Military labor supply has usually been estimated econometrically using a log-log model, since with this structural form the coefficients on the dependent variable are all supply elasticities. Formally,

\[ \ln H = \beta \ln X \]  

(A.1)

where the dependent variable \( H \) represents high-quality enlistments, and \( X \) is a vector of dependent variables. First-generation studies estimated \( H \) controlling for relative military pay and youth unemployment. The second-generation studies updated the basic model by incorporating recruiter behavior, which is assumed to be driven by a utility function that depends on the total number of enlistments, quotas for high- and low-quality soldiers, and effort (\( E \)). The structural equation takes the following form:

\[ \ln H = \lambda \ln L + \beta \ln X + \ln E, \]  

(A.2)

where \( L \) measures low-quality enlistments, and \( \lambda \) gauges the relative difficulty of recruiting high-quality individuals. The variable measuring effort cannot be observed directly, but studies have assumed that effort is a function of recruiter performance relative to the quotas, or:

\[ \ln E = \gamma_1 \ln \left( \frac{H}{Q_H} \right) + \gamma_2 \ln \left( \frac{L}{Q_L} \right). \]  

(A.3)

where \( Q_H \) and \( Q_L \) are the quotas for high- and low-quality personnel, respectively. Incorporating equation A3 into equation A2 yields the following expression:

\[ \ln H = \alpha_1 \ln L + \alpha_2 \ln X + \alpha_3 \ln Q_H + \alpha_4 \ln Q_L. \]  

(A.4)

\[149 \] This appendix is based on Asch and Warner’s (1995) derivation of structural equations for estimating enlistment supply (pp. 355-56).
Given that $L$ and $H$ are jointly determined, Equation A4 is estimated using a two-step process that adopts the following low-quality recruit equation:

$$\ln L = \theta + \pi_1 \ln X + \pi_2 \ln Q_H + \pi_3 \ln Q_L$$  \hspace{1cm} (A.5)

Parameter estimates for equations A5 and A4 produce coefficients for A3, which in turn enables the parameters in equation A2 to be specified.