

Alternative accounts concepts

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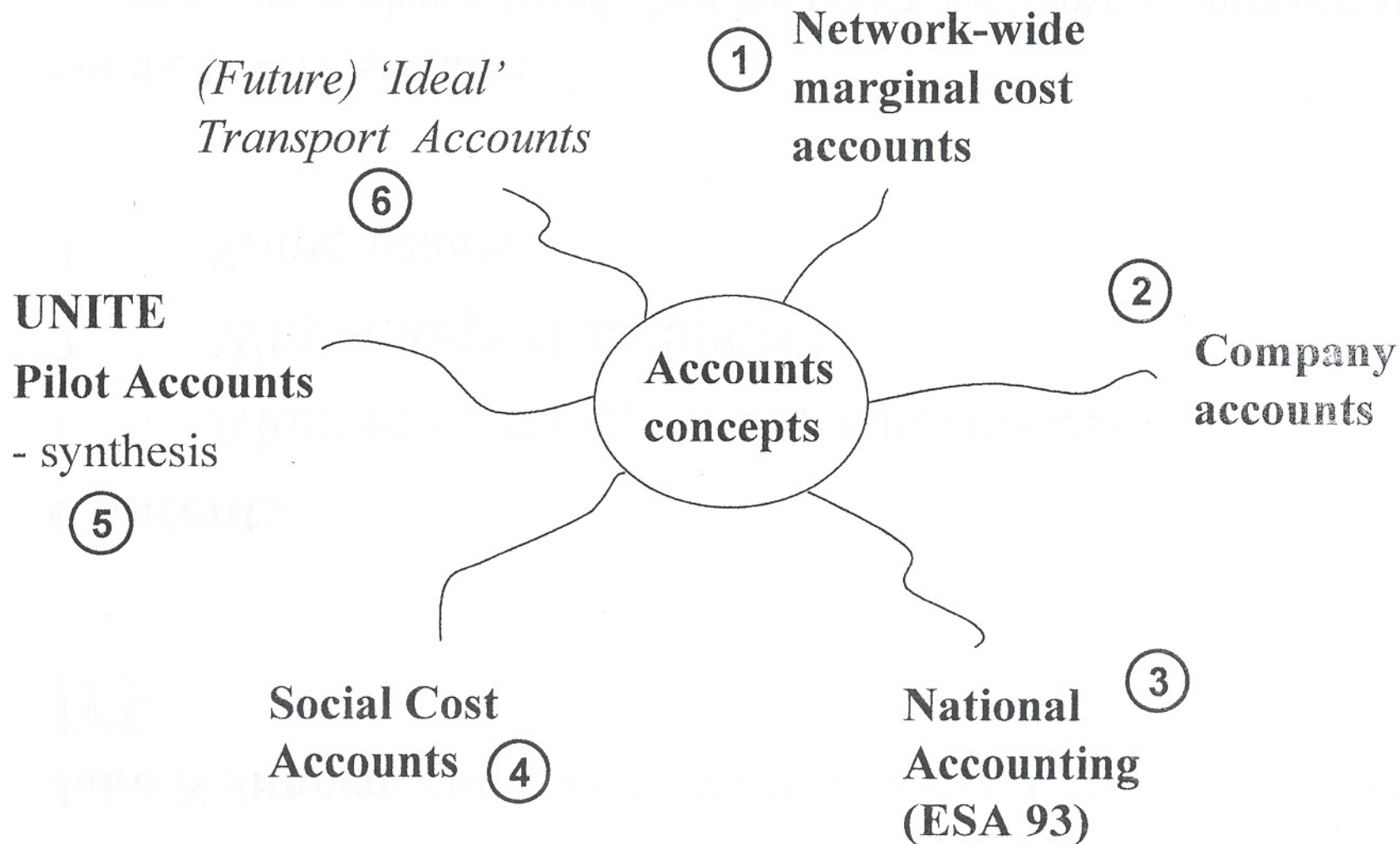
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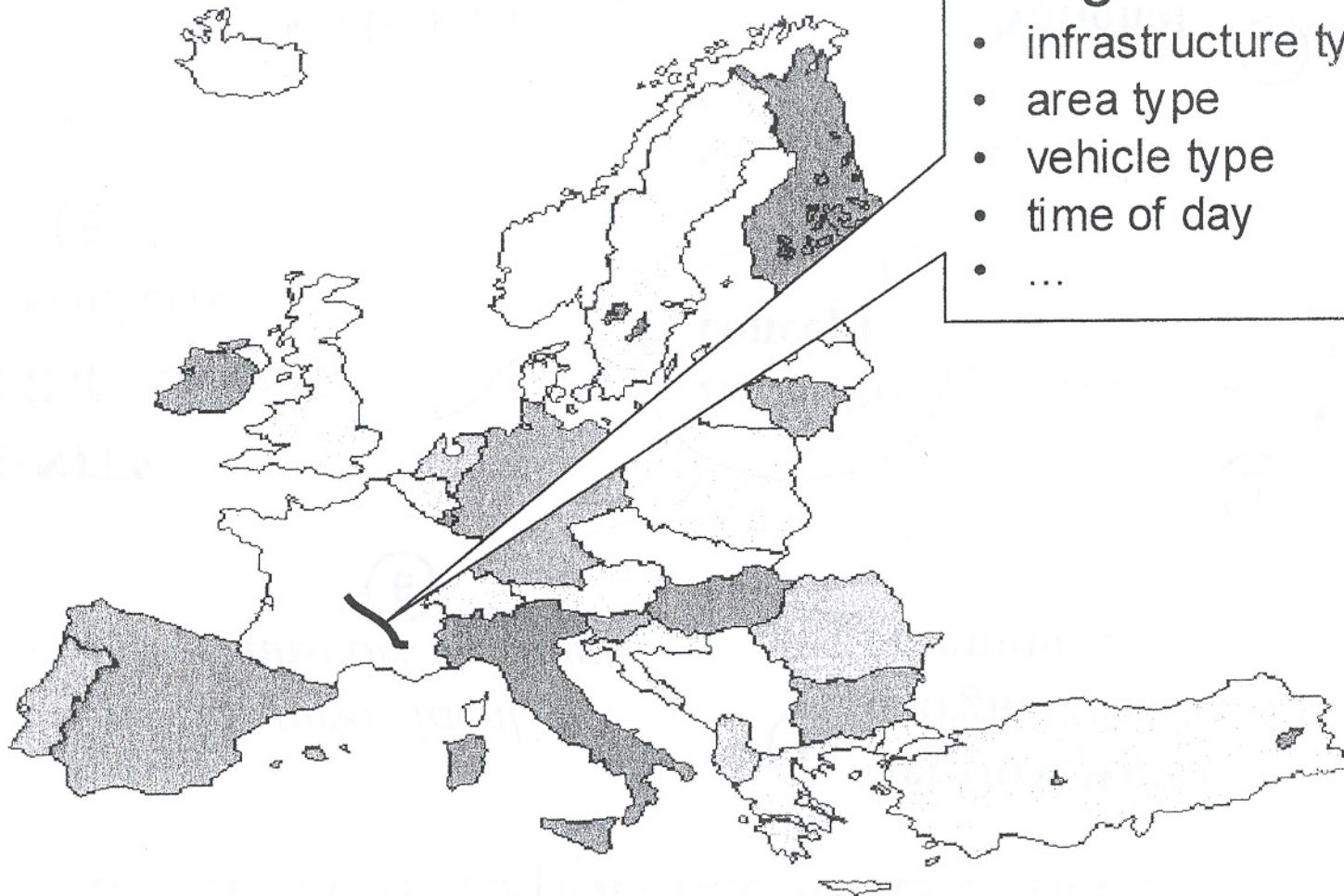
For the UNITE seminar:

“Towards an evidence-based charging policy for transport infrastructure”,
ENPC, Paris, 17 September 2001

Alternative transport accounts concepts



① Network-wide marginal cost accounts



Marginal Social Cost

- infrastructure type
- area type
- vehicle type
- time of day
- ...

① Network-wide marginal cost accounts

Highly relevant to MSC-based pricing policy:

$$P_{ijkm\dots} = f(\text{MSC}_{ijkm\dots})$$

where i,j,k,m are characteristics of the user, the trip, the vehicle, the infrastructure, etc.

Challenging in terms of:

- data
- disaggregation by i,j,k,m - varying marginal conditions

Table 7.11: Marginal Cost and Revenue Analysis – by Area type & Road type (car, pence/ vkm, low cost estimates)

Categories	Costs							Revenues			Difference Costs - Revenues	
	Infrastructure operating cost & depreciation	Cong- estion	External accident costs	Air pollution	Noise	Climate change	Total	Fuel duty	Value added tax on fuel duty	Total		
Central London												
Motorway	0.01	53.75	0.01	0.57	0.04	0.11	54.5	3.86	0.68	4.5	49.9	
Trunk & Principal	0.04	71.09	1.68	0.77	0.03	0.16	73.8	3.86	0.68	4.5	69.2	
Other	0.08	187.79	1.68	0.87	0.04	0.19	190.6	3.86	0.68	4.5	186.1	
Inner London												
Motorway	0.01	20.10	0.01	0.42	0.03	0.11	20.7	3.86	0.68	4.5	16.1	
Trunk & Principal	0.04	54.13	1.68	0.61	0.04	0.16	56.6	3.86	0.68	4.5	52.1	
Other	0.08	94.48	1.68	0.66	0.03	0.17	97.1	3.86	0.68	4.5	92.6	
Outer London												
Motorway	0.01	31.09	0.01	0.31	0.02	0.10	31.5	3.86	0.68	4.5	27.0	
Trunk & Principal	0.04	28.03	1.68	0.40	0.02	0.14	30.3	3.86	0.68	4.5	25.8	
Other	0.08	39.66	1.68	0.45	0.02	0.16	42.0	3.86	0.68	4.5	37.5	
Inner Conurbation												
Motorway	0.01	53.90	0.01	0.47	0.02	0.11	54.5	3.86	0.68	4.5	50.0	
Trunk & Principal	0.04	33.97	1.68	0.55	0.02	0.14	36.4	3.86	0.68	4.5	31.9	
Other	0.08	60.25	1.68	0.66	0.02	0.17	62.9	3.86	0.68	4.5	58.3	
Outer Conurbation												
Motorway	0.01	35.23	0.01	0.25	0.02	0.10	35.6	3.86	0.68	4.5	-31.1	
Trunk & Principal	0.04	12.28	1.68	0.30	0.02	0.12	14.4	3.86	0.68	4.5	9.9	
Other	0.08	0.00	1.68	0.32	0.02	0.13	2.2	3.86	0.68	4.5	-2.3	
Urban >25 km2												
Trunk & Principal	0.04	10.13	1.68	0.25	0.02	0.12	12.2	3.86	0.68	4.5	7.7	
Other	0.08	0.72	1.68	0.26	0.02	0.13	2.9	3.86	0.68	4.5	-1.6	
Urban 15-25 km2												
Trunk & Principal	0.04	7.01	1.68	0.25	0.02	0.12	9.1	3.86	0.68	4.5	4.6	
Other	0.08	0.00	1.68	0.24	0.02	0.12	2.1	3.86	0.68	4.5	-2.4	
Urban 10-15 km2												
Trunk & Principal	0.04	0.00	1.68	0.17	0.02	0.11	2.0	3.86	0.68	4.5	-2.5	
Other	0.08	0.00	1.68	0.19	0.02	0.12	2.1	3.86	0.68	4.5	-2.4	
Urban 5-10 km2												
Trunk & Principal	0.04	2.94	1.68	0.15	0.02	0.11	4.9	3.86	0.68	4.5	0.4	
Other	0.08	0.00	1.68	0.16	0.02	0.12	2.1	3.86	0.68	4.5	-2.5	
Urban 0.01-5 km2												
Trunk & Principal	0.04	1.37	1.68	0.13	0.01	0.11	3.3	3.86	0.68	4.5	-1.2	
Other	0.08	0.00	1.68	0.14	0.01	0.12	2.0	3.86	0.68	4.5	-2.5	
Rural												
Motorway	0.01	4.01	0.01	0.11	0.00	0.13	4.3	3.86	0.68	4.5	-0.3	
Trunk & Principal	0.04	8.48	0.30	0.10	0.00	0.11	9.0	3.86	0.68	4.5	4.5	
Other	0.08	1.28	0.30	0.10	0.01	0.10	1.9	3.86	0.68	4.5	-2.7	

Marginal Cost and Revenue Analysis – by Area type

Categories	Costs				
	Infrastructure operating cost & depreciation	Congestion	External accident costs	Air pollution	Noise
Central London					
Motorway	0.01	53.75	0.01	0.57	0.0
Trunk & Principal	0.04	71.09	1.68	0.77	0.0
Other	0.08	187.79	1.68	0.87	0.0
Inner London					
Motorway	0.01	20.10	0.01	0.42	0.0
Trunk & Principal	0.04	54.13	1.68	0.61	0.0
Other	0.08	94.48	1.68	0.66	0.0
Outer London					
Motorway	0.01	31.09	0.01	0.31	0.0
Trunk & Principal	0.04	28.03	1.68	0.40	0.0
Other	0.08	39.66	1.68	0.45	0.0
Inner Conurbation					
Motorway	0.01	53.90	0.01	0.47	0.0
Trunk & Principal	0.04	33.97	1.68	0.55	0.0

② Company accounts

Annual Report and Accounts:

- Profit and loss
- Balance sheet
- Cash flow statement

Relevant organisations:

- transport infrastructure and service providers (Alitalia; FinnRa; Deutsche Bahn; Stena...)

Characteristics:

- robust, transparent data on operators total costs, revenues and assets;
- omits final users' costs and environmental/accident externalities;
- does not identify fixed, variable or marginal costs.

Notes to the accounts

1 Segmental information

(a) Revenue, operating profit and net assets	Revenue		Operating profit - pre exceptional	
	2001 £m	2000 £m	2001 £m	2000 £m
Airports				
Heathrow	759	712	345	327
Gatwick	290	293	126	113
Stansted	113	86	29	22
Total UK regulated airports	1,162	1,091	500	462
Glasgow	65	61	26	26
Edinburgh	50	43	18	15
Aberdeen	26	25	11	10
Southampton	14	12	3	2
Total UK non-regulated airports	155	141	58	53
Total international airports	64	57	8	8
Total airports	1,381	1,289	566	523

③ National Accounting Framework

- **European System of Accounts (ESA)**
- **consistent with:**
OECD/UN/World Bank/EC, 'System of National Accounts - SNA' (1993)
- **decomposition of:**
 - GVA at basic prices
 - GDP at market prices**into standard industrial classifications**
 - ↳ **extension to transport sector (in detail) - transport 'Satellite' accounts**

TRANSPORTS FERROVIAIRES (hors SNCF Ile de France)

Dépenses nationales de transport dans le mode (hors dépenses d'infra)

	1 992	1 996
Dépense courante nationale	42 273	40 27
Emplois en produits caractéristiques	35 922	33 47
Passagers		
Total	23 549	23 18
Dépense consommation finale des ménages	14 821	15 45
Dépense consommation finales des APU	1 699	1 76
Consommations intermédiaires	5 643	4 69
Compte propre		
TVA non déductible payée par les usagers	1 386	1 27
Fret		
Consommations intermédiaires des entreprises	12 373	10 29
Transferts courants des APU yc TVA déductible	6 350	6 80
Passagers	6 175	6 68
Aux entreprises	6 175	6 68
<i>dont CRT hors tarifs sociaux</i>	1 703	1 650
<i>dont TVA</i>	331	35
Fret		
A la SNCF	175	11
<i>dont CRT</i>	175	11
Solde export-import	1 654	1 89
Dépense courante intérieure	43 927	42 17
Dépense en capital	7 955	5 70
FBCF des entreprises (matériel et outillage)	7 955	5 70

④ Social Cost Accounts

Example: Road costs and charges

Item	Revenue £bn	Item	Cost (low) £bn	Cost (high) £bn
Fuel tax	17.15	Maintenance	3.46	4.06
Vehicle excise duty	4.23	Interest	6.00	9.00
		Air pollution	0.6	3.6
		Global warming	0.1	1.8
		Noise	0.9	1.7
		Water pollution	0.5	1.0
Total taxes	21.38	Total costs	11.56	21.16

Source: Newbery (1999), *Fair payment from road-users: a review of the evidence on social and environmental costs*

④ Social Cost Accounts

Item	Total Million FIM (1997)	Variable Million FIM (1997)
Road expenditure	8130	1843
Accident costs	4032	4032
Pollution costs	3625	3625
Costs (1)	15787	9500
Tax revenue (2)	20780	13476
Cost recovery (2/1)	132%	142%

Source: Metsaranta (1999), *Cost Recovery of Transport in Finland*

④ Social Cost Accounts

Table II.1: Canadian System-Wide Annual Costs of Inter-Urban Car Travel
(in cents per passenger km, 1991\$Can)

Type of cost	Users	Others	Total
Infrastructure	0.0	2.1	2.1
Environmental	0.0	0.6	0.6
Accident	3.7	0.1	3.8
Special transportation tax	1.2	-1.2	0.0
Vehicle carrier	10.9	0.0	10.9
TOTAL	15.8	1.6	17.4

Source: Royal Commission on National Passenger Transportation (1992)

Note:

- underlying assumption of full cost allocation to vehicle types and per vehicle-km

④ Social Cost Accounts

Characteristics:

- **inclusion of all (most) social costs;**
- **indicate balance of costs vs. charges;**
- **BUT:**
 - . what is pricing-relevant?
 - . arbitrary cost allocation is inconsistent with efficient pricing.

⑤ UNITE Pilot Accounts

Synthesis of information:

- **social costs of transport infrastructure use -
focus on pricing-relevant costs**
- **taxes/charges for transport infrastructure use**

⑤ UNITE Pilot Accounts

Core Information

	<i>To whom:</i>
Infrastructure costs	<i>infrastructure provider</i>
Social costs of supported services (rail and urban public transport)	<i>public sector budget</i>
Accident costs (external to transport sector)	<i>public sector, wider economy</i>
Environmental costs	<i>global population</i>
<hr/>	
Charges for transport infrastructure use	<i>users</i>
Taxes on transport infrastructure use (other than standard rate VAT)	<i>users</i>

⑥ *Future 'Ideal' Transport Accounts*

- **UNITE 'Ideal' Accounts specification**

- . **a high level of disaggregation** - reflecting factors such as income group, location, time period at the transport link/terminal level;
- . **full information on the financial and social cost structure** - including marginal, variable and fixed costs;
- . **dynamic** - includes modelling, to assess demand/supply responses to more differentiated charging systems.

- **UNITE Welfare Accounts**

- . integration of accounts and marginal costs;
- . economic theory basis;
- . Presentation by Proost in Session 3 (Tuesday)

- **Regulatory Accounts**

Why transport accounts?

Some questions that can be answered with Pilot Accounts:

- Environmental costs
 - Accident costs
- } what is the scale of the problem:
- in each country
 - for 1996, 1998, 2005
- in total, are transport users paying enough to cover the total social costs caused?
 - by mode
 - in urban/rural areas
 - by passenger/freight transport
 - ...

Why transport accounts?

Some questions that can be answered with Pilot Accounts:

- how do the structure of costs and charges relate? (earmarking)
 - for example, total 'environmental' taxes on transport vs. environmental costs;
 - 'road fund' revenue vs. road infrastructure costs;
 - road tolls vs. congestion costs

Some issues

- **role of accounts in the Common Transport Policy and Framework Directive on pricing**
- **management of information:**
 - making social subsidy of transport explicit including where environmental and accident costs go uncompensated.
- **the benefits of transport**
 - if Willingness To Pay $>$ price;
 - scale economies in other sectors.