Total Factor Productivity - TFP

- Measures cost efficiency

- Considers all outputs and all inputs

- Rich history in assessing firm performance in all modes (air, rail, truck, transit)

- can decompose TFP into three sources of productivity improvement:
    - (1) efficiency gains from utilizing scale,
    - (2) efficiency gains from reducing inefficiency and
    - (3) gains from adopting new technologies

Data Envelopment Analysis DEA

- Creates an efficiency frontier to compare the performance of firms

- Used in developing benchmarking for a number of different industries

- Can be used in conjunction with regression techniques to identify underlying cost or performance drivers

- Sometimes used with stochastic frontier production functions

- Excellent technique to be used with limited data or where there is some emphasis on physical relationships

Factor Analysis

- Used to develop performance metrics (e.g. Gillen & Hansen 1999 on delay costs)

- Used to collapse a number of factors into a smaller subset of 'relevant' factors using linear combinations

- Useful when trying to bundle like factors when data are limited – bundled indexes used in subsequent cost or productivity regression

Hedonic Methods

- Used to unbundle products or output into key characteristics (e.g. cars, housing courier service)

- In demand analysis used to establish the value of a characteristic (e.g. value of reliability)

- In cost analysis used to establish affect on costs of change in value of a characteristic (e.g. reduce transit delay through zone)

- Use with total or variable cost function estimation to distinguish production technology features (e.g. scale) from the configuration of output (minimize flight miles per flight)