

# Using Datalab to Analyse Tourism Performance

## Project Summary

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# Tourism's Place in the Economy

- 100 years of contribution to exports and image
- The only example of durable export diversification in our short history
- The largest exported product - 16% of total  
(Agriculture - 52% of total)
- Asset and emissions intensive
- Distributes about 50% of its value to non-tourism suppliers

# Project History

- Tourism's 1<sup>st</sup> satellite account (1995)<sub>2000</sub> identified significant strategic issues for the economy and the tourism industry.
- Nothing was really known about industry performance: indeed, what was the industry comprised of?
- Anecdotal reports held tourism to be a poor economic performer – not investment friendly.

# Where this Project Started

- Tourism Strategy 2010 identified numerous objectives for Industry improvement.
- In 2001, Tourism Industry Association (TIANZ) selected several enterprise-orientated objectives
  - The objective of “*developing tools and templates to enhance tourism enterprise financial and economic sustainability*” was considered a priority
  - TIANZ was only able to specify the problem and it took several more years to secure funding and resources.

# Assembling Project Resources

- In 2004 TIA and the Ministry of Tourism (TMT) formed a partnership to work on the project.
- The Ministry became principal funder, TIA and its members secondary funders: a joint governance group was established to oversee the research provider - Lincoln University.
- The project examined three areas of tourism ‘economic sustainability’: Private sector, Public sector and NZ’s overall environment.
- My role involved researching private sector sustainability.

# Project: Tourism Yield

- The entire project became colloquially known as *'the tourism yield project'*
- Unfortunately, *'yield'* is a very elastic concept and its definitions frequently plagued the project – more so when it drifted into qualitative territory.
- However, private sector definitions remained more or less constant, and were founded in sustainability theory.

# Some Early Issues

- Data! Access to sufficient ‘credible’ enterprise data in order to assess private sector performance.
- Metrics! Bridging the gap between rigour and rhetoric. What exactly is financial and economic sustainability?
- Focus! Terminology and definitions needed to solidify. Concepts of economic-value-added were used.

# Statistics NZ Data Resources

- Published Annual Enterprise Surveys offered exactly the right type of data but were too aggregated.
- The SNZ Christchurch office recommended the ‘new’ Datalab facility as a means of accessing unit records
- An application to access unit records consistent with definitions of TSA tourism characteristic and tourism related industries was sponsored by TMT and we started work.

# Sustainability Theory

- Economic Sustainability combines long term **Pareto efficiency** and **intergenerational equity** from Production. (Welfare monotonicity).

$$W(t) \equiv \int_t^{\infty} U(c(\tau)) e^{-r(\tau-t)} d\tau$$

- Financial Sustainability: Legal definition: fully-allocated free cash flow must always be positive.

(Assets > Liabilities and debts settled when due)

**Economic Production calculated as Assets\*(Financial Yield-Cost of Capital)**

**Financial Yield (FY) calculated as (Free Cash Flow/Assets)**

**Cost of Capital is calculated from (Risk Adjusted Returns/Assets)**

# Environmental Variables

## Outputs & Benchmark States



- Enterprise Environmental Variables – From Datalab:
  - Revenue, Expenditure, SWWP\*, Interest, Depreciation, FTEs, Shareholder Funds, Liabilities, Taxation, Employment Costs. For years 1999-2003.
- Outputs and **B**enchmark States
  - (**O**) Value Added (VA) – the \$ contribution an enterprise makes towards labour, taxation and capital.
  - (**O**) Free cash flow (FCF) – the \$ contribution an enterprise/sector makes to capital.
  - (**O**) Financial Yield (FY) – Asset Efficiency Ratio
  - (**B**) Cost of Capital (CC) – the cost of money commensurate with lending/trading risk.
    - *Benchmarks establish Pareto Efficiency surrogates*

\*SWWP – salaries and wages to working proprietors



# Output Tableau

Output Sheet for  
J and H Moriarty Ltd  
Tourism - AES  
Table 1, 57K, ID  
GTE (random) by ANZSIC  
for Value  
All Tourism Characteristic and Related Industries  
1999

Samples #	57695	1999	2000	2001	2002	2003
Samples for all years	12861	32308	32341	29936	28186	27385
Valid Yields		22532	22084	20161	18388	17538
Valid Yields in Range ±30%						
Income Levels	50	100	200	400	800	1600
Capital Levels	50	100	200	400	800	1600
Income Levels	50	100	200	400	800	1600
Capital Levels	50	100	200	400	800	1600

Output & Confidentiality Controls

All Samples Income (\$K)	1999	2000	2001	2002	2003
>=0	6413	6447	6005	5140	5059
>50	4670	4490	4032	3496	3164
>100	4350	4065	3691	3401	3223
>200	3423	3452	3132	2959	2819
>400	1924	1941	1659	1691	1629
>800	667	658	576	578	587
>1600	274	258	266	275	253
>3200	231	181	195	194	183
>6400	256	222	230	249	197
>12800	343	345	375	405	424
Valid	22532	22084	20161	18388	17538
Unaccounted	0	0	0	0	0
All Samples Capital (\$K)	1999	2000	2001	2002	2003
>=0	4671	4812	4948	4147	4010
>50	6755	6512	5119	4289	3757
>100	4599	4280	4019	3851	3757
>200	2968	3064	2932	2808	2730
>400	1427	1456	1346	1366	1351
>800	649	624	481	528	529
>1600	347	413	347	360	348
>3200	388	343	313	340	336
>6400	257	258	311	318	310
>12800	342	320	344	380	407
Valid	22532	22082	20160	18387	17535
Negative capital	0	2	1	1	3
Total	22532	22084	20161	18388	17538

Outputs for Yields in the Range ±30%

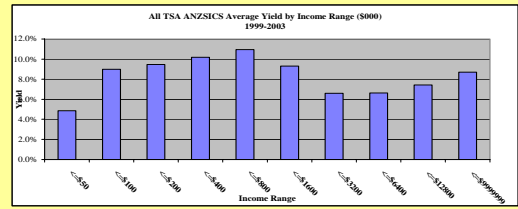
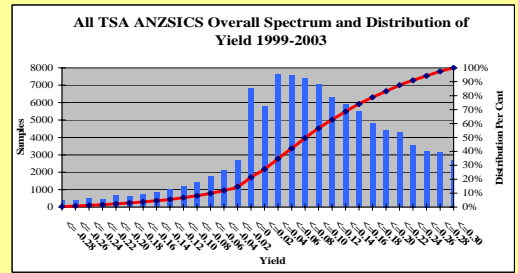
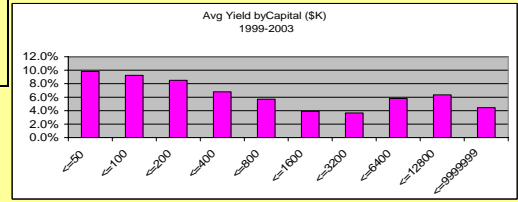
Average Yield by Income (\$'000)	1999	2000	2001	2002	2003	All Years	
>=\$0	<=\$50	4.73%	4.68%	4.43%	5.43%	5.01%	4.86%
>\$50	<=\$100	8.89%	9.14%	9.14%	8.94%	8.86%	8.99%
>\$100	<=\$200	9.75%	9.78%	9.34%	9.40%	9.06%	9.46%
>\$200	<=\$400	10.09%	10.15%	10.17%	10.45%	10.06%	10.18%
>\$400	<=\$800	10.46%	10.80%	10.96%	11.34%	11.25%	10.96%
>\$800	<=\$1600	9.05%	9.97%	9.24%	8.94%	10.04%	9.30%
>\$1600	<=\$3200	7.77%	6.34%	6.34%	6.46%	6.06%	6.60%
>\$3200	<=\$6400	7.73%	6.48%	6.46%	6.94%	5.53%	6.63%
>\$6400	<=\$12800	7.95%	7.26%	6.22%	7.73%	7.95%	7.42%
>\$12800	<=\$999999	9.02%	7.40%	8.23%	9.37%	9.46%	8.70%

Avg Yield by Capital (\$K)	1999	2000	2001	2002	2003	All Years	
>=0	<=\$50	9.70%	9.40%	9.68%	10.58%	9.67%	9.81%
>50	<=\$100	9.48%	9.48%	8.69%	9.21%	9.42%	9.26%
>100	<=\$200	8.17%	8.68%	8.33%	8.86%	8.51%	8.51%
>200	<=\$400	6.45%	6.59%	6.44%	7.16%	7.35%	6.80%
>400	<=\$800	5.44%	5.52%	5.89%	5.70%	5.89%	5.69%
>800	<=\$1600	3.76%	3.68%	3.86%	4.28%	3.95%	3.91%
>1600	<=\$3200	4.29%	3.45%	3.49%	4.13%	2.91%	3.65%
>3200	<=\$6400	6.25%	5.52%	5.81%	6.16%	5.25%	5.80%
>6400	<=\$12800	6.64%	5.92%	5.75%	6.81%	6.55%	6.34%
>12800	<=\$999999	4.00%	3.81%	4.15%	4.82%	5.43%	4.44%

All Tourism Characteristic and Related Industries

Yield Statistics	1999	2000	2001	2002	2003	All
Samples	22532	22084	20161	18388	17538	
Average	8.16%	8.18%	7.97%	8.44%	8.17%	8.19%
95% Conf ±	0.15%	0.15%	0.16%	0.17%	0.17%	0.16%
Variance	1.31%	1.33%	1.34%	1.33%	1.37%	1.34%
Std Dev	11.46%	11.52%	11.56%	11.52%	11.71%	11.55%
Max	30.00%	30.00%	30.00%	29.99%	30.00%	30.00%
Min	-30.00%	-30.00%	-30.00%	-30.00%	-30.00%	-30.00%
Decile 1	-6.53%	-6.58%	-6.84%	-6.32%	-6.84%	-6.62%
2	-1.49%	-1.51%	-1.75%	-1.25%	-1.69%	-1.54%
3	2.15%	2.14%	1.91%	2.40%	2.03%	2.13%
4	5.25%	5.26%	5.05%	5.53%	5.20%	5.26%
5	8.16%	8.18%	7.97%	8.44%	8.17%	8.19%
6	11.06%	11.10%	10.90%	11.36%	11.13%	11.11%
7	14.16%	14.23%	14.04%	14.49%	14.31%	14.24%
8	17.80%	17.88%	17.70%	18.14%	18.02%	17.91%
9	22.84%	22.95%	22.79%	23.21%	23.17%	22.99%

(Assuming a Normal Distribution of Yields)



AUDITS

OUTPUT SHEET

J. P. Moriarty

# EXCEL Issues.

- Statistics for Tourism Dataset
  - Largest Raw Dataset 57,000 records
  - Typical Raw Dataset Size ~ 1000 records
  - Processing Time ~ 2 sec<sub>min</sub>, <10sec<sub>avg</sub>, 1 Hour<sub>max</sub>.

## Benefits

- Object-like outputs
- Single Output Tableau
- Local Data (No Network)
- Repeatability

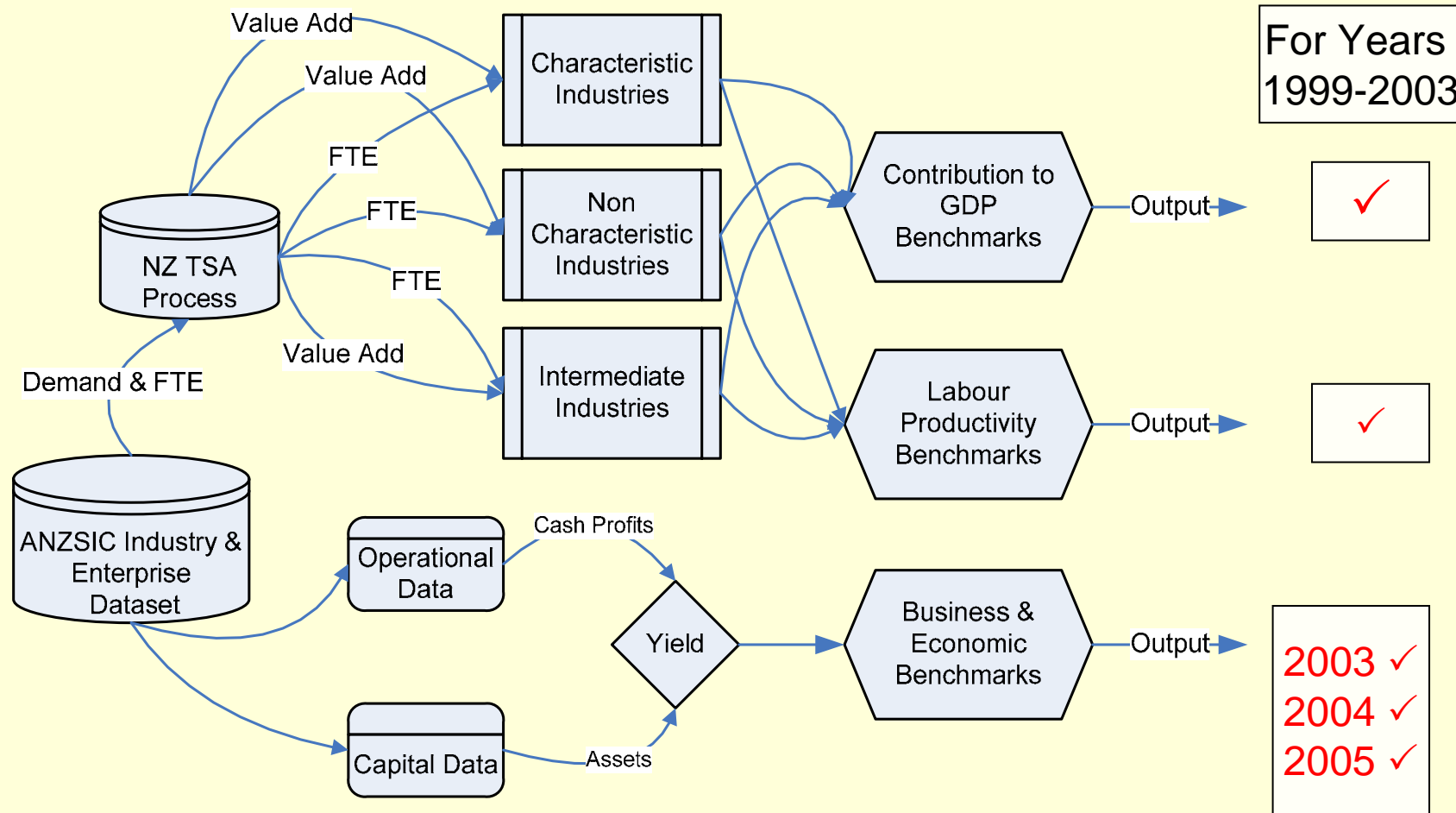
## Weaknesses

- Cell formula consistency (Audits!)
- Excel proficiency essential
- Large datasets perform poorly

# Method of Analysis

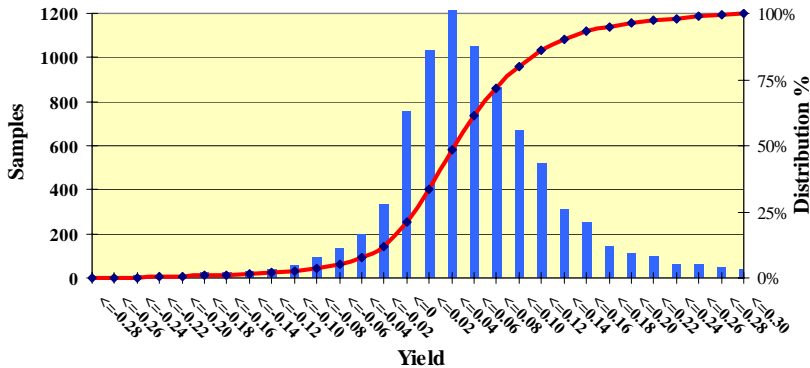
- ANZSIC Categorisation: the Tourism Characteristic and Tourism Related ANZSIC subset of NZ National Accounts. G(Retail), H(Hospitality), I(Transport), L(Leasing) and P(Recreation)
- Environmental Variables
  - From unit Enterprise P&L and Balance Sheet in SNZ AES (& National Accounts).
    - SWWP = Salaries and Wages to Working Proprietors
    - GOS = Gross Operating Surplus = (Revenue - Total Expenses + SWWP)
    - Taxation is 33% applied to all GOS>0
    - Financial Charges = Interest paid + Lease paid (where known)
    - Assets = SHF + Liabilities. Assets unavailable due to confidentiality considerations.
    - Lease Value, unknown in SNZ data, but known for sampled data. Where known, Present Value (PV) of Leases added to Assets.
- $FY = (GOS * (1 - Taxation) + Financial\ Charges) / (Assets + Lease\ PV)$
- $FCF = (GOS * (1 - Taxation) + Financial\ Charges)$
- Enterprise Level Categorisation
  - GTE – all enterprise analysis performed at Group Top level. However GTE with multiple kinds of activity units (KAU) were fully represented in each ANZSIC activity category.

# Results: A Tourism Benchmark System

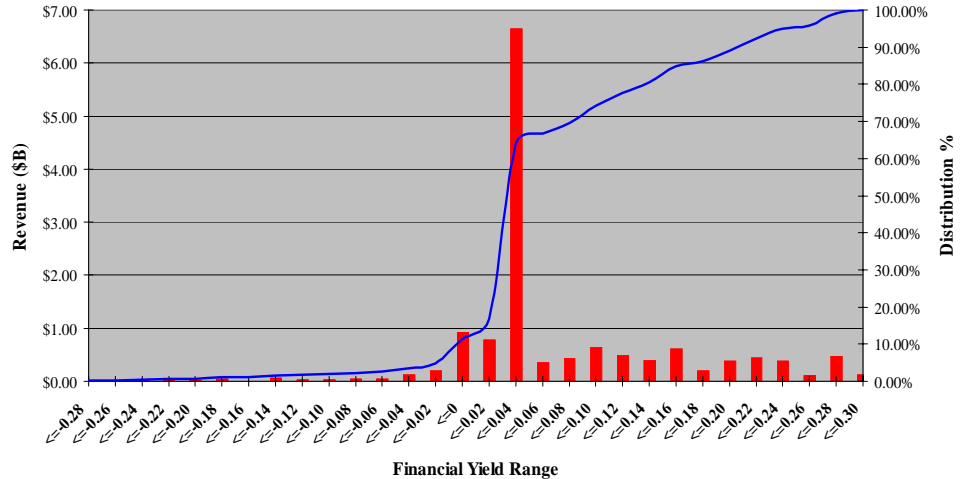


# Results ..

**All TSA Accommodation Spectrum and Distribution of Yield 1999-2003**

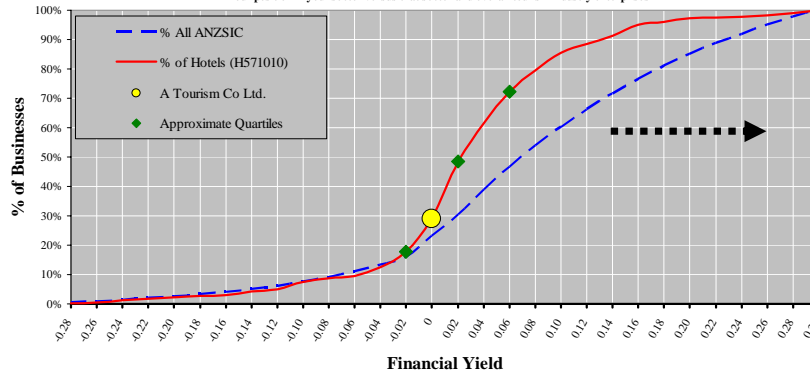


**All TSA Recreation. Revenue Distribution 1999-2003**



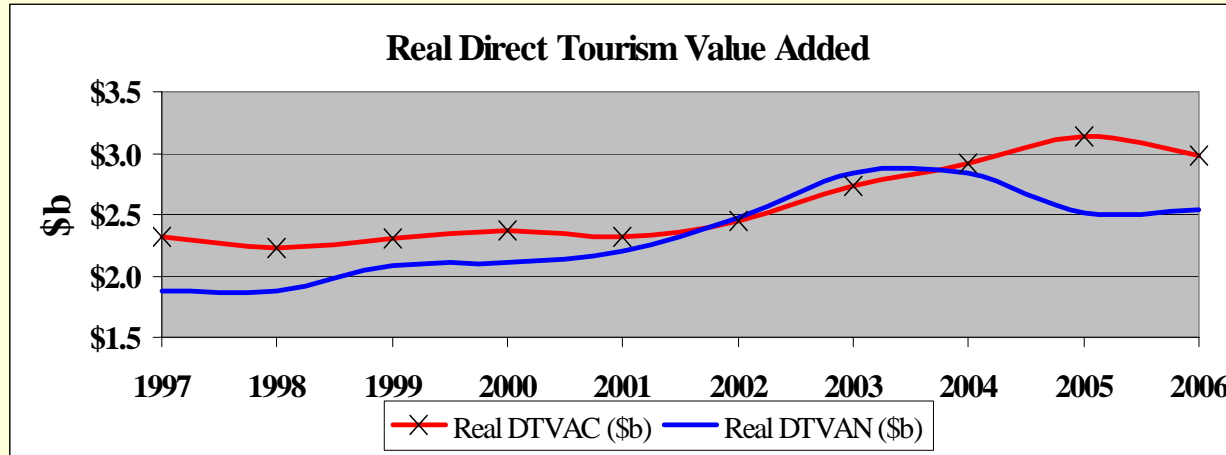
**Tourism Sector Benchmark Data for 1999-2003**

Your position in your sector versus that sector and overall tourism industry enterprises



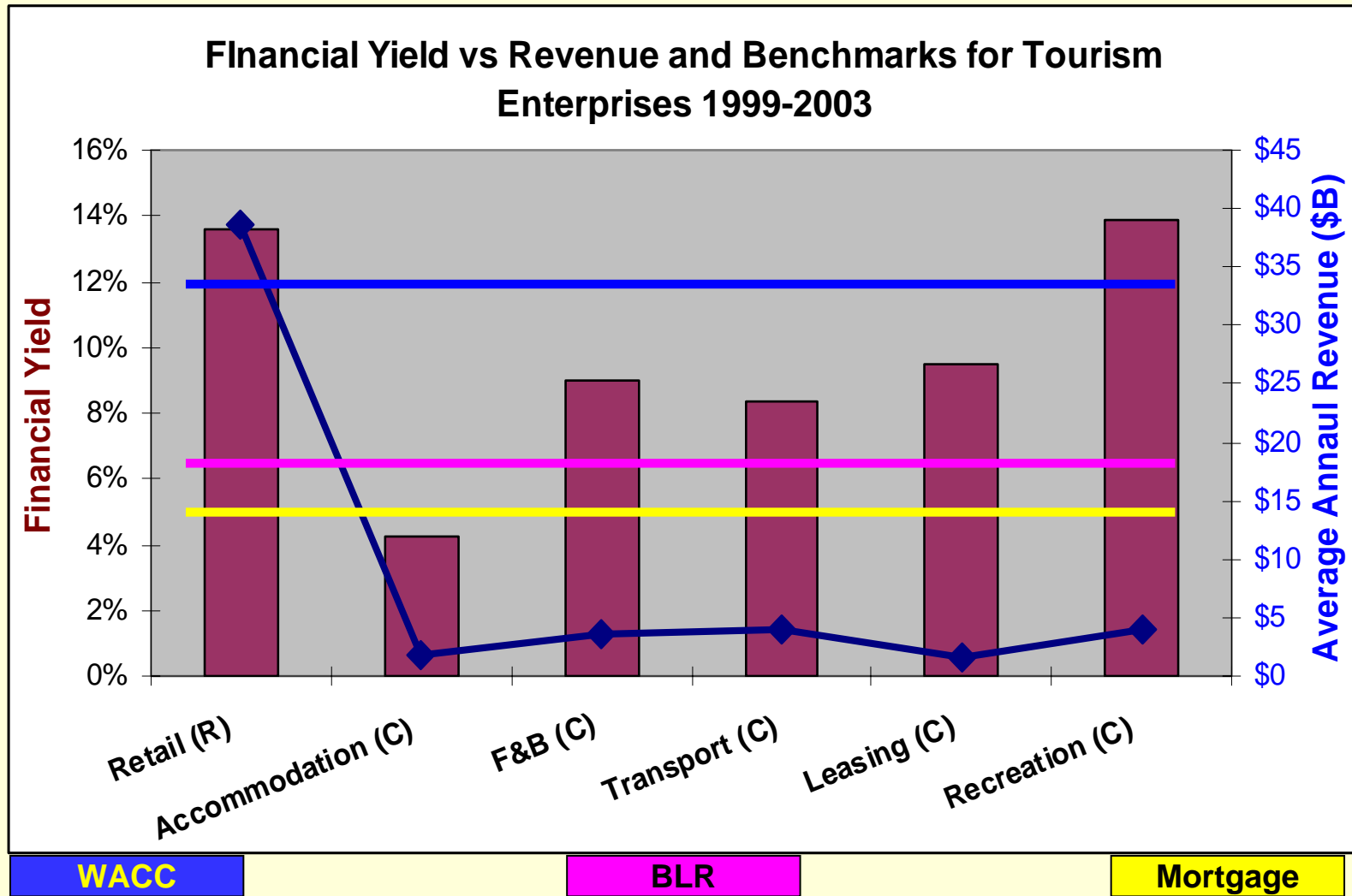
Visitor Classes Activity	HAPNZ Domestic			HAPNZ Intl		
	VA	FCF	EVA	VA	FCF	EVA
Groceries and Dairies	\$1.37	\$0.39	\$0.08	\$0.00	\$0.00	\$0.00
Retailing nec	\$2.51	\$0.64	\$0.23	\$3.18	\$0.81	\$0.29
Automotive Fuel Retailing	\$0.57	\$0.08	\$0.01	\$0.43	\$0.06	\$0.01
Caravan Parks and Camping Grounds	\$5.75	\$1.58	<b>-\$1.85</b>	\$6.74	\$1.85	<b>-\$2.17</b>
Pubs/ Taverns and Bars	\$1.08	\$0.18	\$0.03	\$0.65	\$0.11	\$0.02
Cafes and Restaurants	\$2.34	\$0.30	\$0.03	\$4.18	\$0.54	\$0.06
Short Distance Bus Transport (including Tramway)	\$0.92	\$0.18	\$0.04	\$0.00	\$0.00	\$0.00
Racing, Sports, Gambling, Lotteries and Other Recre	\$3.22	\$1.41	\$0.84	\$12.74	\$5.60	\$3.34
<b>Totals</b>	<b>\$17.76</b>	<b>\$4.76</b>	<b>-\$0.58</b>	<b>\$39.79</b>	<b>\$11.64</b>	<b>\$3.29</b>
<b>Rank</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>

# Results ...



<b>NZ Tourism Division Benchmarks 2001-2005</b>										
<b>Based on Consolidated Business Activity Unit Returns</b>										
Tourism Sectors Adjusted by TPR* 2002	Fin Yield	Cost /Rev	Fin Cost /Rev	Assets /Rev	All Sal /Rev	Emp Sal /Rev	Depn /Rev	VA /Rev	FCF /Rev	TPR*
All Retail (G5xxxx)	14.9%	0.96850	0.00593	0.25841	0.10511	0.08808	0.01134	0.15388	0.05446	6%
All Accommodation (H571xxx)	5.5%	0.94356	0.04213	1.67690	0.24407	0.22482	0.07500	0.41764	0.11782	95%
All Food & Beverage Serving Svces (H57 <sup>2</sup> 4xxxx)	9.2%	0.95802	0.01630	0.63888	0.25940	0.23798	0.03933	0.35701	0.07970	41%
All Hospitality (H57xxxxx)	6.4%	0.95005	0.03053	1.21075	0.25095	0.23073	0.05898	0.39041	0.10070	60%
All Transport (I6xxxxx)	3.0%	0.99735	0.01926	0.89120	0.19416	0.18503	0.04224	0.25831	0.03105	71%
All Recreation (P9?xxxx)	10.3%	0.90567	0.05676	1.23614	0.18563	0.17509	0.06274	0.39946	0.16162	18%
All Leasing (L774xxx)	9.3%	0.87978	0.08738	1.87585	0.10894	0.09912	0.29620	0.61273	0.21742	45%
All Leasing & Transport (I6xxxxx & L774xxx)	4.6%	0.98138	0.02851	1.02494	0.18259	0.17336	0.07674	0.30645	0.05636	66%

# Results: Tourism's Benchmark Profile



# Results: A Benchmark Tool For Tourism Enterprises



Microsoft Excel  
Worksheet

This business tool integrates most of the research into Financial Yield and many enterprise characteristics taken from the surveys. It relies on proprietor supplied data, but contains benchmark and diagnostic elements to encourage performance improvement.

# Results: Value I/O Matrix Tool

Visitor Classes Activity	HAPNZ Domestic			HAPNZ Intl		
	VA	FCF	EVA	VA	FCF	EVA
Groceries and Dairies	\$1.37	\$0.39	\$0.08	\$0.00	\$0.00	\$0.00
Retailing nec	\$2.51	\$0.64	\$0.23	\$3.18	\$0.81	\$0.29
Automotive Fuel Retailing	\$0.57	\$0.08	\$0.01	\$0.43	\$0.06	\$0.01
Caravan Parks and Camping Grounds	\$5.75	\$1.58	-\$1.85	\$6.74	\$1.85	-\$2.17
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Racing, Sports, Gambling, Lotteries and Other Recre	\$3.22	\$1.41	\$0.84	\$12.74	\$5.60	\$3.34
	VA	FCF	EVA	VA	FCF	EVA
<b>Totals</b>	\$17.76	\$4.76	-\$0.58	\$39.79	\$11.64	\$3.29
<b>Rank</b>	2	2	2	1	1	1

- Transforms visitor expenditure details in any of 67 separate activities into value-based metrics.
- Ranks visitor classes by contribution to value.
- Selectable Cost of Capital parameters for Economic Value Added (economic sustainability) estimation

# Formal Outputs

(see [www.moriarty.biz](http://www.moriarty.biz), [www.lincoln.ac.nz](http://www.lincoln.ac.nz) )



## • Reports:

1. Performance Benchmarks for New Zealand Accommodation Enterprises Based on Financial Yield
2. (3) Division Benchmarks for NZ Tourism Industries 1999-2003; 2000-2004; 2001-2005
3. Enterprise Benchmarks for NZ Tourism Industries 1999-2003
4. Analysing New Zealand's Tourism Satellite Accounts for Measures of Sector Performance and Business Benchmarks.
5. Financial Yield of Rotorua and Christchurch SMEs incorporated Datalab Findings
6. Performance Benchmarks for New Zealand Tourism Characteristic Enterprises Based on Financial Yield

## • Conferences & Seminars:

1. Tourism Yield: Analysing TSAs for measures of sector performance and business benchmarks, CAUTHE.
2. Tourism: Lucrative or Insouciant? Insight into the Financial Yield of Tourism Enterprises, VUW
3. DEA Efficiency and Capacity Utilisation of Tourism Characteristic Industries – VUW
4. Holiday Park Visitor Value, HAPNZ, Hamilton, August 2007

## • Papers Prepared

1. Sustainability Benchmarking: NZ Tourism Enterprise Performance 1999-2003.

## • Systems and Tools

1. TSA and AES Benchmarking Framework
2. Value I/O matrix for Tourism Expenditure (1999-2003) & (2001-2005)
3. Benchmark Calculator for Tourism Enterprises

# Outputs: Broad Conclusions

- Tourism characteristic enterprises generally generated higher levels of free cash per revenue dollar than related industries (suggesting price “peaking”), but
- Tourism characteristic enterprises generally had lower FY than tourism related industries (suggesting inefficient assets).
- Conclusion: the issue is economic/structural rather than financial/transactional for characteristic enterprises.

# Learning

- SNZ AES Data. Further disaggregation of enterprise cost structures recommended. Leases, energy, etc, not available.
- Datalab Tools. SAS is the SNZ preferred tool. Supercross and Excel were preferred and used very effectively.
- Data Integrity. The dataset supplied contained non-AES records! The approach used reduced the materiality of this data to zero.

# Feedback to SNZ

- **Datalab - Product Managed?**
  - Datalab is a product, not simply an access mechanism.
  - Formal Product Management principles would improve Datalab. E.g.
    - SNZ Divisions have ‘requirements’ inconsistent with mathematical confidentiality.
    - Dataset integrity: Datasets should be audited prior to delivery.
    - Issues with getting consistent advice on data interpretation and usage.
    - Modern tools should be encouraged to improve access/outcomes efficiency.
- **Wellington Facilities - very customer-focussed. ✓**
  - Responsive & proactive. Correct balance between SNZ requirements and customer requirements.
  - Output checking was generally done as promised.
  - Facilitated timely access to technical support.

# Where Now?

- This project is at an end. It has achieved the objective of establishing tourism enterprise FY and benchmarks for performance improvement.
- Methodology is well founded in theory, but finer data elements would be needed to achieve higher levels of accuracy.
- Outputs have been disseminated via reports, websites, seminars, etc, **BUT ongoing action is in the hands of proprietors**. The tools and data to embrace benchmarking as an element of business improvement are now available.

# Acknowledgements

The assistance of SNZ Staff in Wellington and Christchurch is acknowledged along with the collegiality and support of my co-researchers from Lincoln University. Professor David Simmons of Lincoln University led the research team and his leadership is also acknowledged.

This project was sponsored and funded by TIANZ and a number of its corporate members in partnership with The Ministry of Tourism (TMT). The support of both TIANZ and TMT throughout this project is gratefully acknowledged.

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J&H Moriarty Limited

[www.moriarty.biz](http://www.moriarty.biz)