International Conference
on Climate Change Impacts on Tourism
Lisbon PT - Sept. 2007

Do snowmaking investments improve the financial situation of the cableway companies in the perspective of climate change ?

Camille Gonseth

Ecole Polytechnique Fédérale de Lausanne, Switzerland

Presentation outline

I. Introduction
II. Statistical model
III. The results
IV. Snowmaking impacts
V. Conclusions

I. Introduction

Context Method

Tourism is an essential activity in many mountain regions. Swiss Alps: 25-35% of GDP.

Cableway companies=backbone of the (winter) tourism sector/catalyst role on the economic activities.

Investment costs: 450’000 to 625’000 EUR/km

Operating costs: 30’000 to 50’000 EUR/km

Source: WSL

Reallocation of the authorities’ support towards snowmaking: since the mid-nineties, 20% of the federal/cantonal support given to the sector has been devoted to snowmaking projects.

I. Introduction

Context **Method**

- Statistical model – multiple linear regression model explaining the operating results.
- Estimates from the regression's coefficients.

Effects on the operating results

- Use of the former results with information about other private costs.

Effects on both the Cash Flow and the Net Income

- What would be the effects of further investments?

Effects of the forthcoming investments

II. Statistical model

i)EBITDA ii)Size and location iii)Accomodation iv)Facilities v)Natural snow

EBITDA= Earnings before interest, tax, depreciation and amortization

= Operating Revenues – Operating Costs

Operational performances of the companies are easier to compare.

<u>Natural logarithm is used:</u>

- EBITDAs are typically relative
- Large EBITDAs are likely to vary more than small ones

II. Statistical model

i)EBITDA **ii)Size and location** iii)Accomodation iv)Facilities v)Natural snow

Size of the ski area:

- Scale effect
- Possible scale economies due to large investments costs

Distance to the densely populated regions:

- Proportion of one day skiers can be important for some companies
- Densely populated regions in the vicinity of mountain regions: Zürich, Berne, Genève/Lausanne.

II. Statistical model

i)EBITDA ii)Size and location **iii)Accomodation** iv)Facilities v)Natural snow

Several variables describing the accomodation capacity of the ski resorts are necessary because:

- CH population: 75% of the days spent on the ski areas are linked to overnight stays
- CDA companies: 85% of the customers stay in the resort.
- The economic impacts of different kinds of accomodations are not the same.

II. Statistical model

i)EBITDA ii)Size and location iii)Accomodation **iv)Facilities** v)Natural snow

Transport facilities:

• For each transport facility, we have multiply its transport passenger flow by its difference in level. We have then computed the mean of these values for each ski area.

•The variable measures both the costs associated to the transport facilities and the attractivity of the ski area.

Snowmaking facilities:

• Foreseeable decreasing effects of these investments on the generated revenues → quadratic term

II. Statistical model

i)EBITDA ii)Size and location iii)Accomodation iv)Facilities **v)Natural snow**

- For each ski area, we compute the number of potential skiing days.
- Within the winter period, we made the distinction between

1/ days with at least 30 cm of natural snow cover during the peak periods and

2/ days with at least 30 cm of natural snow cover during the rest of the season.

III. Results

Point estimates Not significant variables

Partial effects for several variables:

For a one % increase

Variable	% change in EBITDA
Nbr of beds in the hotel industry	0.24%
Nbr of beds in the group accomodations	0.17%
Total ski trails' length (km)	0.50%
MPM	0.88%

III. Results

Point estimates

Not significant variables

The variables related to the natural snow conditions were not significant:

- In the cross section sample, it is questionable whether they vary sufficiently to affect values of the dependent variable.
- Accuracy problem (raw data of one meteorological station used to sum up the natural snow condition on one ski area)

IV. Snowmaking impacts

EBITDA Other Private Costs Potential

Return to snowmaking investments:

For a one km increase

Existing kilometers	% change in EBITDA
0 km	11.5%
10 km	8%
20 km	4.7%
….	….
40 km	-2.1%

IV. Snowmaking impacts

EBITDA **Other Private Costs** Potential

Interest payments:

Hyp: 25% of the financing through the bank loans
variable mortgage rate=5%

} 8’000 EUR/km (first year)

Depreciation:

Hyp: straightline depreciation on 25 years

} 25’000 EUR/km (each year)

Exemple: level of snowmaking >0 km?

EBITDA>70’000 EUR (Cash Flow enhancing)
EBITDA>280’000 EUR
or Total revenues>625’000 EUR (Net Income enhancing)

IV. Snowmaking impacts

EBITDA Other Private Costs **Potential**

For the companies of our sample, we can determine those for which new investments in snowmaking facilities will improve their financial situation.

→ economic advisability of forthcoming investments

Cash Flow enhancing	Net Income enhancing
87.5%	65%

For a sample of 80 companies

V. Conclusions

- Despite high operating costs, relying more on snowmaking has a positive effect on the operating results.
- However, this effect tends to decrease as the level of investments increases and can be negative at some point.
- Taking the other costs into account, we need to consider the size of the company in order to assess the effect of further investment in snowmaking.

V. Conclusions

• 12.5% / 35% of the companies will presumably not improve their Cash Flow / Net Income in case of additional investments.

• With regard to the net income, any investments or further investments in snowmaking would lead to worsen the financial results of the companies with less than 625’000 EUR of total revenues.

• However, further climate change means different operating revenues and costs: change in the tourism flows and increasing operating costs.

Any questions ?

Camille Gonseth

EPFL (Switzerland)

camille.gonseth@epfl.ch

+41/21.693.40.09