Agglomeration Economies

ECON 492E, TEAM 3
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Purpose

Develop a methodology and calculate the wider economic benefits of connecting UBC to the region with rapid transit
Benefits from Localization (Graham et al.)

1. Pooling labor resources
2. Knowledge sharing and transfers
3. Sharing of intermediate inputs
Consumption benefits from increased availability.
Benefits from Urbanization (Graham et al.)

1. Increase in the size of labor markets
2. Access to more public services
3. Increase availability in consumption
Entrepreneur living in an isolated area of the region
The entrepreneur opens up a business
A rapid transit scheme is implemented
Workers begin to relocate resulting in densification
The size of local labor market increases
Urbanization economies
Localization economies
Agglomeration economies
Region of Analysis (UBC-B-C)
Percentage of Vancouver Business Counts Located In The Corridor

<table>
<thead>
<tr>
<th>Industry</th>
<th>Corridor</th>
<th>Rest of Vancouver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care and Social Assistance</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>High Technology</td>
<td>0.25</td>
<td>0.75</td>
</tr>
<tr>
<td>All Other Industry</td>
<td>0.2</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Cost Benefit Analysis (CBA) on UBC-B-C

- CBA conducted by TransLink was a conventional Surplus based computation

- CBA doesn’t includes agglomeration localization and urbanization benefits
Agglomeration Benefits are Value Added into the CBA

Finding a number that represents these benefits in UBC-B-C after the potential project

Isn't an recommendation of the feasibility of the project.
Methodology

1. Calculating the Effective Density
2. Estimating Agglomeration Elasticities
3. Quantifying the Agglomeration Benefits Arising from the Transport Scheme
Calculating Effective Densities

The effective density (ED) represents the proximity between zone area in respect to its employment population.
Calculating Effective Densities

Equation:

\[
\text{Effective Density} = \frac{\text{Employment Level of a Particular Industry}}{\text{Generalized Travel Costs}}
\]

As General Transportation Costs fall...

Workers closer to each other

Higher accessibility

Workers may reallocate altogether

Jobs are brought closer together!
Estimating Agglomeration Elasticities

Agglomeration Elasticities - measure the relationship between how well connected an area is and how productive its workers are.
<table>
<thead>
<tr>
<th>Industry, Category</th>
<th>The Healthcare Industry, Service Industry</th>
<th>The High Technology Industry, Economy Industry</th>
<th>Other Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Agglomeration Elasticity (Median for all other Industries)</td>
<td>0.148</td>
<td>0.031</td>
<td>0.028</td>
</tr>
<tr>
<td>Range</td>
<td>-0.219, 0.503</td>
<td>-0.8, 0.25</td>
<td>-0.310, 0.3</td>
</tr>
</tbody>
</table>
Quantifying the Agglomeration Benefits Arising from the Transport Scheme

Superzone – a zone containing several lesser zones; a tool to simplify our calculations.
Benefits

$730 TO $860 MILLION ($2016)
NPV Of Benefits Over Time (Millions)

- Discount Rate 3.5%
- Discount Rate 5%
Health Care and Social Assistance Industry

Annual Impacts of Each Industry

- Other Industry: 11.7%
- High Technology: 1.8%

Health Care and Social Assistance Industry: 86.4%
Health Care and Social Assistance Industry

Forecasted Employment Levels (Thousands)

- Other Industry
- High Technology
- Health Care and Social Assistance
Limitations on Assumptions

- We assumed that Business Count Shares would represent levels of Employment
- We assumed that Generalized Travel Cost wouldn't change over time
- We assumed the Share of industry GDP in BC would be 1:1 with the Share of Industry GDP in Vancouver
- We used a Super zone instead of Traffic Zones
- Agglomeration Elasticity
Direction for Further Assessment of Wider Benefits

We recommend to:

• Use different agglomeration elasticities

• Look at the agglomeration economies outside of the corridor.

• Not to use superzone and look at individual sectors instead

• Try and forecast changes in generalized travel costs

• Conduct research that focuses on finding agglomeration elasticities that focus on the public sector
Thank you for listening!