\begin{matrix} \widetilde{MR}^1_{1,0} \\ +(n^1-1)\,\widetilde{MR}^1_{1,1} \end{matrix}\right) & n^2\widetilde{MR}^1_{1,2} & n^3\widetilde{MR}^1_{1,2} \\ n^1\widetilde{MR}^2_{1,2} & \left(\begin{matrix} \widetilde{MR}^2_{1,0} \\ +(n^2-1)\,\widetilde{MR}^2_{1,1} \end{matrix}\right) & n^3\widetilde{MR}^2_{1,2} \\ n^1\widetilde{MR}^3_{1,2} & n^2\widetilde{MR}^3_{1,2} & \left(\begin{matrix} \widetilde{MR}^3_{1,0} \\ +(n^3-1)\,\widetilde{MR}^3_{1,1} \end{matrix}\right) \end{bmatrix} \begin{bmatrix} \mathrm{d}q_1^1 \\ \mathrm{d}q_1^2 \\ \mathrm{d}q_1^3 \end{bmatrix}$$

$$= \begin{bmatrix} \mathrm{d}c^1 - \mathrm{d}s^1 \\ \mathrm{d}c^2 + \mathrm{d}t_e - \mathrm{d}s^2 \\ \mathrm{d}c^3 + \mathrm{d}t_n - \mathrm{d}s^3 \end{bmatrix}, \tag{5}$$

where we have exploited the assumption of complete symmetry within countries, and the assumption that all foreign sales (from whatever country) enter the revenue function of any domestic firm symmetrically (symmetric heterogeneity). In the above equations, subscript indices must be interpreted as with marginal revenues above, i.e., $\widetilde{MR}^i_{1,0} \equiv \partial\widetilde{MR}^i_1/\partial q^i_1$, $\widetilde{MR}^i_{1,1} \equiv \partial\widetilde{MR}^i_1/\partial\bar{Q}^i_1$, and $\widetilde{MR}^i_{1,2} \equiv \partial\widetilde{MR}^i_1/\partial Q^{k\neq i}_1$. Some of the results below are more readily understood in terms of aggregate changes. The above system may thus alternatively be expressed as

$$\begin{bmatrix} \mathrm{d}Q_1^1 \\ \mathrm{d}Q_1^2 \\ \mathrm{d}Q_1^3 \end{bmatrix} = [\mathbf{A}]^{-1} \begin{bmatrix} n^1(\mathrm{d}c^1 - \mathrm{d}s^1) \\ n^2(\mathrm{d}c^2 + \mathrm{d}t_e - \mathrm{d}s^2) \\ n^3(\mathrm{d}c^3 + \mathrm{d}t_n - \mathrm{d}s^3) \end{bmatrix}, \tag{6}$$