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**Costs and Benefits of Regional Airport
Subsidies: A Computable General
Equilibrium Approach**

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Theme:

How to evaluate whether regional airport subsidies increase welfare, from a regional and national viewpoint

Approach:

- **Use CGE analysis to estimate impacts of extra expenditure generated on economic activity (GDP)**
- **Use measures of impacts on GDP to develop measures of benefit to enable a CBA of subsidy policy**

Outline

- **Airport subsidy issue**
- **Questions**
- **Measuring economic impacts and benefits**
- **Model and simulations**
- **Results**
- **Conclusions and implications**

Airport Subsidy Issue

- **European liberalisation generated LCC boom**
- **Smaller secondary airports able to handle extra traffic**
- **Local governments seek to attract extra economic activity (e.g. from tourism) to region**
- **Regional governments subsidise airports, which set charges low (or –ve)**
- **Charleroi case 2004- Ryanair forced to pay back subsidies**
- **Difficult policy dilemma for EU**

Subsidies- Pro and Con

- **Subsidies distort pattern of use- airlines do not use the least cost airport**
- **Subsidies often enjoyed by foreigners**
- **Can succeed in attracting extra economic activity**
- **If regional government wishes to spend its money in this way, why stop it?**
- **But- do subsidies negatively affect other regions?**

Jurisdictions

- **Region**
- **Nation**
- **Broader currency area- Eurozone**
- **EU**
- **Rest of World (RoW)**
- **Model used- region, nation, RoW**

Questions

- **Can a region gain from offering subsidies?**
- **How can the gain be evaluated?**
- **Do other regions lose- if so by how much?**
- **What is the overall national gain or loss?**
- **This involves:**
 - **Estimating the economic impact, and**
 - **Valuing the change in economic activity and comparing to costs**

Nature of the Paper

- **Illustrates a method- general, subject to data and modelling availability**
- **Based on a real economy, but for a hypothetical case**
- **Illustrates nature of plausible results**
- **Shows sensitivities to key assumptions**
- **Suggests short cuts when data or models are not available**

Cost of Subsidy

- **Normal deadweight loss- gain to consumers less than cost of subsidy**
- **Often, gainers will be “foreign”**
- **Subsidy will be financed out of extra taxes- cost of subsidy greater than amount of subsidy**
- **Increase in taxes could have adverse macro effect and dampen economic activity in region**

What Subsidies Do

- **Airport offers lower charges**
- **Airlines put more flights into airport**
- **May be attracted from a major airport nearby**
- **May be new flights(fewer flights to other regions, nations, or may be funded from reduced expenditure on other goods)**
- **Tourism to region increases- not all tourists just pass through**

Additional Expenditure into region

- **Additional airline related activity**
- **Additional freight activity**
- **Additional tourism activity**
- **Probably largest single effect**
- **Tourists come from other regions or RoW**

Impact on Economic Activity- A General Equilibrium Perspective

- **Extra expenditure leads to additional economic activity to meet demand**
- **Draw resources from other parts of the region**
- **Factor prices (eg wages) rise**
- **Some immigration into region?**
- **Other industries produce less**
- **May be able to draw on unemployment**
- **Typical case:**
- **A €100m increase in spending leads to a < €100m impact on GDP in region**
- **Impact on nation less than impact on region**

Increased International Tourism

- **Suppose a net increase in inbound tourism-exports rise**
- **Exchange rate rises**
- **Other exports fall; imports rise**
- **Other trading industries crowded out**
- **Net rise in economic activity zero or small relative to increase in expenditure**
- **Negative impacts on other regions and industries**
- **A classic case of Dutch Disease**

Measuring Gains from Increased Economic Activity

- **Change in GDP not a measure of change in welfare if additional inputs (land, labour, capital) needed**
- **Simple welfare measure- change in GNP, less cost of additional inputs needed**
- **How to cost labour- after tax real wage (full employment)**
- **Less if u nemployment present**

Sources of Gain

- **Extra economic activity (macro stimulation)**
- **Composition of output effect (more efficient use of inputs)**

Extra Activity

- **Positive effect on economic activity in region unless inputs are fixed**
- **In nation? Not much effect if there is full employment; positive effect if unemployment is present**

Compositional Effect

- **If no macro stimulation of output, any gain?**
- **Could gain from a more efficient mix of outputs**
- **Eg from a shift to a sector which is relatively highly taxed**
- **Tourism exports are relatively highly taxed- most exports are not taxed**
- **Thus a switch to tourism can have a positive effect on welfare**
- **Modelling confirms this (it could have been otherwise)**
- **Gain to region- need to know where increased taxes go**

CGE Approach

- **Regional economic impact analysis often uses Input –Output analysis**
- **Assumes free flow of inputs- no opportunity cost, no reduction in output elsewhere**
- **In reality, need to recognise resource scarcity, foreign exchange effects, crowding out of other industries**
- **I-O only valid as an Impact model only in a very local context**
- **Not for major regions or nations**
- **Often misused though**

CGE Models

- **Incorporate all industries, markets, links between them, consumer behaviour**
- **Foreign exchange markets**
- **Governments which tax and spend**
- **Allow for different assumptions about labour markets, unemployment, government budgetary policy**
- **Typically measure change in GDP, industry value added, employment, but not welfare**
- **Can be multi regional**
- **Exist for most countries and many regions of countries**
- **Now extensively used in analysis of government policy and shocks (eg oil shock)**

The Model

- **Sustainable Tourism Cooperative Research Centre Model**
- **Generic model, adapted with a detailed tourism sector**
- **50 industries other than tourism**
- **Inbound, outbound, interstate intrastate tourism etc**
- **One region, New South Wales, Rest of Australia, add to Australia**
- **Model of a real economy in the 2000s**

Simulations

- **Regional government offers \$1.5m in subsidy to airport**
- **Paid for be regional taxes**
- **Passed on to non regional passengers**
- **More (LCC) flights at airport, more passengers, more expenditure**
- **Region gains \$7.5m in extra tourism expenditure**

Scenarios

- **1 All extra expenditure switched from other region**
- **2 Extra expenditure from other regions and some extra international tourism**
- **3 All extra expenditure from reduced expenditure in other regions**
- **4 Extra expenditure from reduced expenditure in other regions and some extra inbound tourism**
- **5 All extra expenditure from extra inbound tourism**

Macro/ Labour Market Assumptions

- **A Unemployment in all regions**
- **B Fixed national employment**
- **C Fixed employment all regions**
- **D Fixed employment in host region; unemployment elsewhere**
- **E Unemployment in host region; fixed employment elsewhere**

Results

- **Consider impacts on GDP, welfare**
- **Factor in cost of subsidy, gain from subsidy (to other regions travellers)**
- **After tax real wage used as price of labour**

Case	Region	Other Regions	Nation
GDP/Gross Regional Product			
1A	+3.08	-6.34	-3.26
1B	+4.41	-4.36	+0.05
1C	+0.59	-0.53	+0.06
1D	+0.57	-6.31	-5.74
1E	+3.27	-0.52	+2.76
Real Welfare			
1A	+1.41	-2.50	-1.09
1B	+1.85	-1.82	+0.04
1C	+0.59	-0.53	+0.06
1D	+0.57	-2.50	-1.93
1E	+1.48	-0.52	+0.97

Labour Market Sensitivities Table 2

- **1 C (switch from other regions, tight labour market)- effects on welfare and GDP small**
- **1 D Shift economic activity away from depressed region- lower GDP, welfare for economy as a whole**
- **1 E shift economic activity towards depressed region- positive for region and nation**

Case	Region	Other Regions	Nation
GDP/Gross Regional Product			
1A	+3.08	-6.34	-3.26
2A	+2.86	-5.86	-3.01
3A	+2.32	-5.81	-3.49
4A	+2.25	-5.56	-3.31
5A	+1.42	-2.77	-1.35
Real Welfare			
1A	+1.41	-2.50	-1.09
2A	+1.34	-2.29	-0.95
3A	+1.33	-2.56	-1.22
4A	+1.31	-2.43	-1.13
5A	+0.86	-0.94	-0.07

Demand Scenarios

- **1 A (unemployment, switch from other regions)**
- **Region gains, others lose, nation loses GDP, welfare**
- **5 A Extra international tourism**
- **Region gains, others lose, nation loses**

Case	Benefit/Cost	Region	Other Regions	Nation
1B	Welfare	+1.85	-1.82	+0.04
	Subsidy	-1.50	0	-1.50
	Balance	+0.35	-1.82	-1.46
1C	Welfare	+0.59	-0.53	+0.06
	Subsidy	-1.50	0	-1.50
	Balance	-0.91	-0.53	-1.56
1E	Welfare	+1.48	-0.52	+0.97
	Subsidy	-1.50	0	-1.50
	Balance	-0.02	-0.52	-0.53
3E	Welfare	+1.32	-0.90	+0.43
	Subsidy	-1.50	+1.12	-0.38
	Balance	-0.18	+0.22	+0.05



Overall Welfare Balance

- **Factor in gains, cost of subsidy**
- **1 B Unemployment, switch from other regions plus more inbound tourism**
- **Region gains, others lose, nation loses**
- **1 C Unemployment, more tourism from other regions**
- **Region loses (subsidy cost) benefits to other (subsidy benefit) nation loses**

Conclusions

- **Possible for a region to gain from subsidy policy (even taking a conservative view of the benefits from extra economic activity)**
- **Impacts and benefits for other regions normally negative**
- **Balance for nation can be positive or negative- more often negative**
- **Results depend on the characteristics of the economy- is the labour market tight, or is there unemployment etc?**

Nature of the Results

- **Show how itWay of thinking about the issue**
- **With data about effects of subsidy, model, can do a real evaluation of a subsidy**
- **Without the model, can develop rules of thumb based on other model simulations**
- **Shows what the benefits and costs of airport subsidies can be, for region and nation can be done**

Implications

- **Can make good sense for the region to offer subsidies**
- **But this might not be positive for the nation as a whole**
- **Or the Eurozone members in Europe**
- **Policy issue: should the federal government override the regional government?**
- **EU- should the EU try to restrict subsidies by regional governments (Charleroi, Strasbourg etc)**