Welfare Estimation in a General Equilibrium Model with Cities

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Abstract : We first show that current measures of welfare changes in the whole economy do not apply to an economy with cities. In addition, since such measures are defined over a partial equilibrium, they capture only partially the effect of a welfare change. We then define a unique and additive measure that we term the modified economic surplus (mES) which fully captures the welfare effects caused by a change in the price of a nationally traded good. We show that the price change causes, on the one hand a change of land rents in the economy and, on the other hand, an equal change of mES that can be estimated by measuring areas in the price-quantity national demand and supply plane. We construct for each city a cost function from which we derive a city's and, after aggregation, an economy-wide demand and supply functions of nationwide prices and of either the unearned incomes (Marshalian functions) or the utility levels (compensated functions).