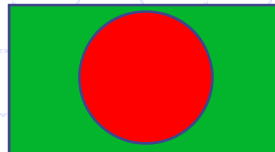


BEST PRACTICES IN RAILWAY REFORM

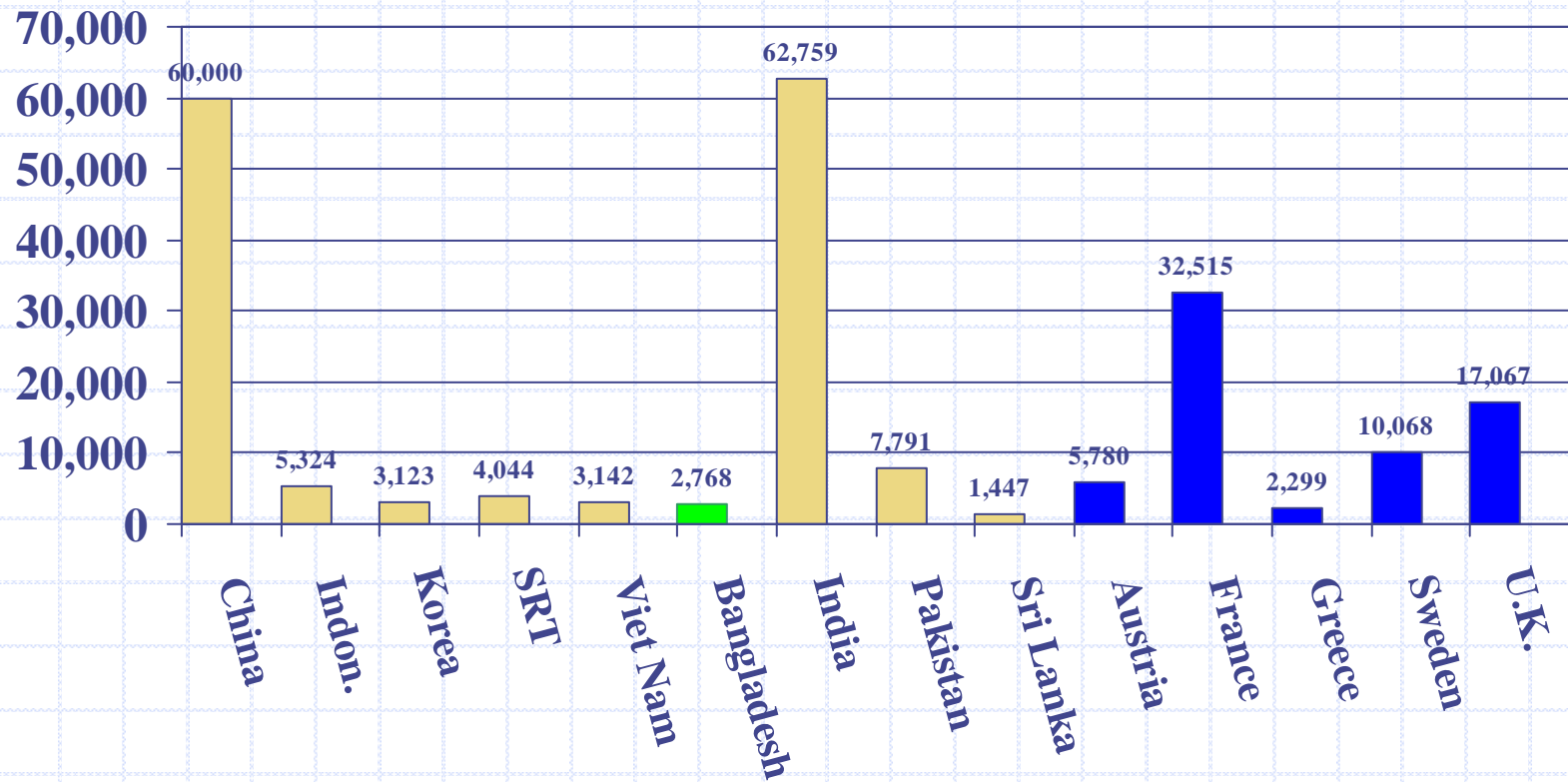
Lou Thompson
Consultant (retired Railways Adviser)
The World Bank
Dhaka, Bangladesh,
June 10, 2003



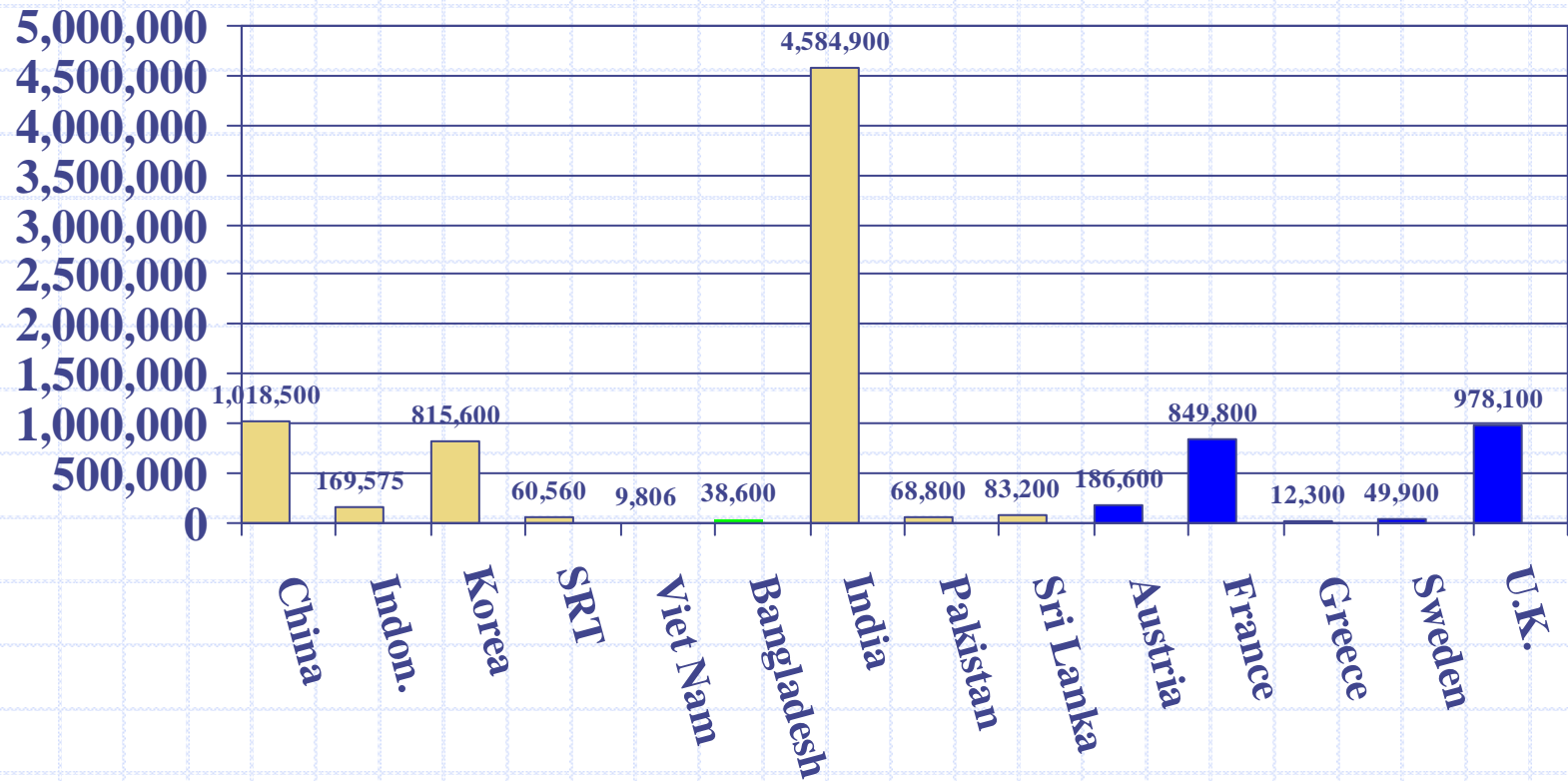
Best Practices in Railway Reform

- ◆ A short picture of Bangladesh Railways
- ◆ Restructuring issues
- ◆ Lessons

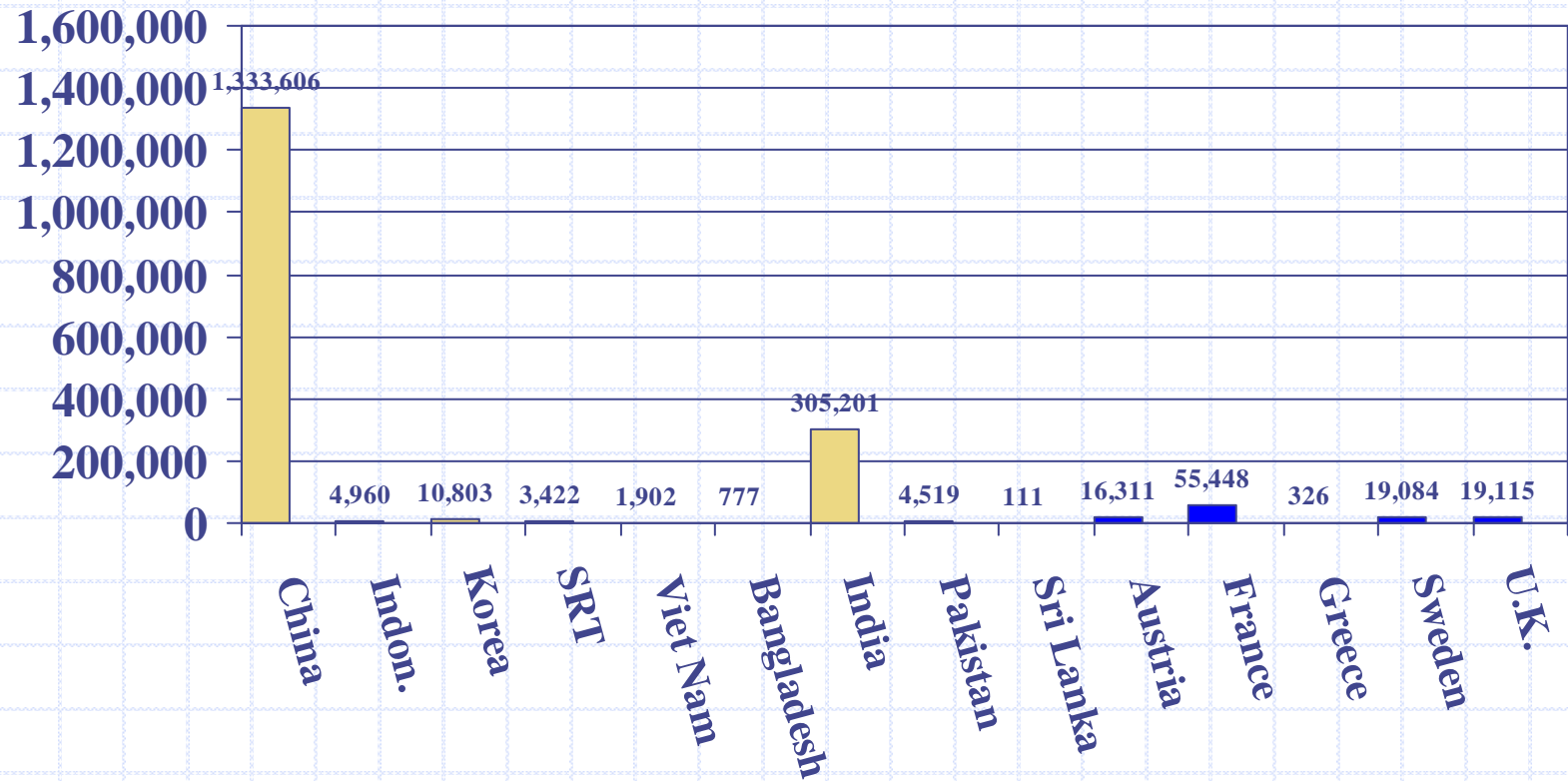
KM of Line



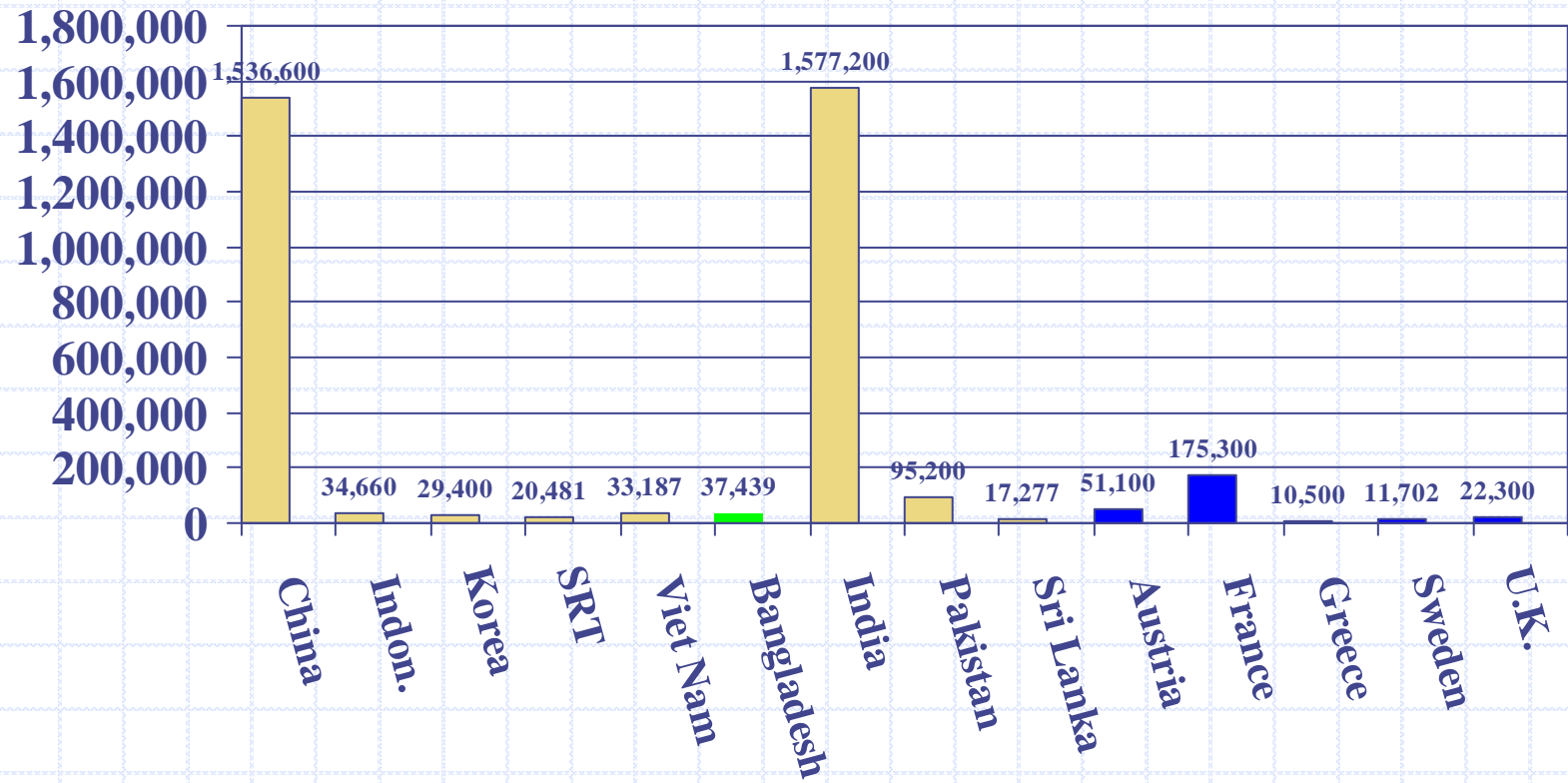
Passenger-Km



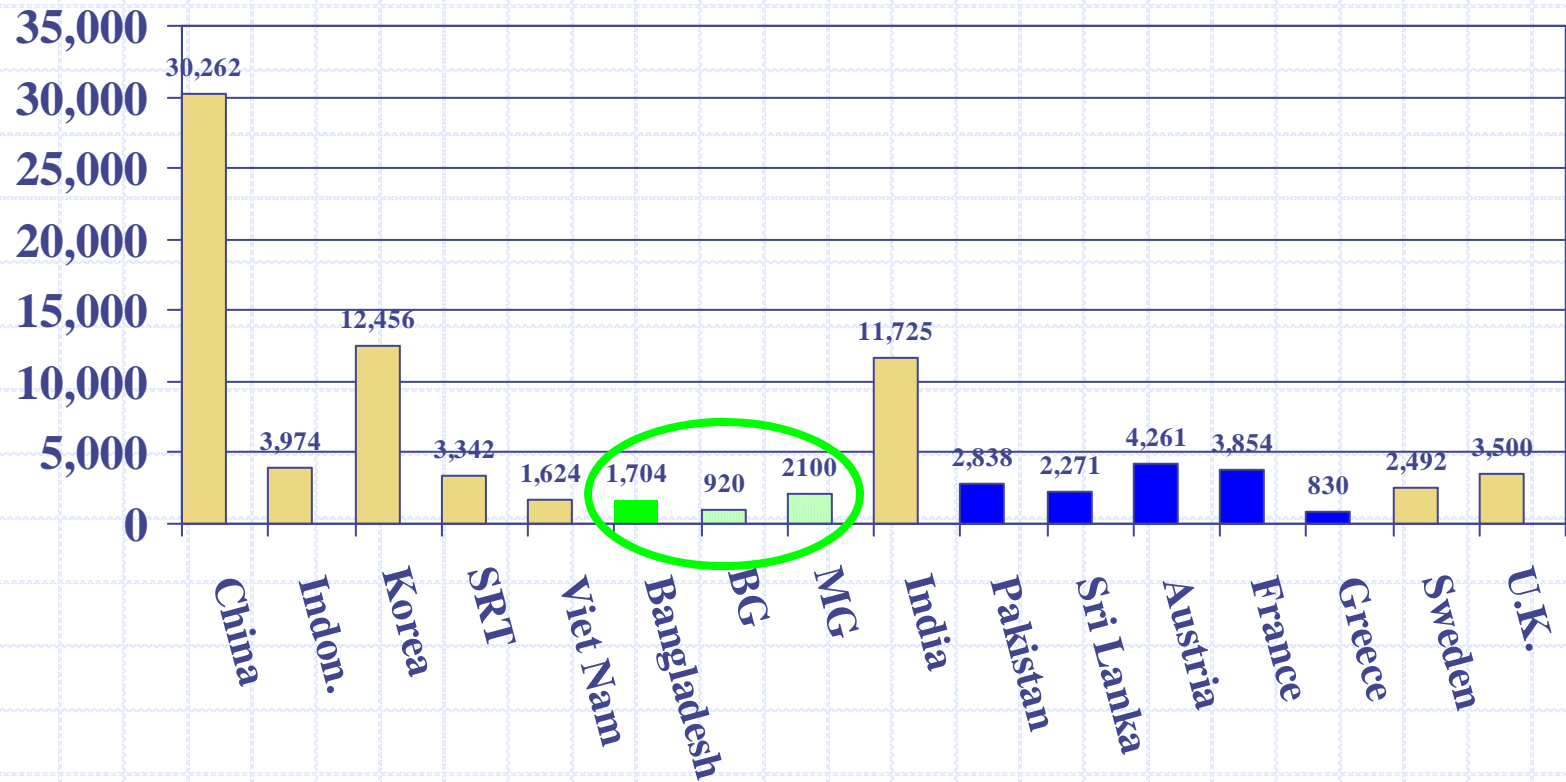
Freight Ton-Km



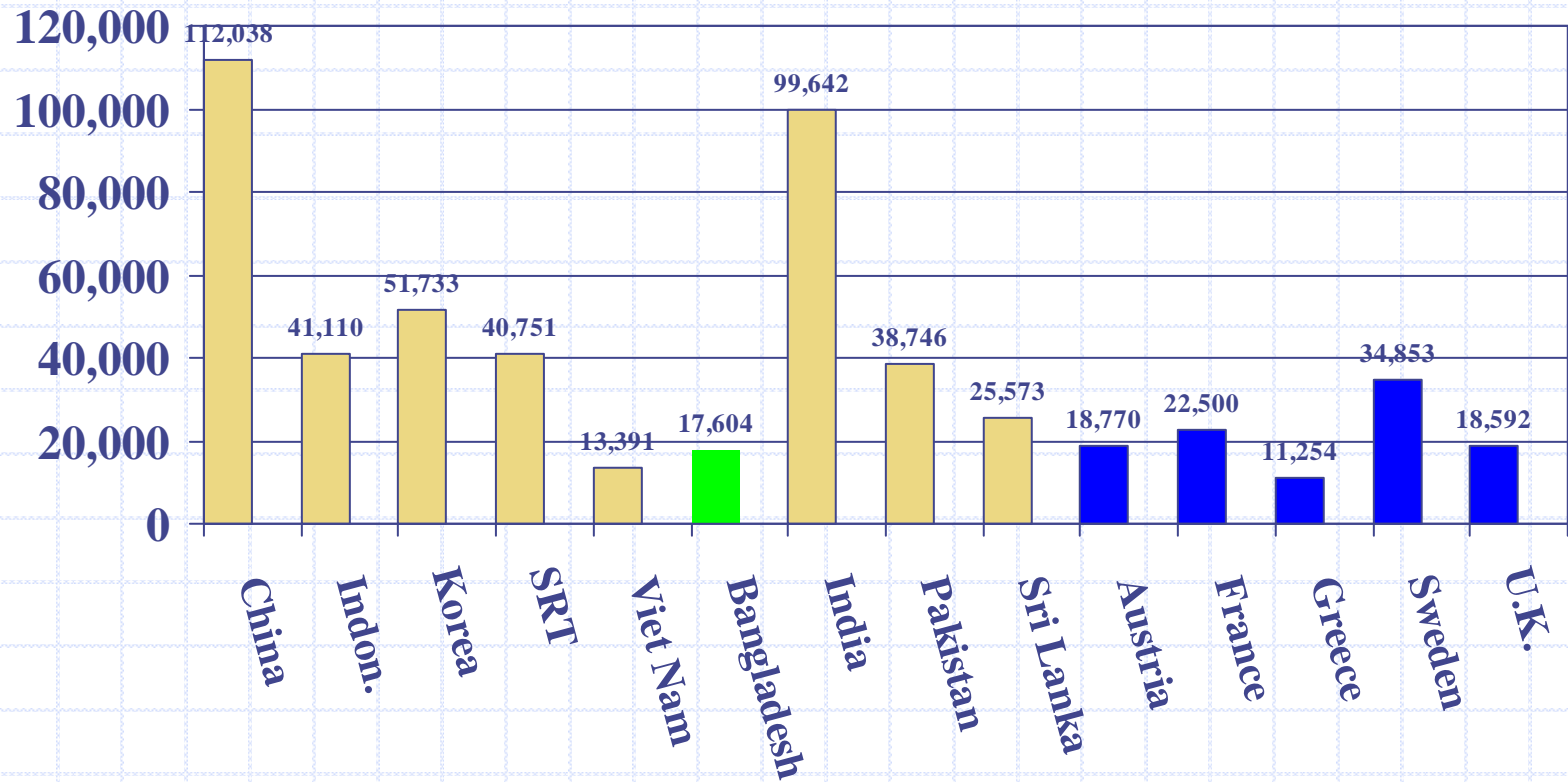
Staff



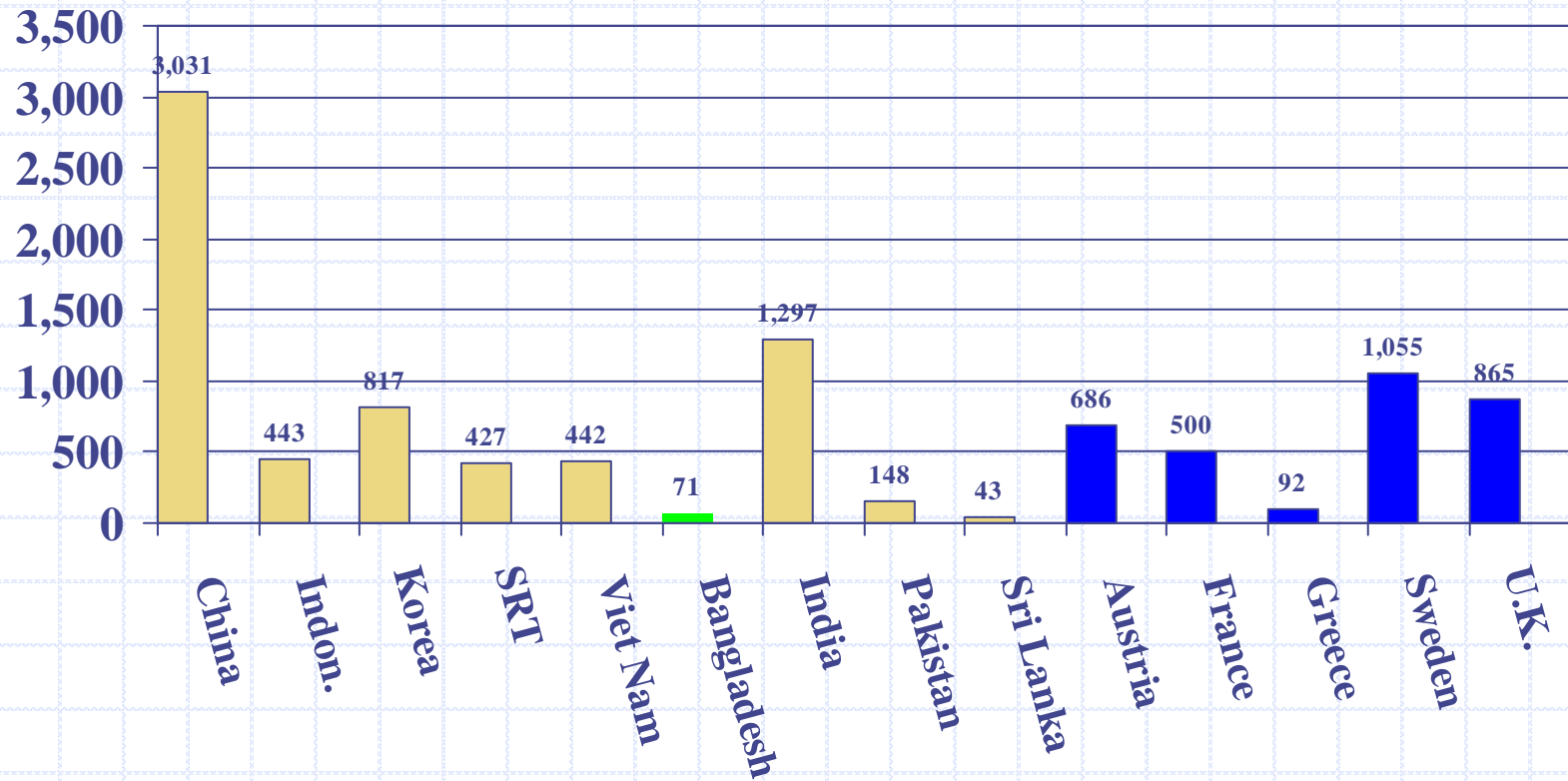
Traffic Density (TU/Km)



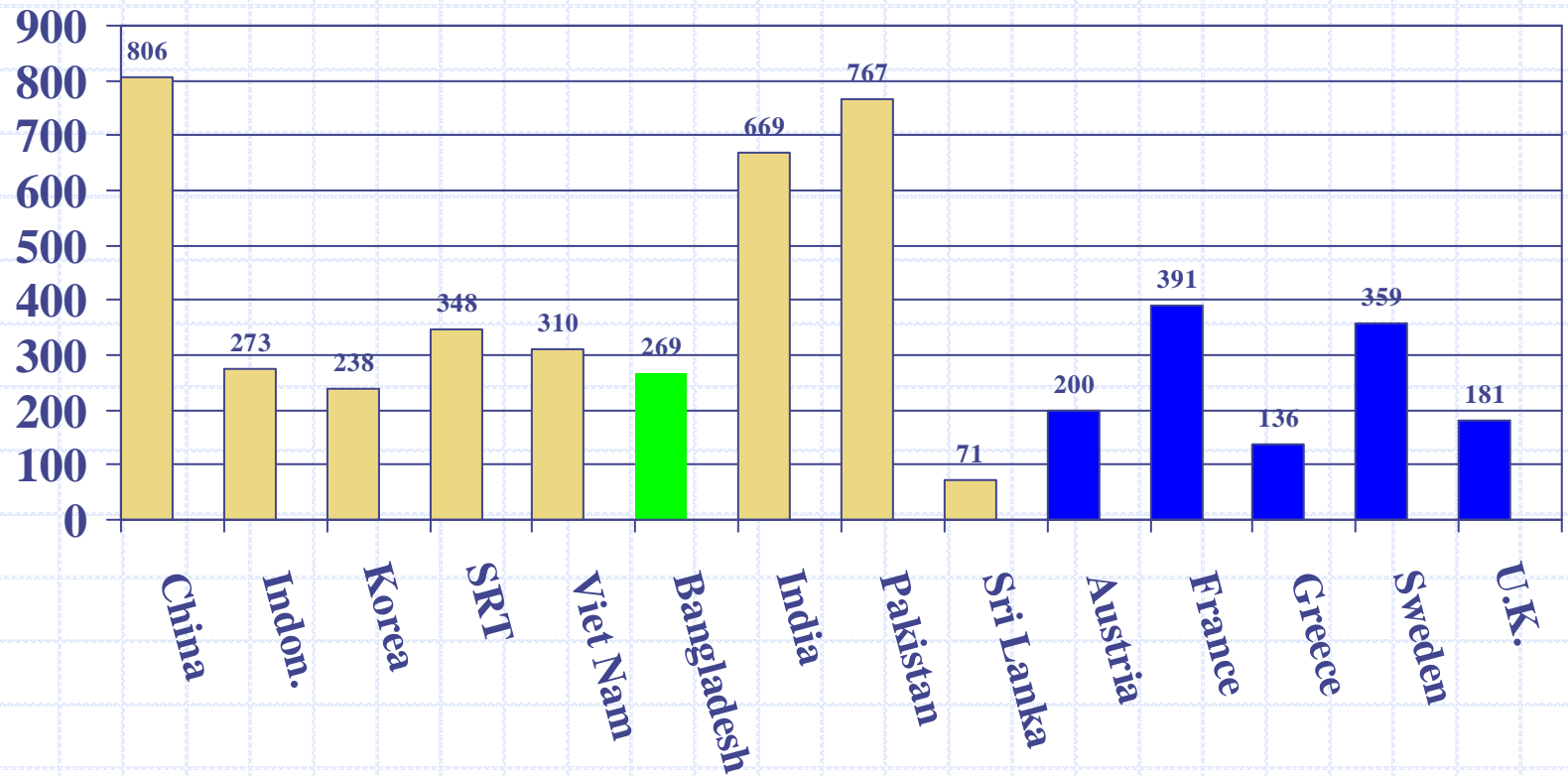
Locomotive Productivity (TU/Locomotive)



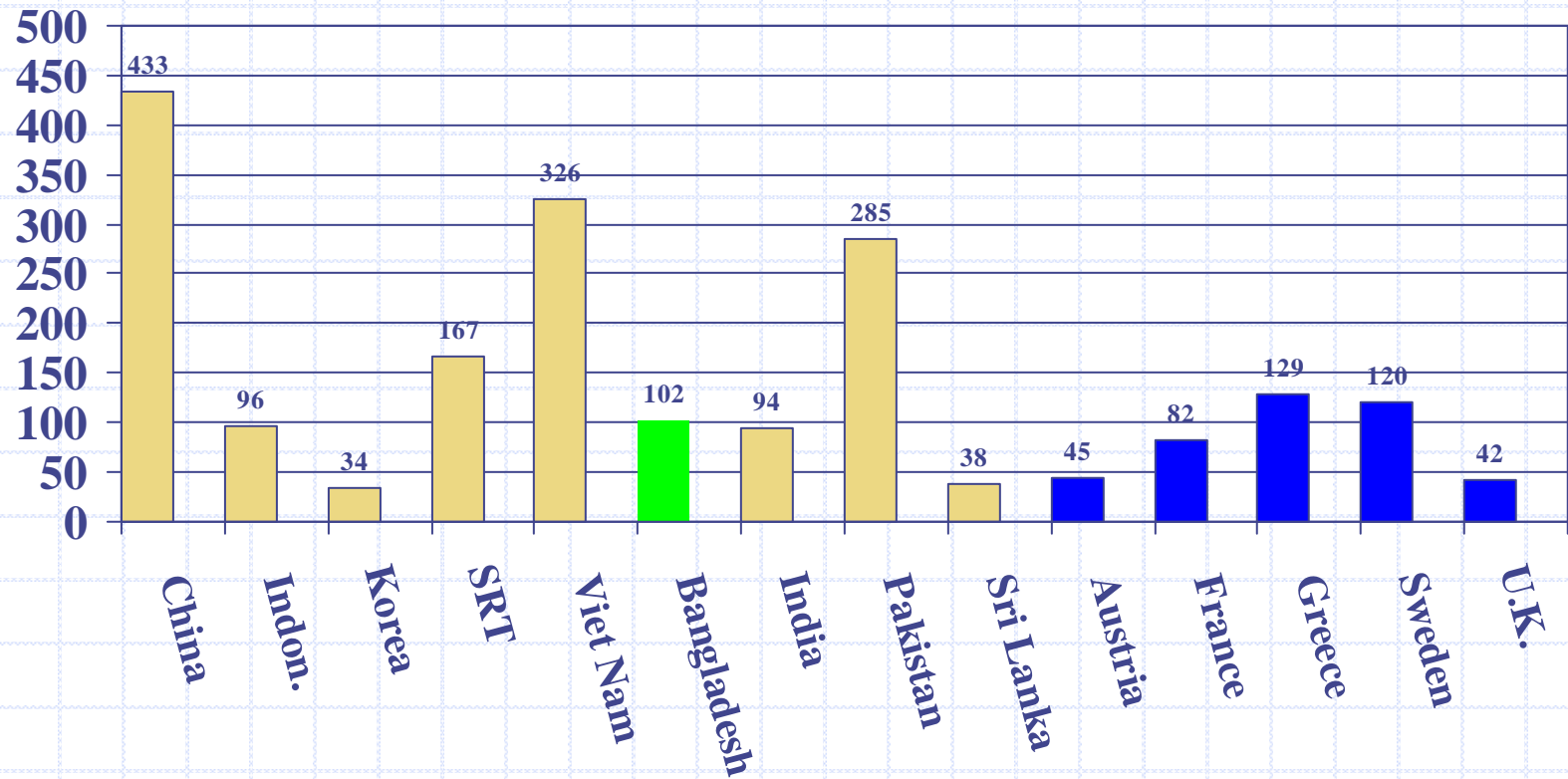
Wagon Productivity (T-Km/Wagon



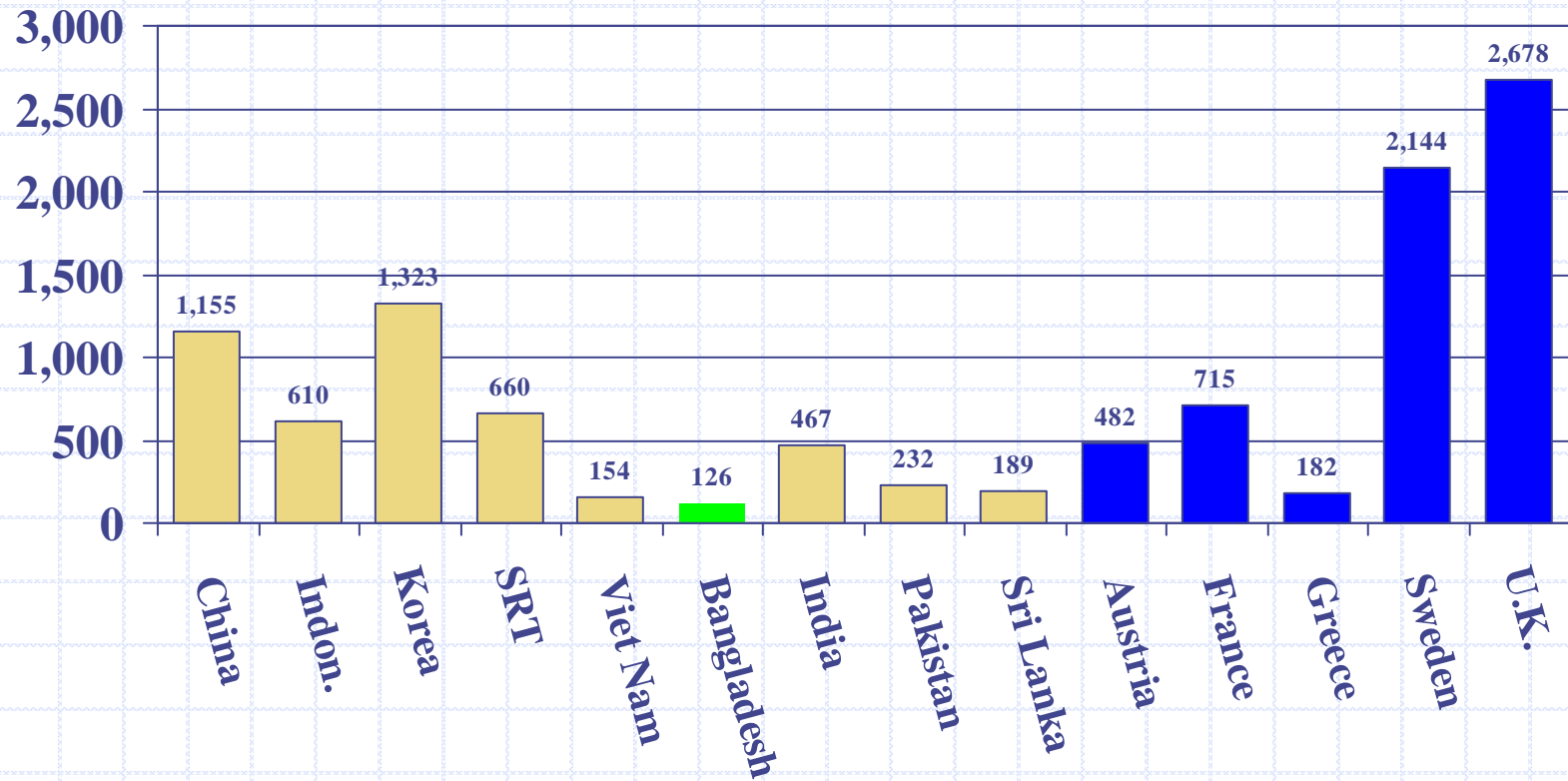
Average Freight Lead



Average Passenger Lead

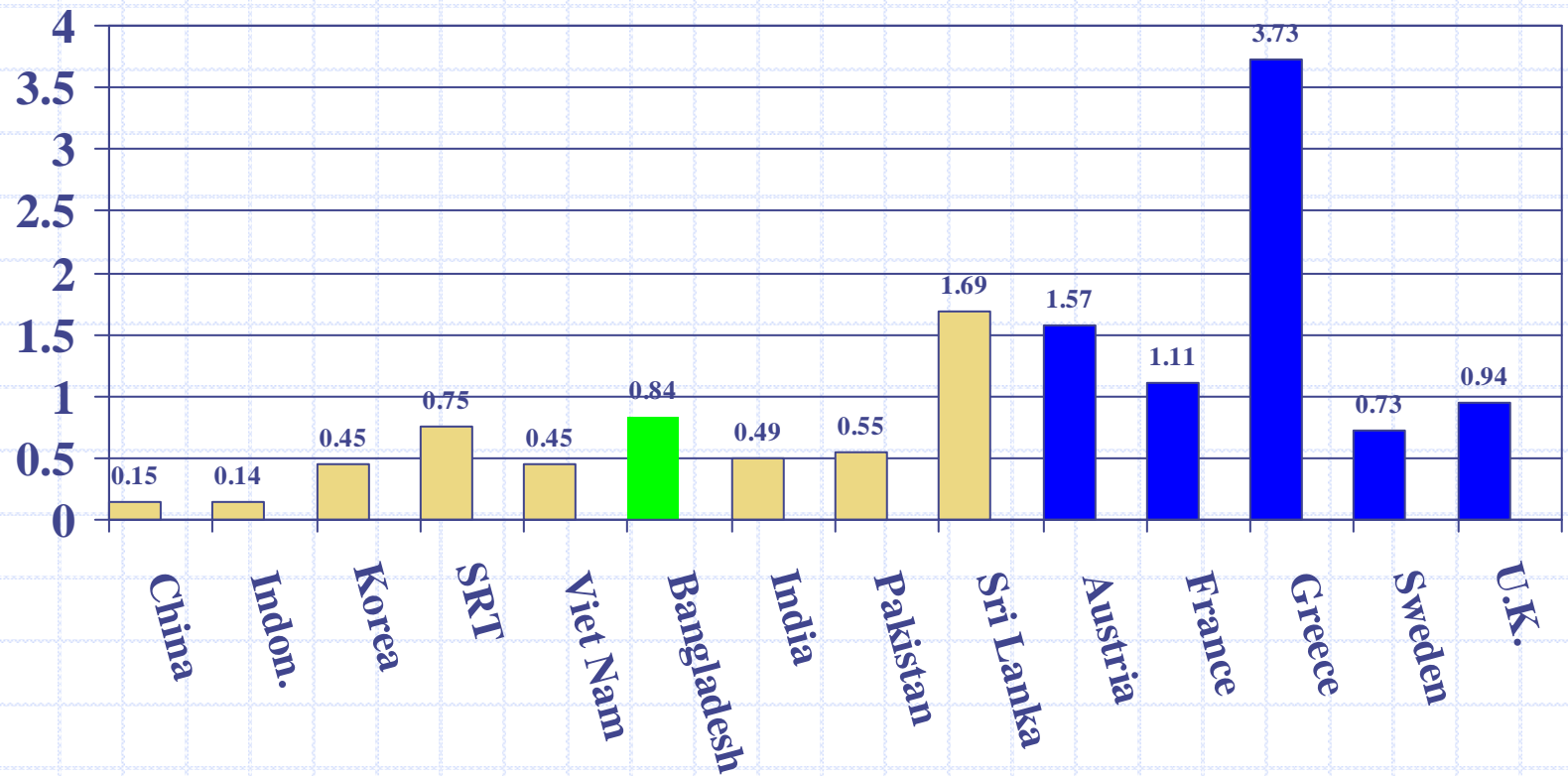


Traffic Units/Employee

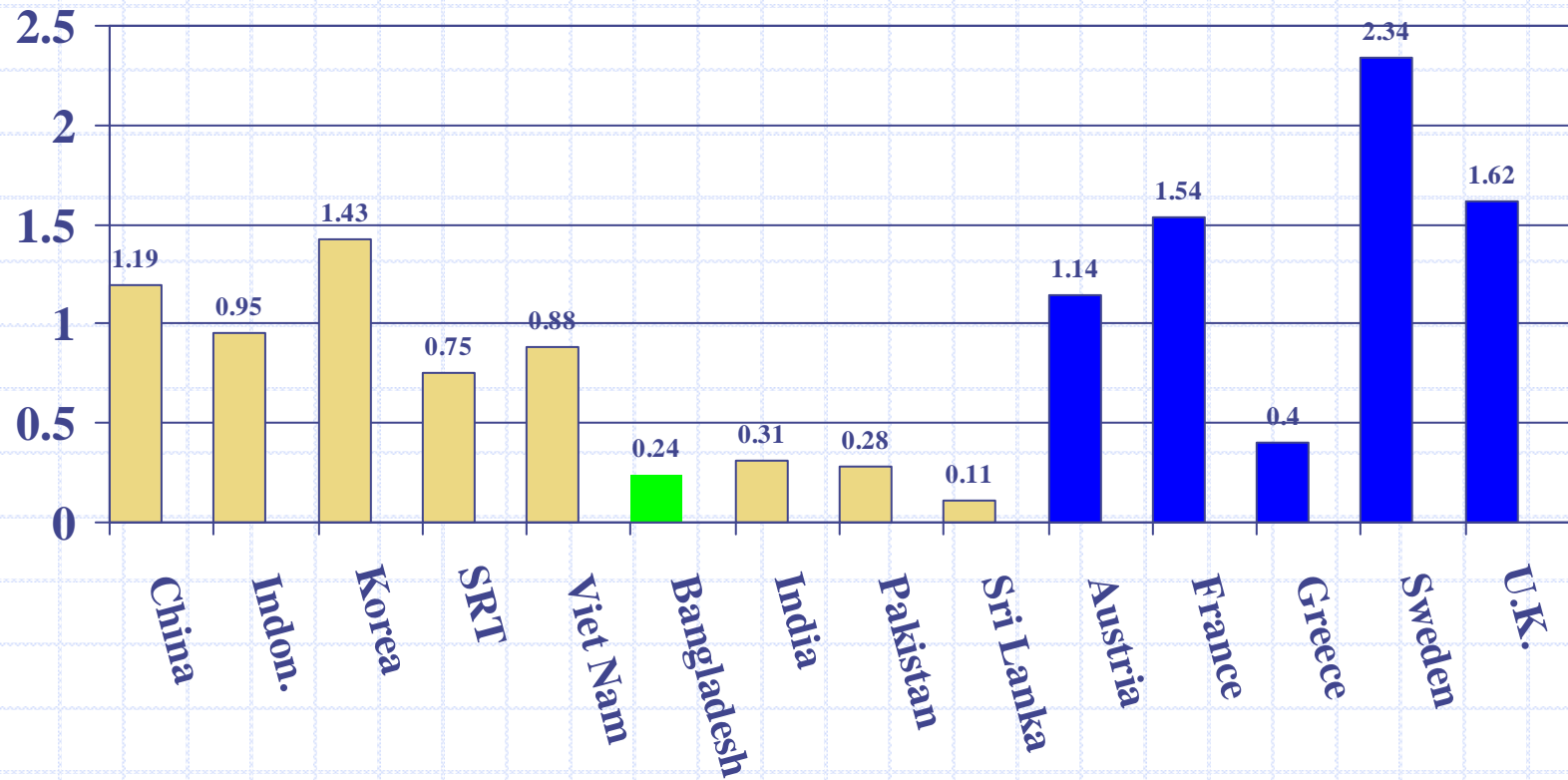


$$TU = T \cdot Km + P \cdot Km$$

Wage/Revenue Ratio

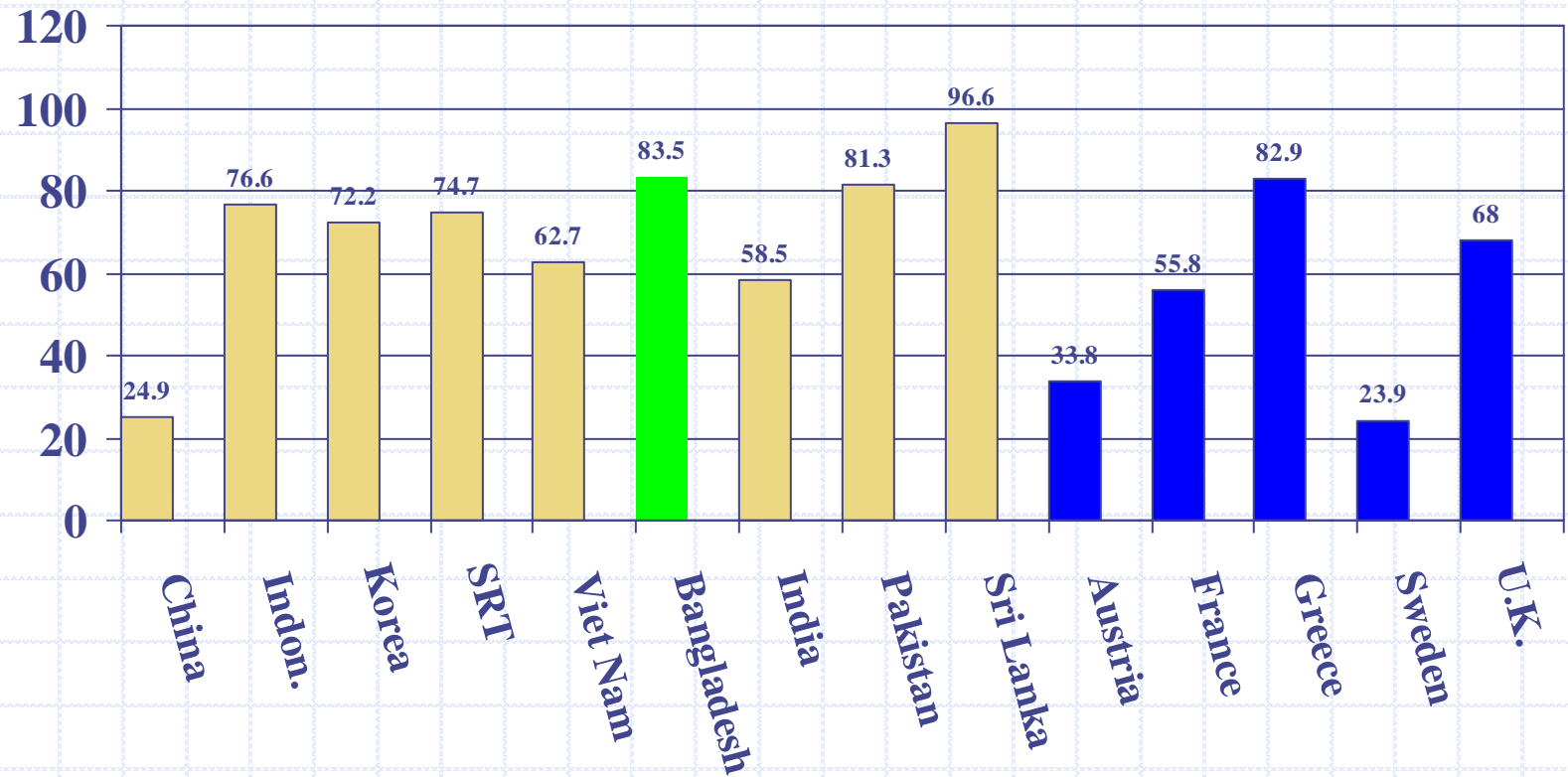


Ratio of Average Passenger Fare to Average Freight Tariff



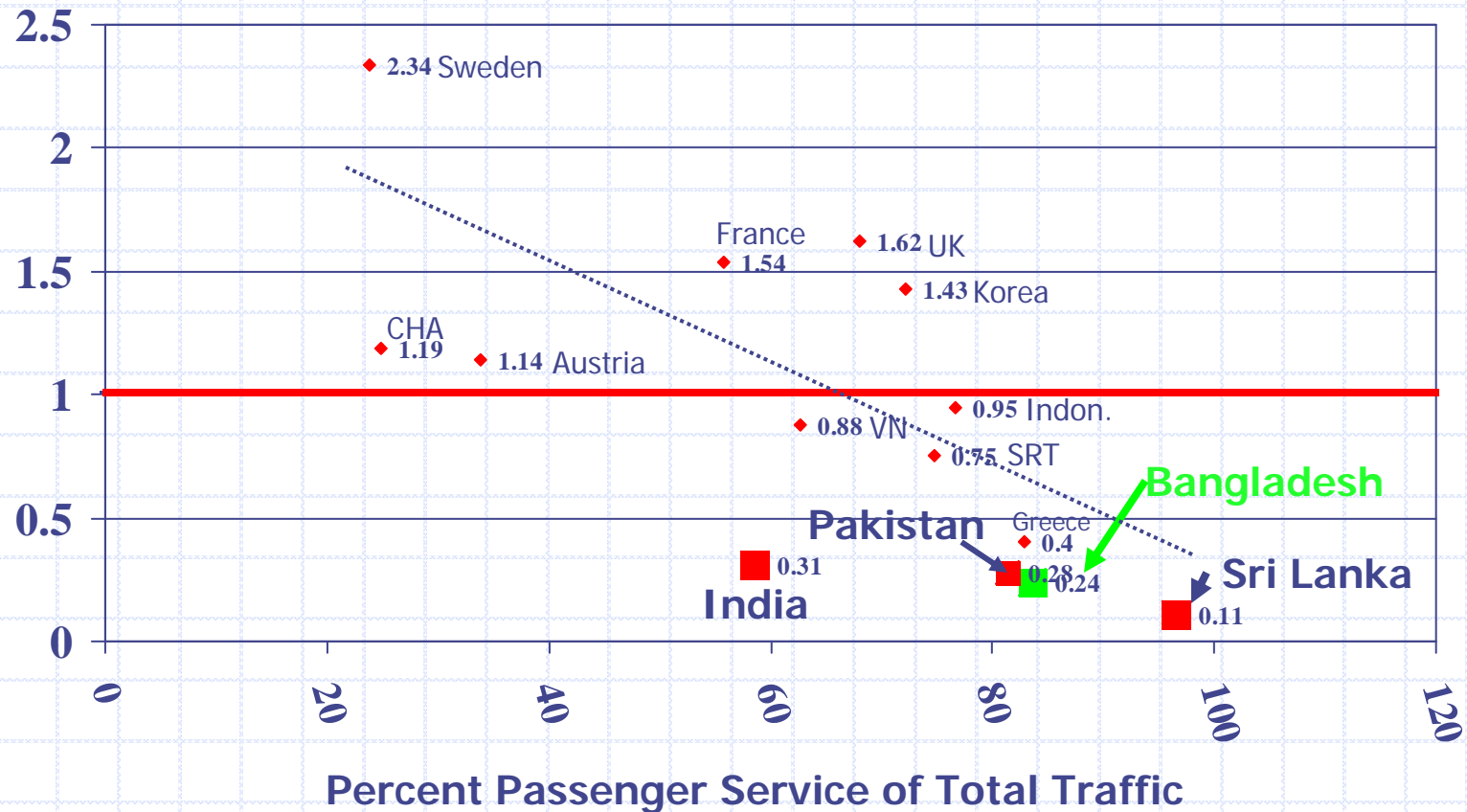
Percent Passenger Traffic

$P\text{-Km}/(P\text{-Km}+T\text{-Km})$



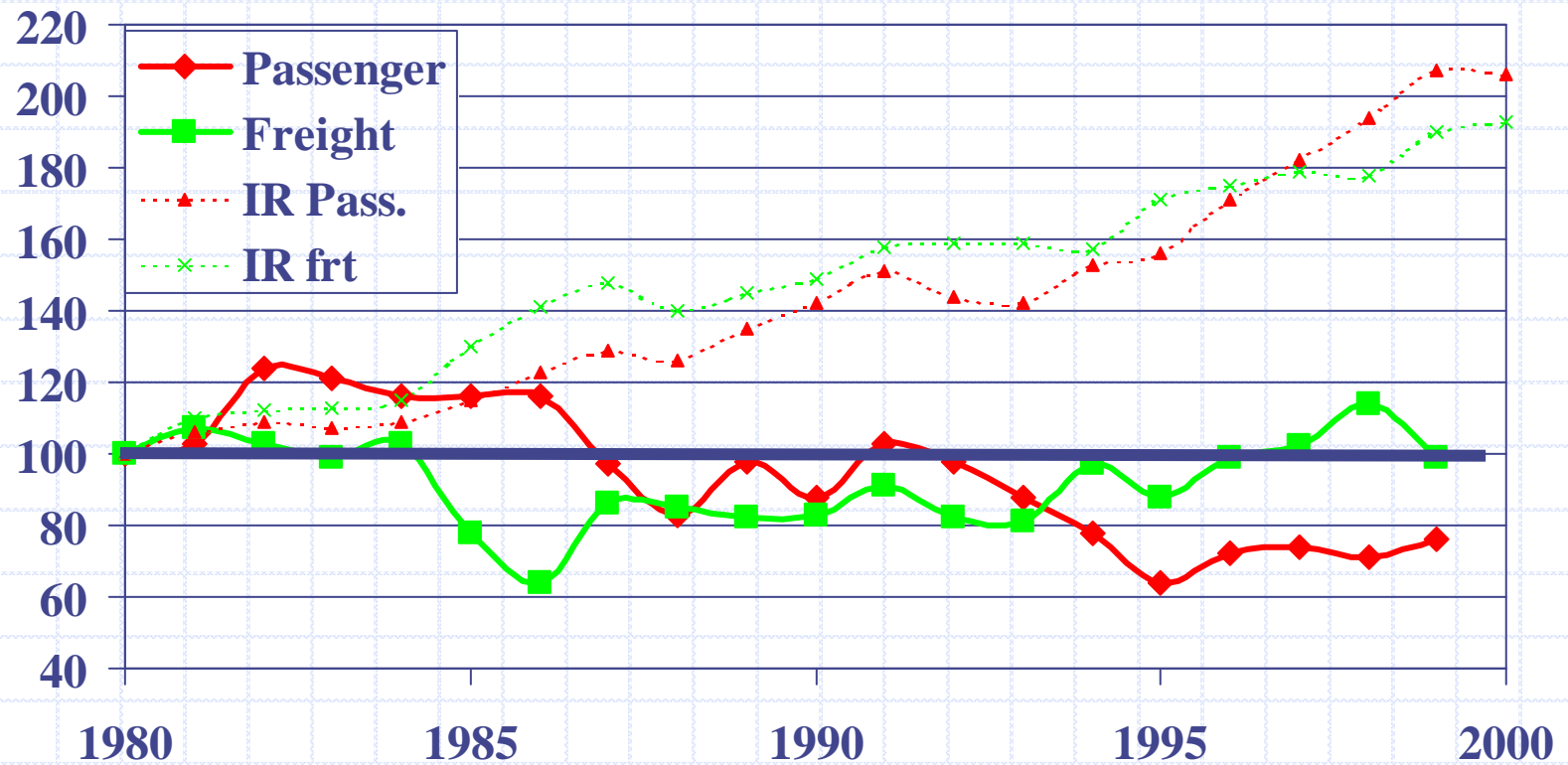
Fare Ratio vs. Percent Passenger Traffic: The Fatal Leverage

Ratio of Average Passenger Fare
To Average Freight Tariff



Bangladesh Rail Traffic Index (P-Km and T-Km)

1980=100



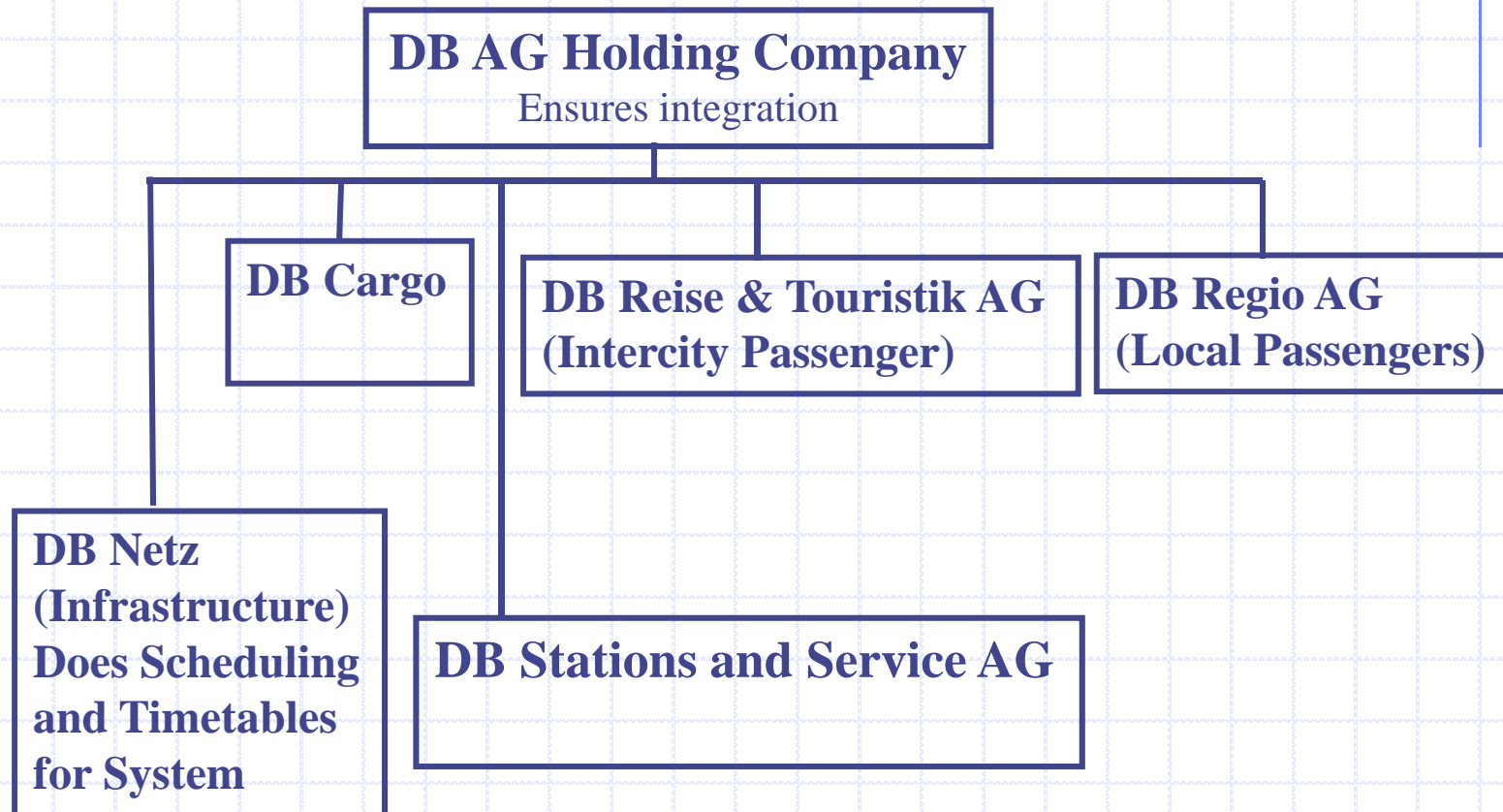
Reform is Vital

- ◆ Railway deficits
- ◆ Globalization
- ◆ Failure and collapse are possible
- ◆ > Paradigm change: what do we need railways for?

Services and Markets

- ◆ Commercial: freight, intercity passenger
- ◆ “Social”: urban and regional passenger
- ◆ The Core Business (LOB) concept
- ◆ LOB data for management
- ◆ European Commission **requirement**.
“Profit Centers” for services and infrastructure

Deutsche Bahn – a Typical Railway Structure



Services and Structure

- ◆ Intercity, Suburban/Regional and Freight are different markets, need focused management
- ◆ Non-core services taken out
- ◆ Organization options emerging:
 - The old monolith
 - Dominant operator, incremental user (North American and concessioning model)
 - Infrastructure separation (E.U. model and others)
- ◆ Ownership – can be public, private, partnerships

Structures Compared

- ◆ Dominant integral with minority users
 - Emerged naturally
 - Clarifies performance of minority operators
 - Coordination with dominant user protected
 - **But**, minority operators are at risk
- ◆ Complete separation:
 - Equality of access
 - Improved market focus of operators (and infrast.)
 - Promote rail vs rail competition
 - Enhanced clarity of policy and expenditures
 - Facilitate private entry into parts of system
 - Facilitate partial transition
 - **But**, complexity and coordination challenges
- ◆ Choice depends on **YOUR** objectives

Ownership Options

- ◆ Traditionally public (except in US and Canada), but many railways originally private
 - Ministry versus SOE – few ministries left
- ◆ “Partnerships” such as concessions or franchises, or private/public operation on public/private track
- ◆ Totally private (US model -- except for Amtrak and suburban operators)

Directions of Railway Change

Private Involvement

Structural Change

	Public Ownership	Partnerships: Concessions or Franchises Awarded	Private Ownership
Integral	China, Russia and India (ministries), MAV, SRT, MZ, others, (SOE's) Bangladesh?	Argentina (13), Brazil (9), Mexico (5), Peru (3), Guatemala, Bolivia (2), Panama, Cote d'Ivoire/Burkina Faso, Cameroon, Congo (Brazzaville), Malawi, Madagascar, Jordan	New Zealand, Ferronor (Chile), CVRD (Brazil), A&B (Chile)
Dominant Integral, Separated Minority Operators	Amtrak, VIA, Japan Freight	Mexico City suburban, CONCOR (India)	US Class I, CN and CP, East/West/Central Japan Railways
Separation	E.U. and Chile passenger	Swedish suburban, FEPASA (Chile), LHS line (Poland)	U.K. franchises and EWS, Polish and Romanian freight

Mixtures and partnerships are possible!

Competition Objectives

◆ IN the market

- Parallel tracks
- Trackage rights
- Competitive access (EU or Canada)

◆ FOR the market

- Exclusive concessions, positive or negative.

◆ Does rail vs. rail competition matter in Bangladesh?

We Have Very Wide Experience With Change

- ◆ Latin America
- ◆ Africa
- ◆ EU
- ◆ CEE countries
- ◆ Japan
- ◆ India, China, Russia
- ◆ Experience has been strongly (with exceptions) positive

Conclusions/Lessons

- ◆ Rich Collection of Experience – change **works**
- ◆ The metric: “Compared to what?” (UK)
- ◆ Mixed solutions work -- for structure, ownership and competition – **avoid either/or**
- ◆ Deal with social issues:
 - Labor
 - Environment
 - Interest groups
 - The poor
- ◆ Do **something** – mistakes can be fixed, but inaction is forever

Issues in Bangladesh

- ◆ LOB advantages (freight, intercity passengers, suburban passengers)?
- ◆ MG and BG: separate LOB's?
- ◆ Competition objectives?
- ◆ Ownership objectives?

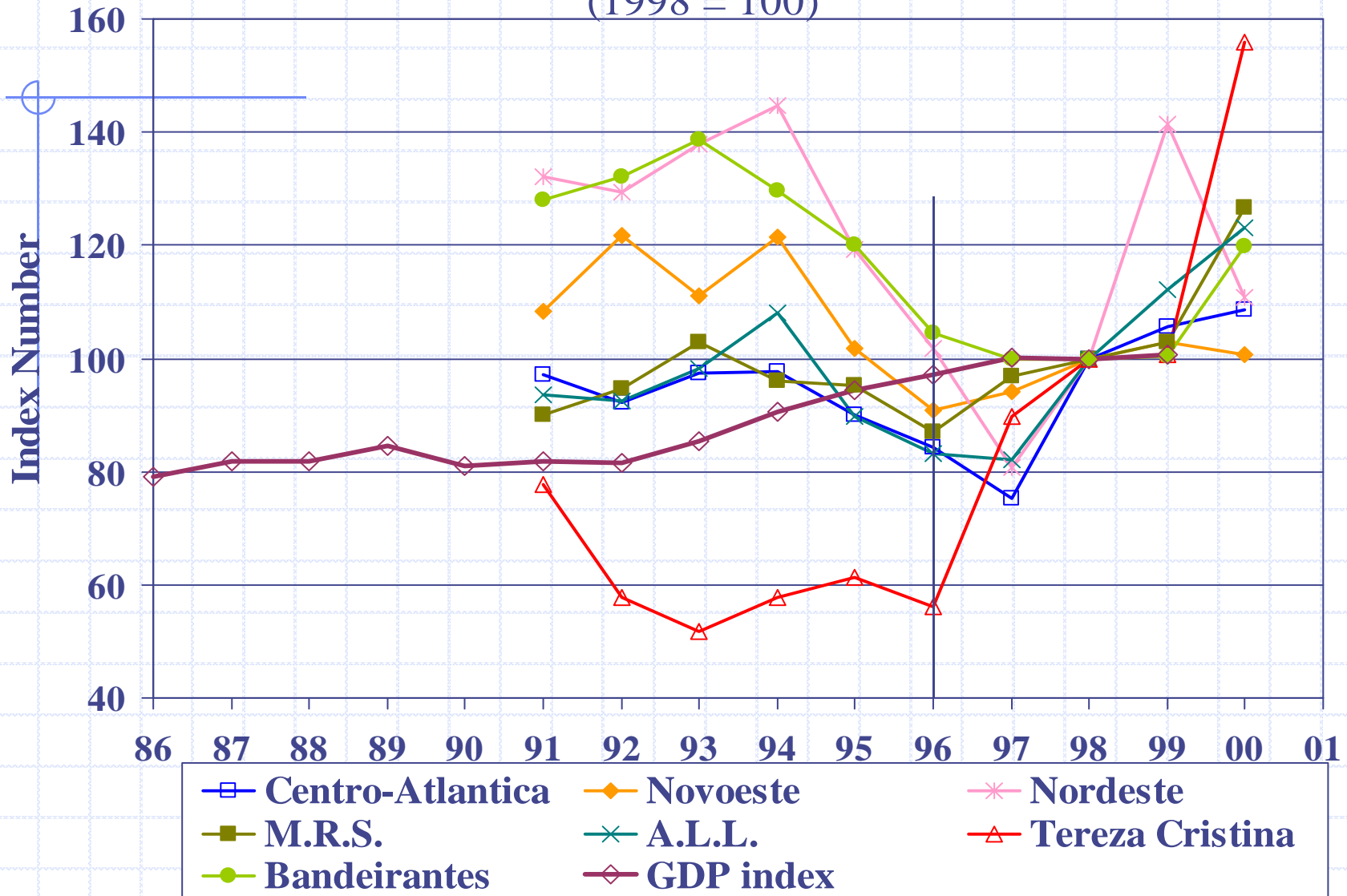
Railway Concessions

- ◆ Began in Argentina in 1991
- ◆ Now 13 countries with concessions -- freight (32), inter city passenger (2), suburban passenger (8) and Metros (4)
- ◆ **All** American railways are privately operated
- ◆ A concession is NOT a sale of assets: it is, instead, a transfer of control for a period
- ◆ Concessions can be either payment **to** government for use of assets or payment **by** government for subsidy and capital program
- ◆ Experience to date has been highly positive



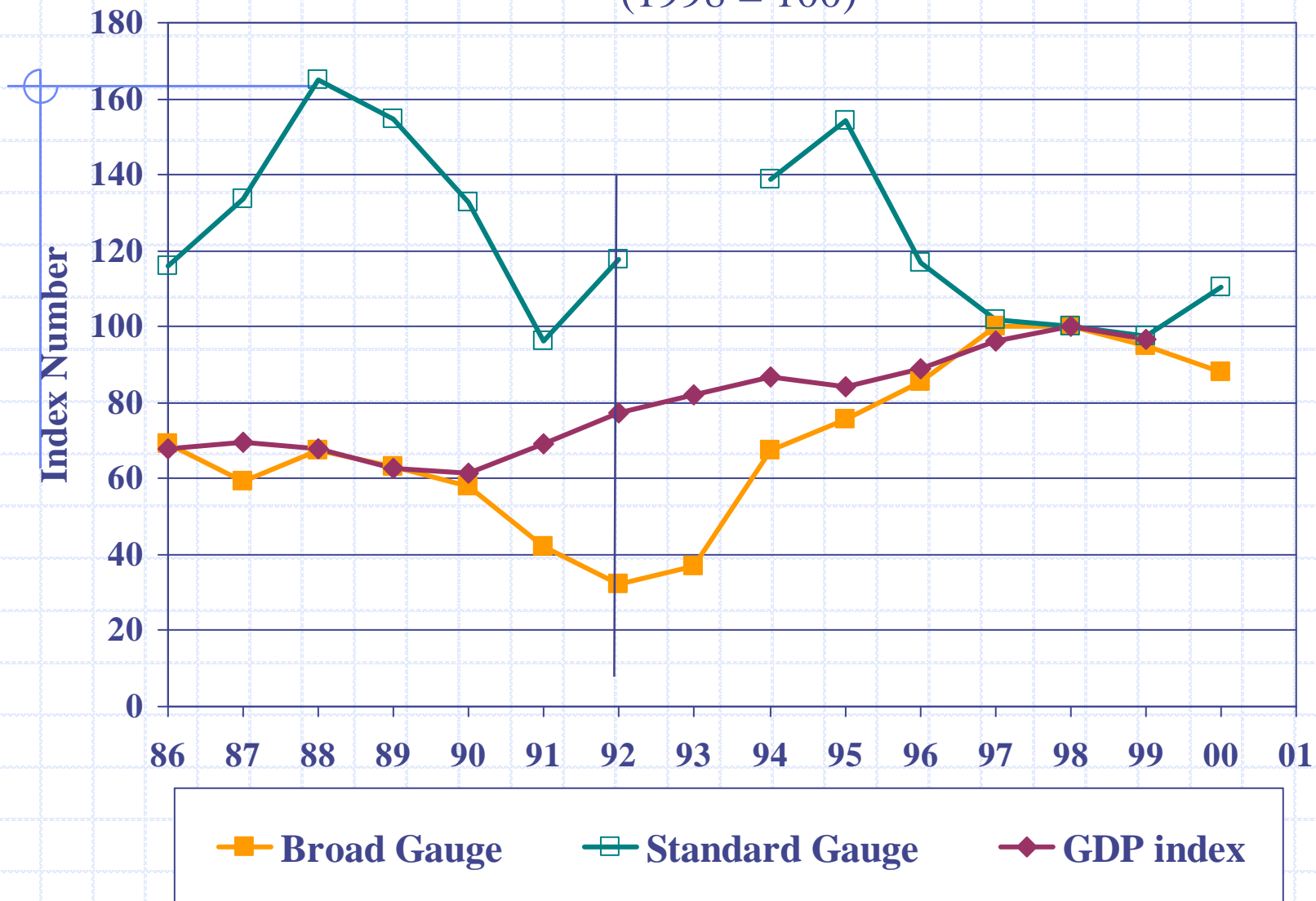
BRAZIL - Output (ntkm) and GDP

(1998 = 100)



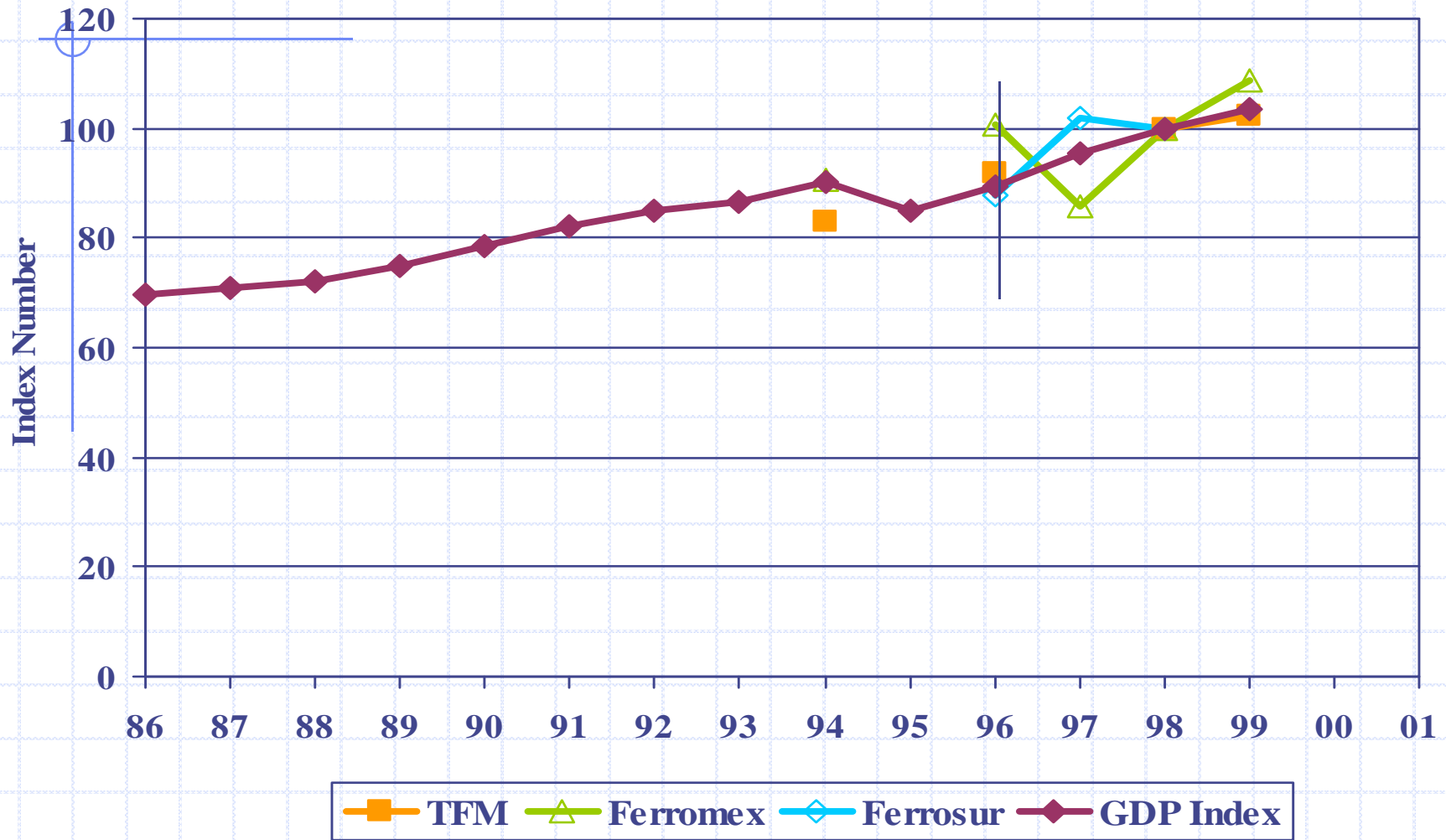
ARGENTINA - Output (ntkm) and GDP

(1998 = 100)

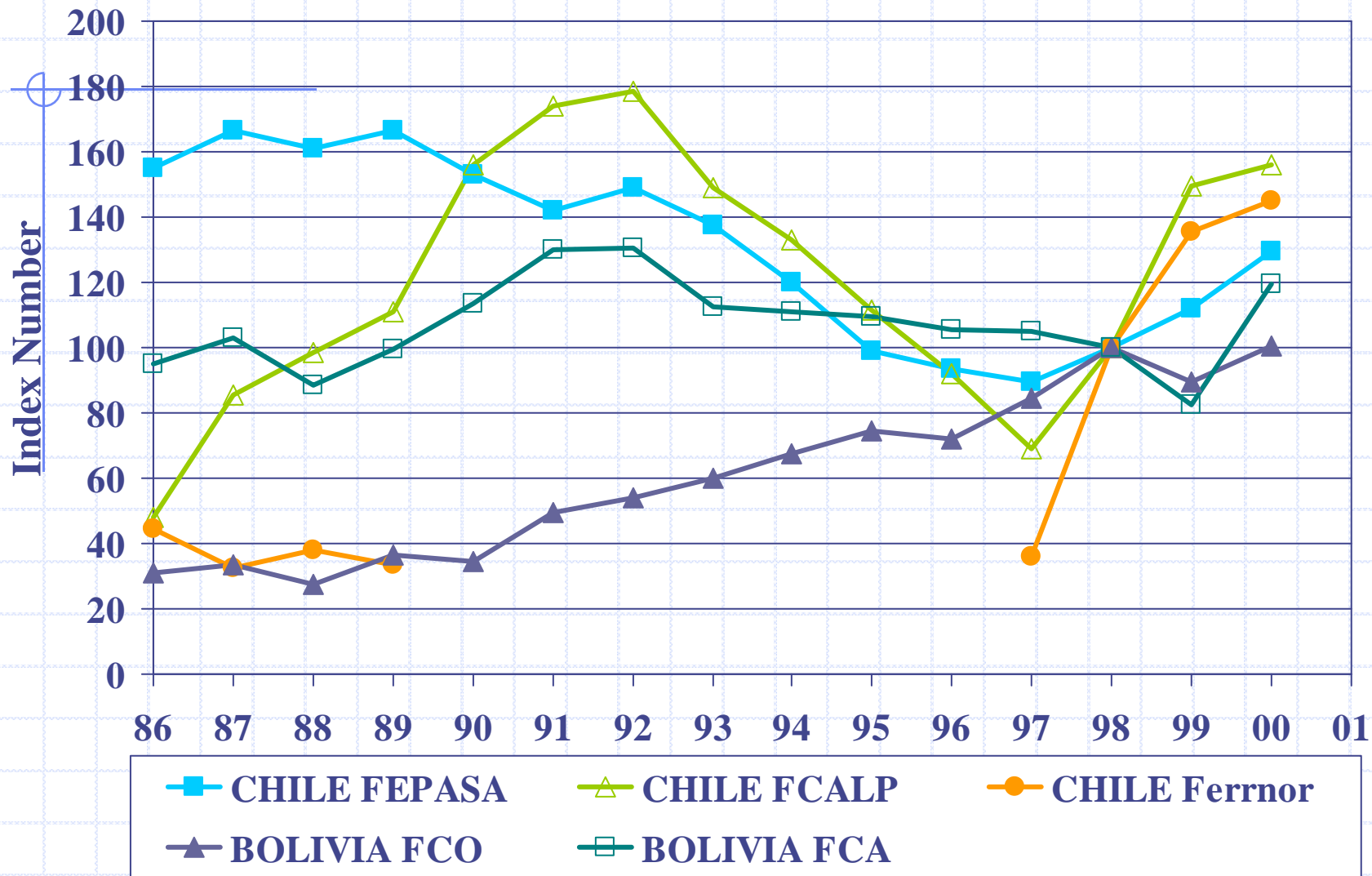


MEXICO - Output (ntkm) and GDP

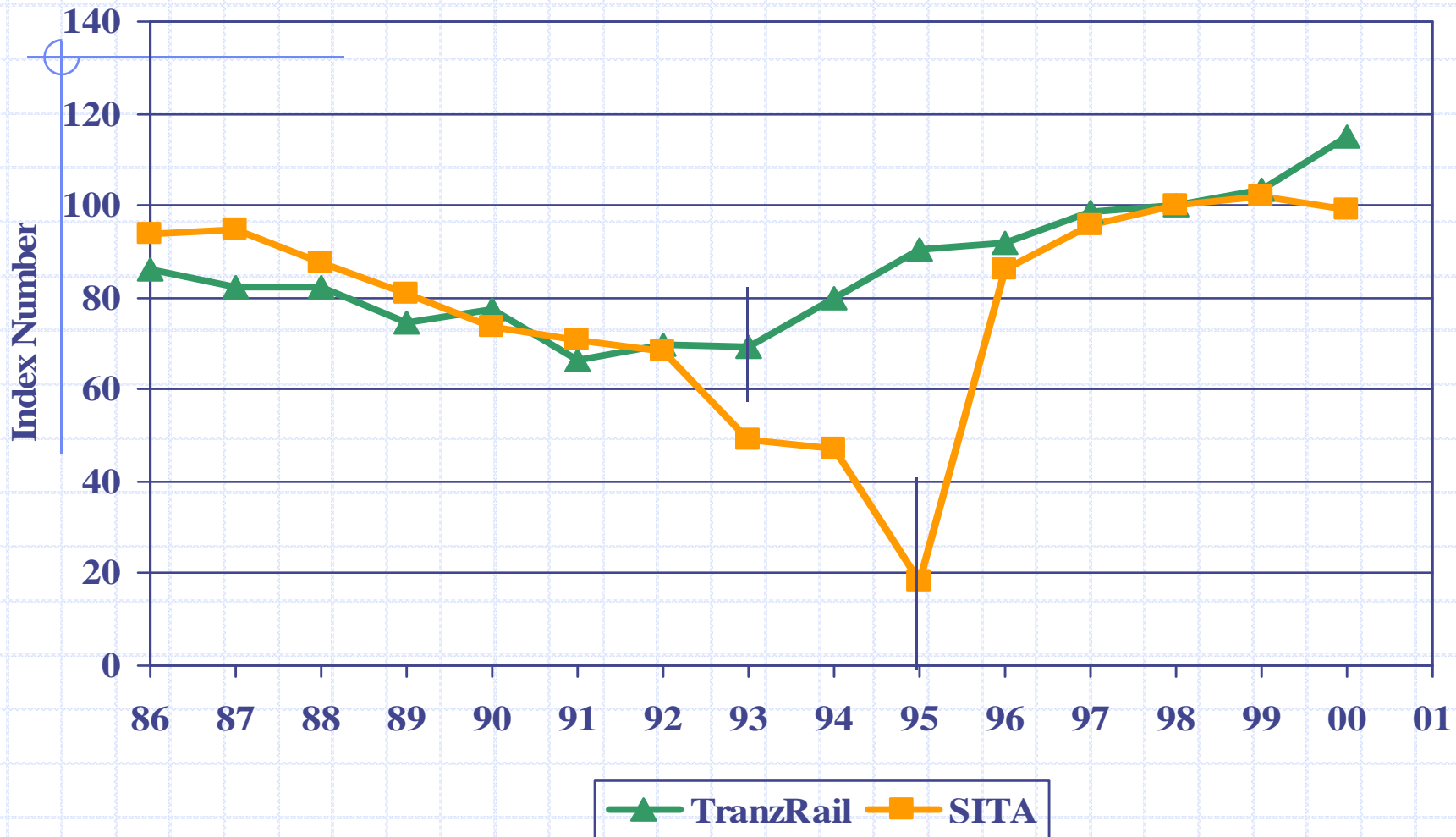
(1998 = 100)



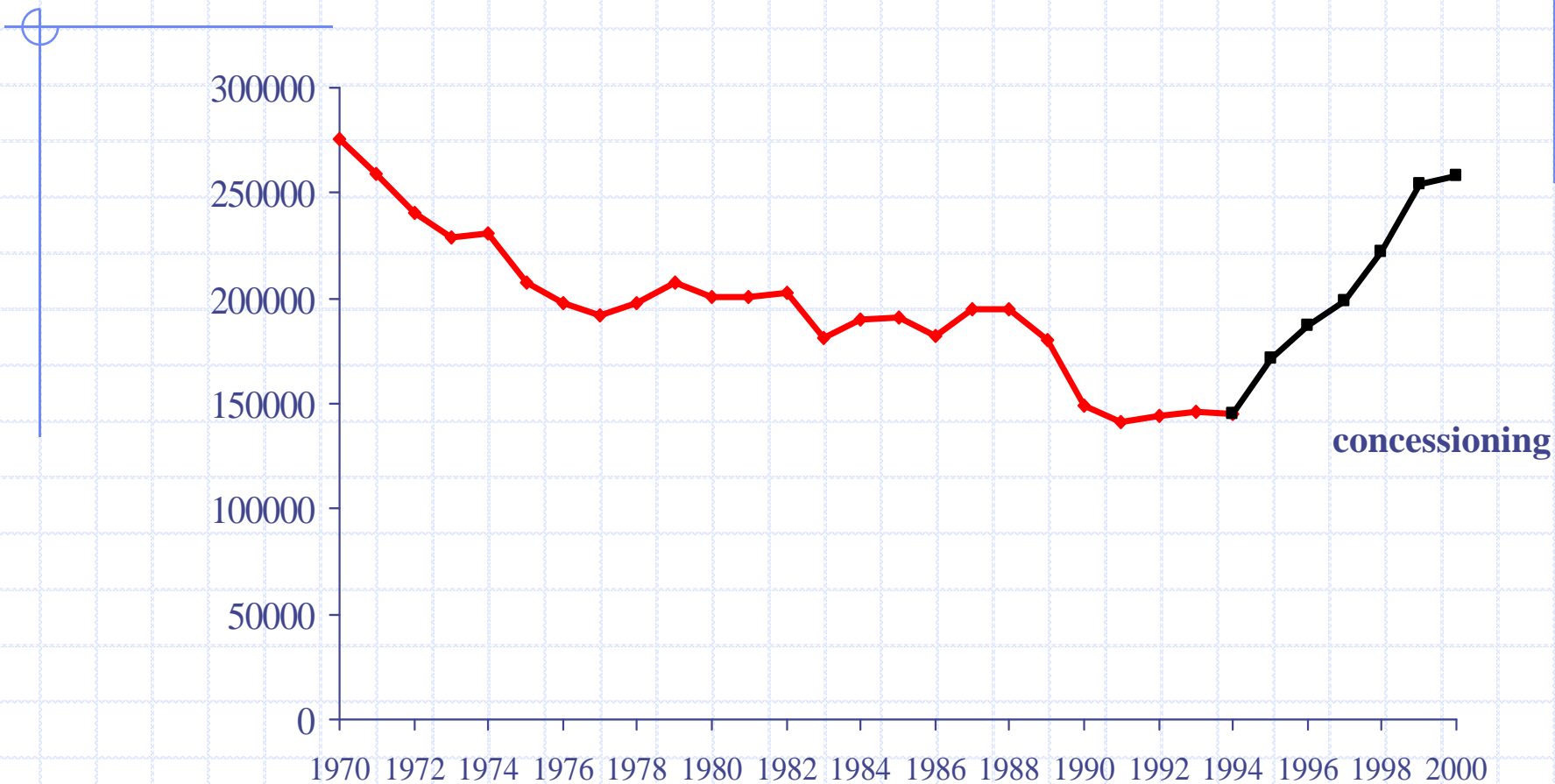
LATIN AMERICA - Output (ntkm) (1998 = 100)



OTHER - Output (ntkm) (1998 = 100)

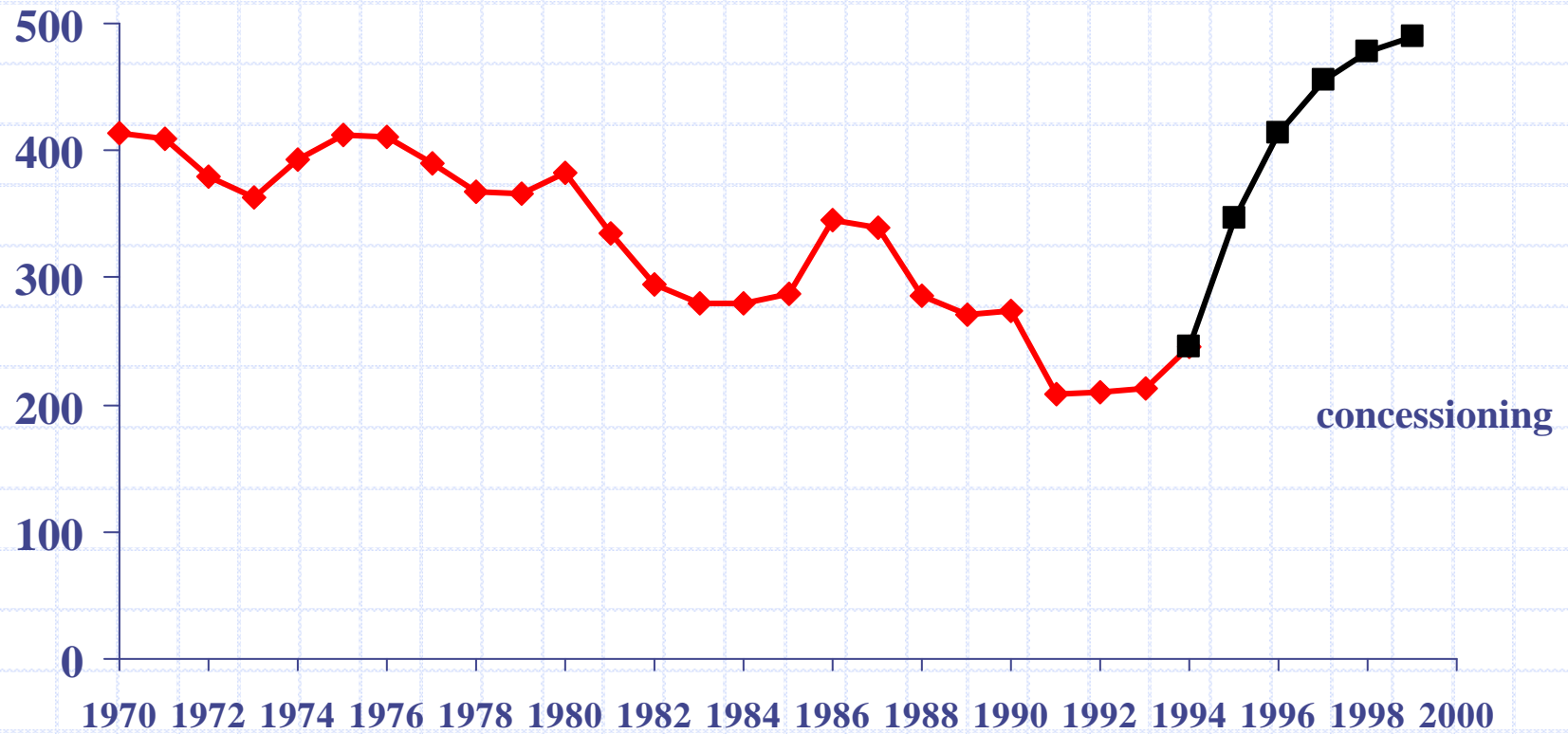


Buenos Aires Metro Passengers: 1970 to 2000 (000 passengers)

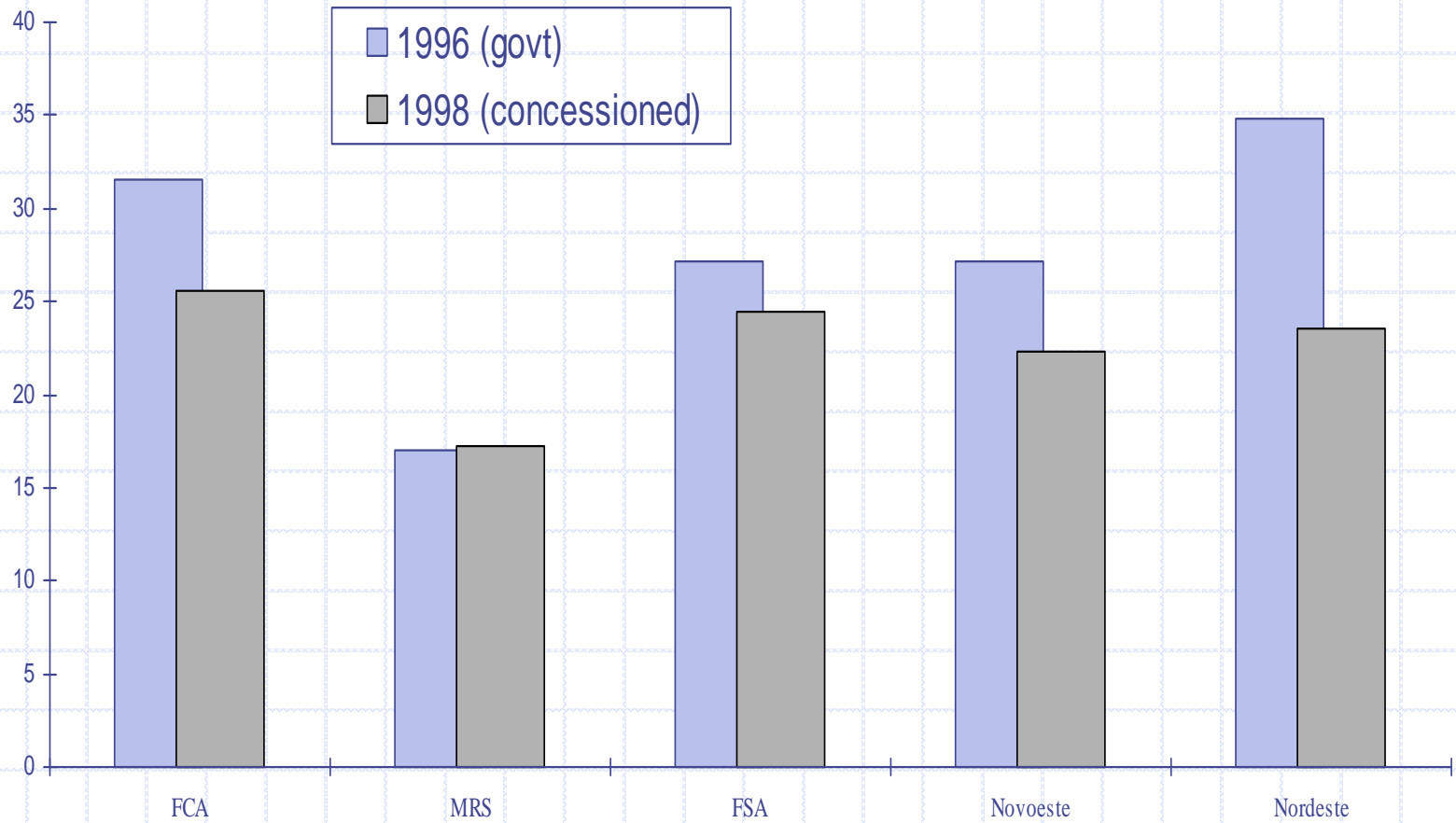


Suburban Rail Passengers in Buenos Aires

(millions of passengers)



Rail Freight Tariffs in Brazil Before and After Concessioning (R\$/000 T-Km)



Freight tariff savings after concessioning

	Initial Year	Tariff in initial year (PPP\$/Ton-Km)	Tariff in ending year (PPP\$/Ton-Km)	Ton-km in ending year	Total savings (million of PPP \$)	% tariff reduction
Cote d'Ivoire	95	0.123	0.106	523	8.9	13.8
Argentina Broad Gauge	93	0.039	0.036	6,898	20.7	7.7
Argentina Standard Gauge	94	0.032	0.043	495	(5.4)	-34.4
Bolivia FCO	96	0.147	0.123	626	15.0	16.3
Bolivia FCA	96	0.061	0.098	557	(20.6)	-60.7
Brazil:						
FCA	96	0.051	0.032	7,268	138.1	37.3
Novoeste	96	0.043	0.027	1,588	25.4	37.2
Nordeste	96	0.056	0.026	709	21.3	53.6
MRS	96	0.027	0.022	26,837	134.2	18.5
ALL	96	0.044	0.033	10,285	113.1	25.0
Tereza Cristina	96	0.120	0.101	259	4.9	15.8
Bandeirantes	98	0.038	0.023	5,984	89.8	39.5
Chile Fepasa	94	0.089	0.053	1,189	42.8	40.4
Chile Ferronor	96	0.072	0.046	743	19.3	36.1
Mexico – TFM	97	0.054	0.043	17,256	189.8	20.4
Mexico – Ferromex	97	0.041	0.036	20,638	103.2	12.2
New Zealand	92	0.104	0.081	4,078	93.8	22.1
Total					994.2	

Labor Issues Matter

“Workers eventually benefit from economic reform as states move from central planning to market systems and from protectionism to openness. The change, however, can be wrenching as employment and wages often decline temporarily and as workers have to move from old to new jobs. There remains a need for governments to provide strong support to workers and their families in such times of transition.” [1]

[1] James D. Wolfensohn, from World Bank Development Report 1995, “Workers in an Integrating World,” The World Bank, Washington, DC 1995, page iii

Questions In Railway Labor Redundancy

- ◆ What does “redundant” mean?
 - Financial definition
 - Economic definition
 - Political dimension
- ◆ How much redundancy is there?
- ◆ Financial and economic benefits of reducing redundancy
- ◆ Assisting the transition
- ◆ Transition issues
- ◆ Results to date

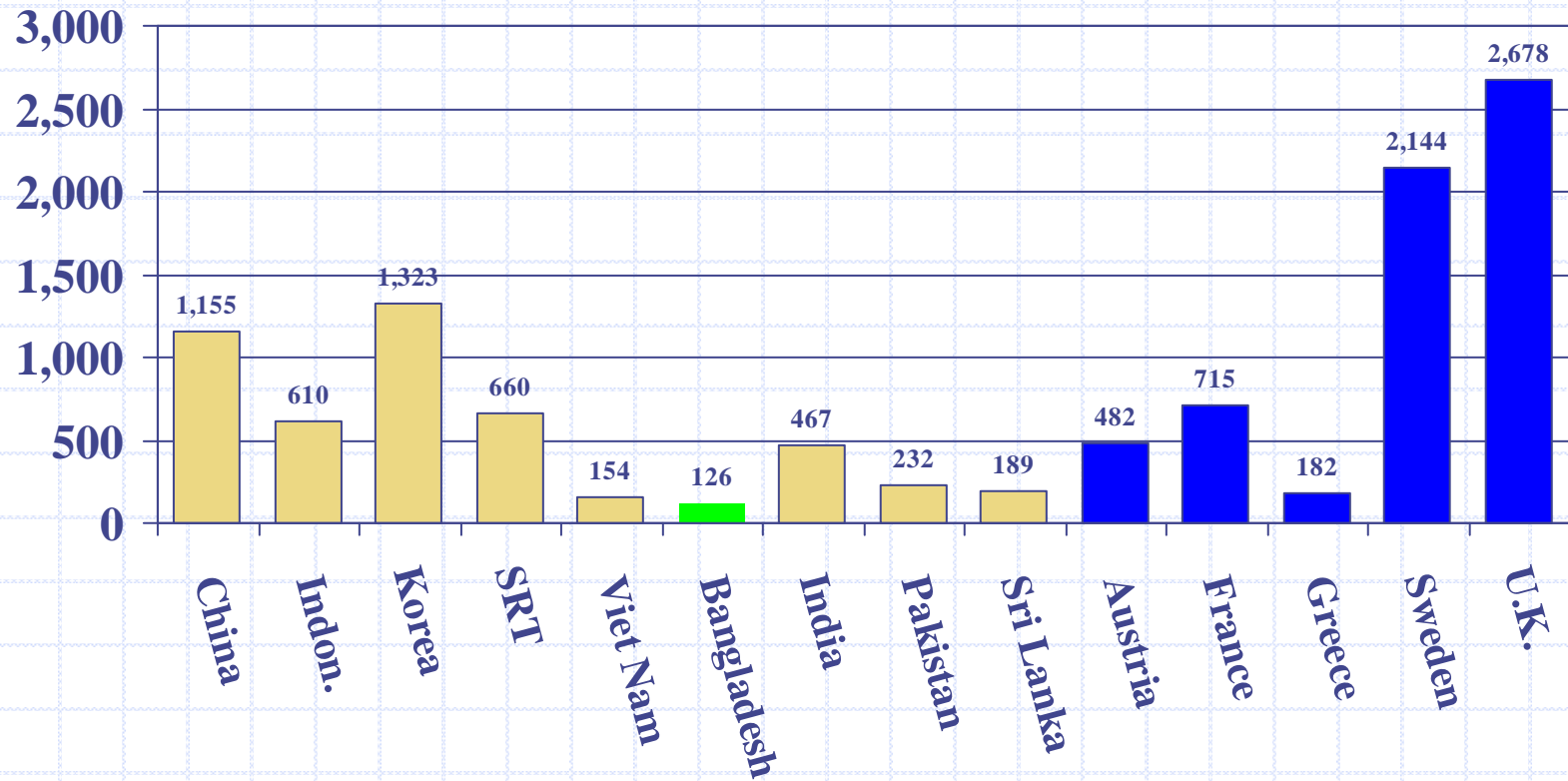
What does “redundant” mean?

- ◆ **Financial:** If the value of the worker’s production for the enterprise is less than the cost of wages and benefits, the worker is redundant
- ◆ **Economic:** If the value of the worker’s production to the economy is less than the cost to the society, the worker is redundant and should be relocated to where output is greater than cost
- ◆ **Political/Social dimension:** transition from railway to other employment has large emotional, economic and financial costs that must be defined, discussed, negotiated and managed

How much redundancy?

- ◆ No fixed measure: depends both on productivity and wage levels
- ◆ In railways, depends on specific factors such as traffic mix and density and capital assets
- ◆ By any measure, considerable redundancy exists

Traffic Units/Employee



$$TU = T - Km + P - Km$$

Defining the benefits and costs

◆ **Financial**

- Benefits: wage and benefits savings (retirement, housing, office space, etc), improved management climate, higher morale and efficiency, higher wages
- Costs: transition payments, retraining of existing employees, transitional conflict

◆ **Economic**

- Benefits: new wages earned (when earned)
- Costs: Transition program, especially if prior retirement program was under funded

- ◆ **Rates of return:** NPV of benefits and costs. Tend to be higher for financial than economic

Assisting the transition

- ◆ Early retirement
- ◆ Severance benefit, based on final wages and length of service
- ◆ Relocation (including housing)
- ◆ Retraining before/after, general or specific vocational?
- ◆ Good communications
- ◆ Help to start new businesses?
- ◆ Worker (former and continuing) participation in new enterprises?

Transition issues

- ◆ Is private sector involved? If so, **who** pays labor, and who makes what decisions?
- ◆ **When** to do labor transition: before, during or after restructuring or privatization?
- ◆ Assistance to **all** employees, or only to affected employees
- ◆ Predicting the balance of measures **actually** chosen by employees

Results to date

- ◆ Three examples: Argentina, Brazil and Mexico
- ◆ Other recent experiences: Poland and Estonia, Cote d'Ivoire/Burkina Faso, Bolivia, Peru, Croatia
- ◆ How many employees affected
- ◆ Impact on productivity and costs

Example labor programs

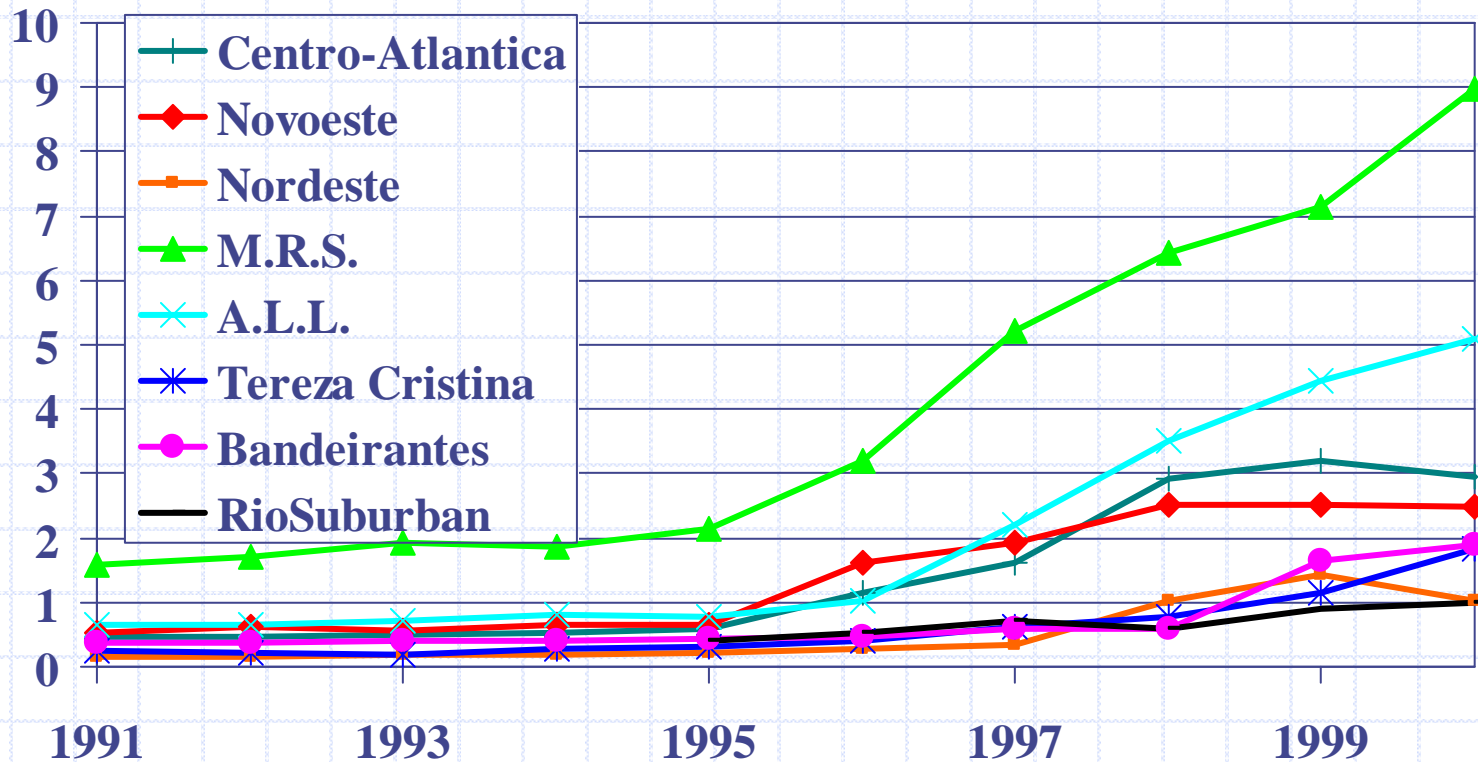
	Employment Before/After	Early Retirement	Severance Benefits	Relocation Assistance	Retraining	Worker Participation in New Company
Argentina	82,000/12,900	50/55	1 month salary per year of service	No	No	Yes (3%)
Brazil	54,000/14,300	25/20 years service	1 to 2 months salary per year of service	Yes	Yes -- rail-specific and little used	No
Mexico	46,800/16,000	None- but sale value funded pensions	Single payment for value of Government employment rights	No	No	No
Poland	205,000/165,000	50/55	PZI 20,000/30,000, defined by unemployment rate in area of employment	No	Yes -- little used	No
Estonia	4,481/2,464	Up to 2 years with 50 % wages	Standard in law. 2-4 months bonus, plus notice payments plus 6 months unemployment	No	Yes -- centrally provided	No

Labor Force Changes in Concessioned Railways

	Labor Force in Year Before Concessioneing	Labor Force in Most Recent Year	Percent Reduction
Freight Concessions			
Argentina	67,000	5,300	92.1
Brazil	49,896	12,251	75.4
Bolivia	3,900	785	79.9
Mexico	46,823	16,000	65.8
Cote d'Ivoire/Burkina Faso	1,811	1,673	7.6
Passenger Concessions			
Buenos Aires Suburban	15,000	7,600	49.3
Buenos Aires Subté	4,750	2,100	55.8
Rio Suburban	4,170	2,236	46.4
Rio Metro	3,272	1,534	53.1

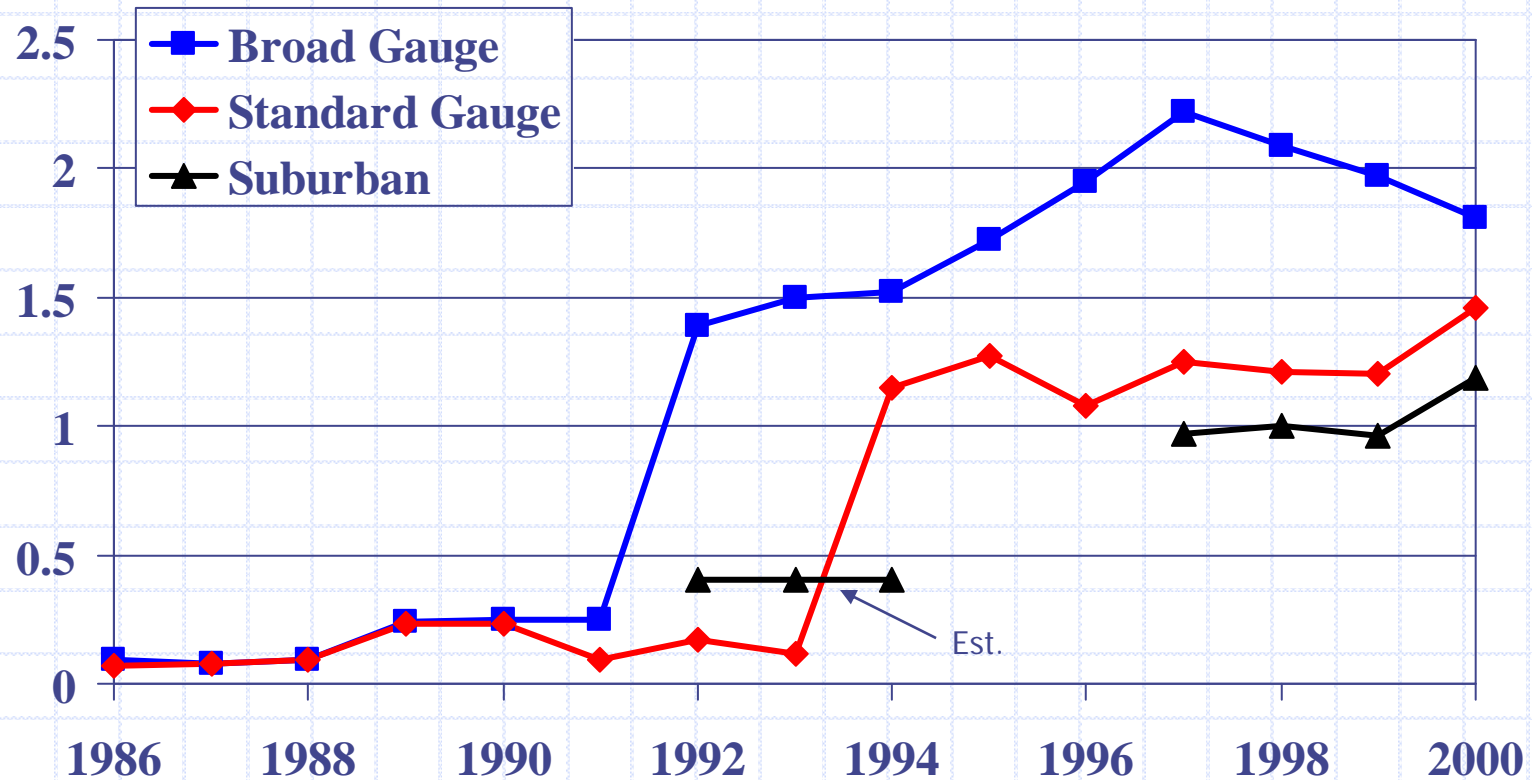
Brazil rail labor productivity

(000,000 TU/Employee)



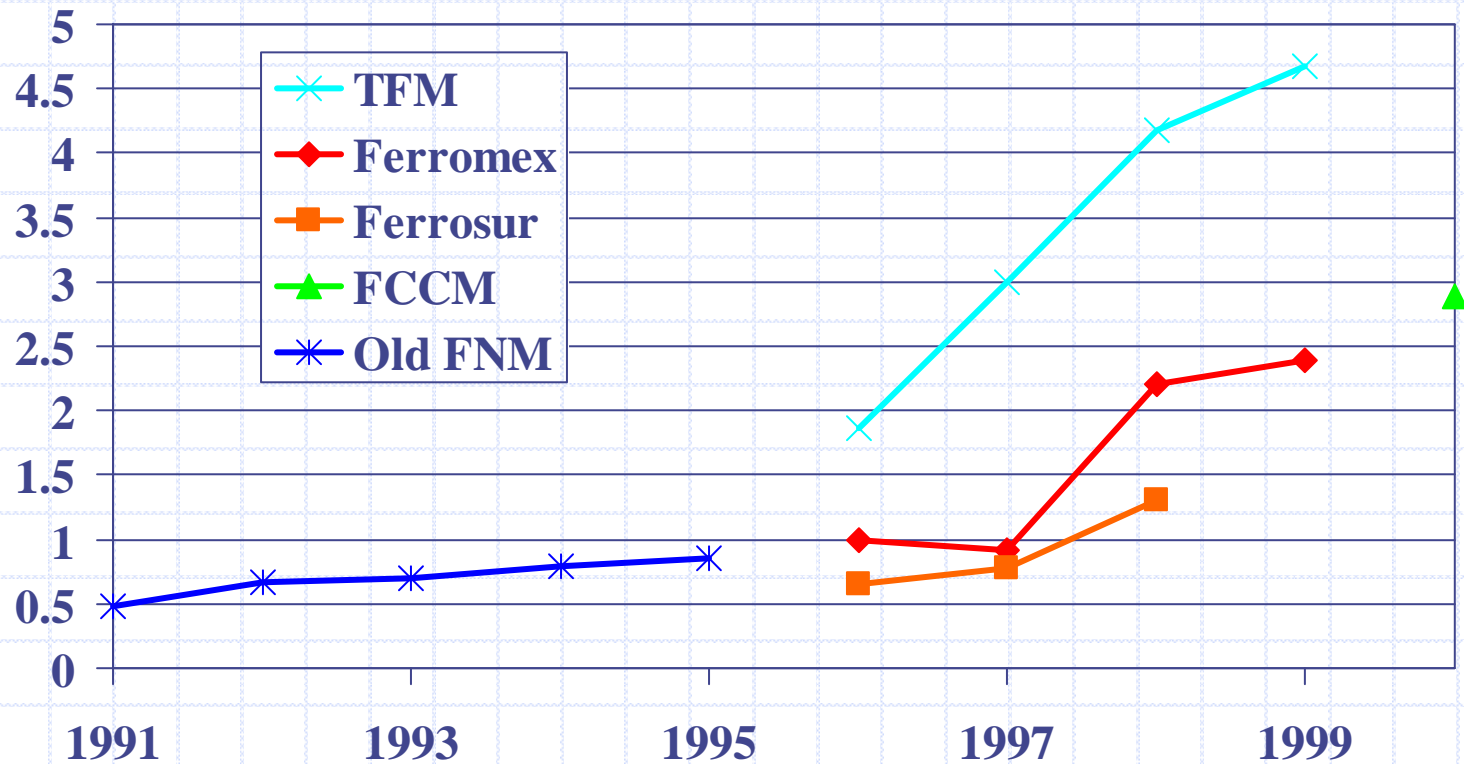
Argentina rail labor productivity

(000,000 TU/Employee)



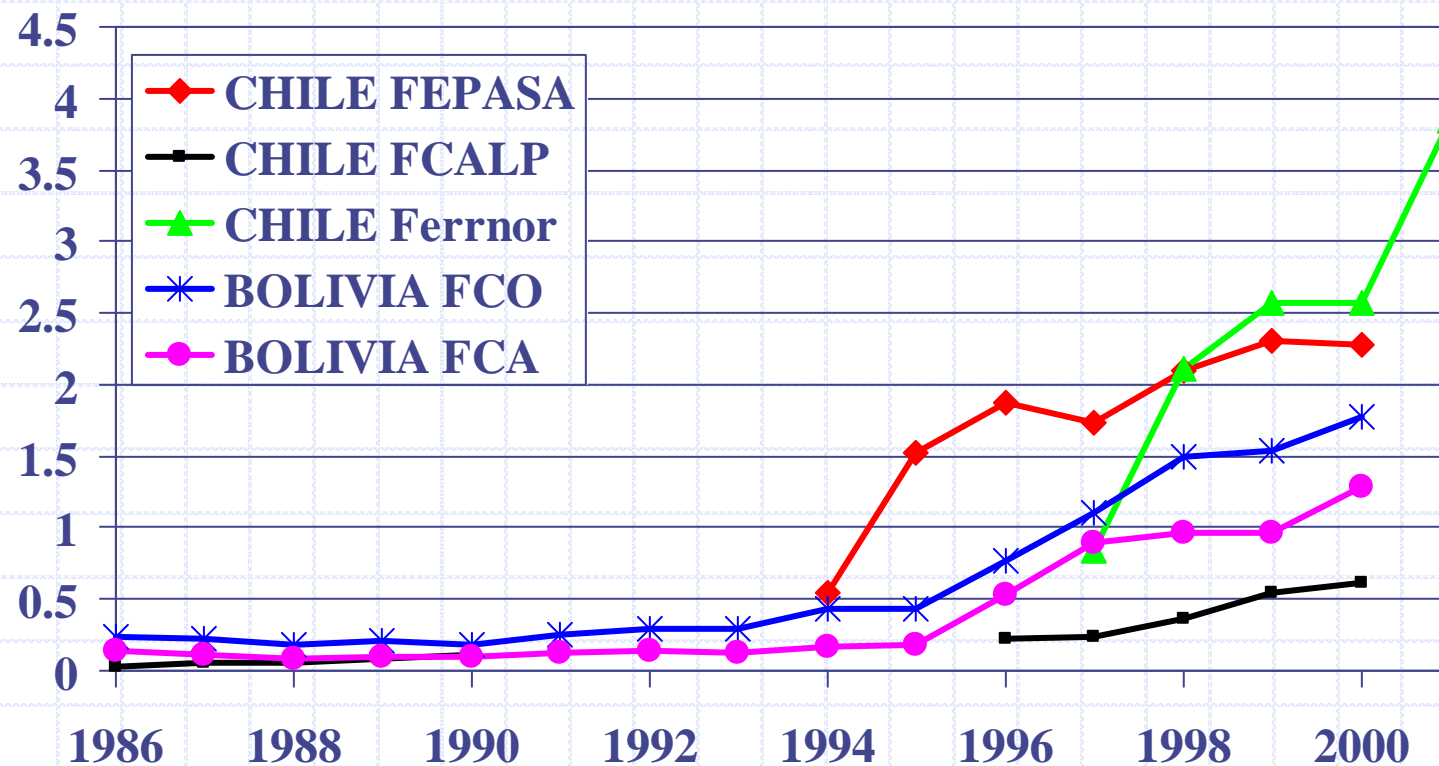
Freight rail labor productivity in Mexico

(000,000 TU/Employee)



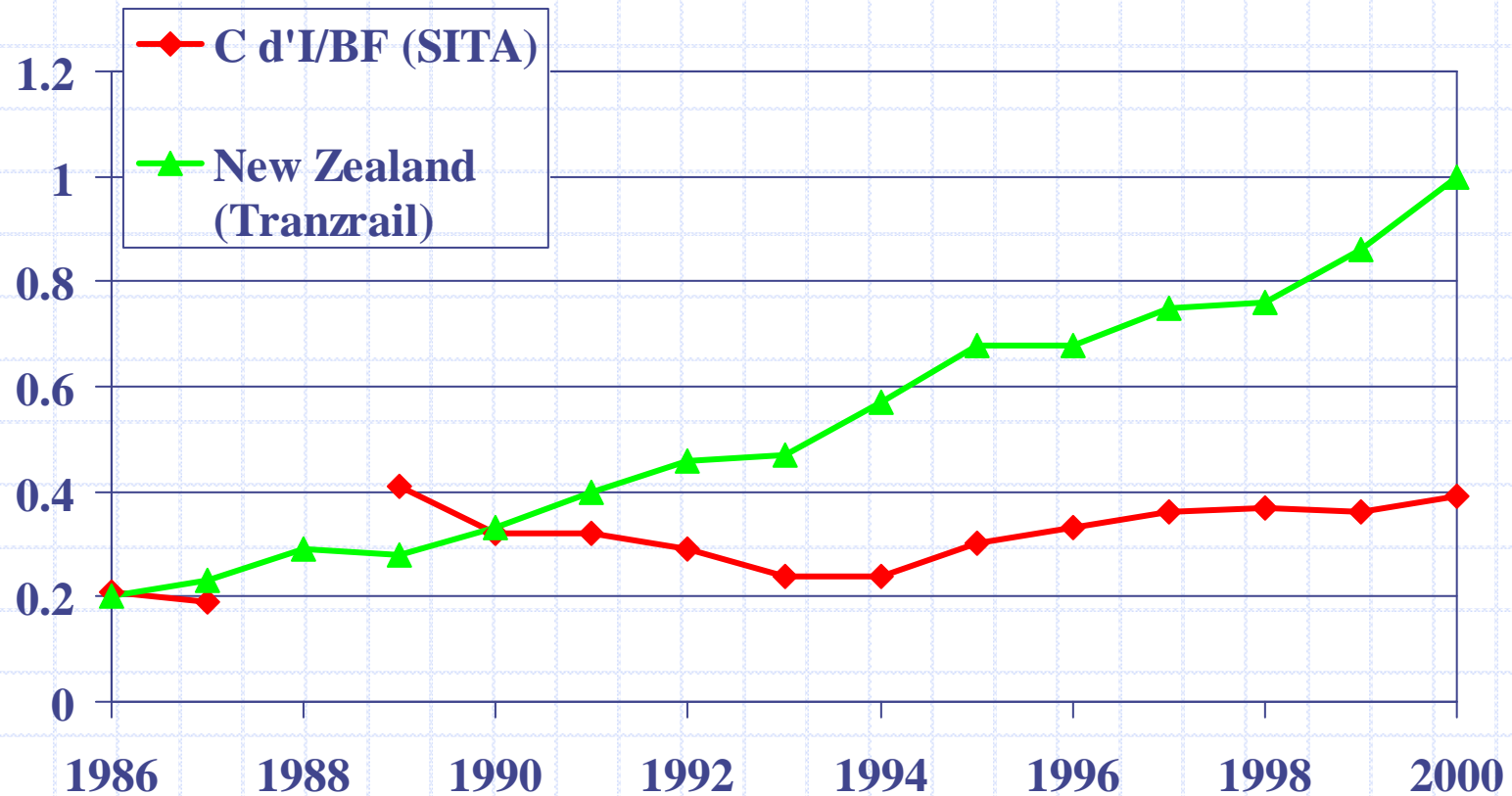
Freight rail labor productivity in Chile and Bolivia

(000,000 TU/Employee)



Rail labor productivity in Cote d'Ivoire/Burkina Faso and New Zealand

(000,000 TU/Employee)



	Year	Km of line	Tons (000)	Ton-km (000,000)	Pass. (000)	P-Km (000,000)	Employees	Locomotives	Wagons	Coaches	MU Fleet
Primarily Freight Concessions											
Argentina											
Ferroespresso Pampeano	2000	5,094	2,538	877			810	45	1,871		
Nuevo Central Argentino	2000	4,512	5,520	2,490			1,311	92	5,354		
Ferrosur Roca	2000	3,342	3,079	1,263			772	47	4,634		
Buenos Aires al Pacifico	2000	5,252	2,928	2,268			914	110	5,258		
Ferrocarril Mesopotamico -- FMGU	2000	2,739	1,000	495			339	47	2,139		
Bolivia											
Empresa Ferroviaria Oriental	2000	1,244	1,042	626	462	192	461	23	861	54	2
Empresa Ferroviaria Andina	2000	1,499	817	557	192	72	324	30	1,015	42	
Brazil											
Ferrovía Centro-Atlántica S.A.	2000	7,263	19,608	7,268			2,596	294	8,143		
Ferrovía Novoeste S.A.	2000	1,621	2,660	1,588			639	83	2,290		
Companhia Ferroviária do Nordeste	2000	4,381	1,370	709			694	93	1,246		
MRS Logística S.A.	2000	1,675	66,072	26,837			2,988	336	12,346		
América Latina Logística	2000	6,355	17,510	10,285			2,018	336	9,862		
Ferrovía Tereza Cristina S.A.	2000	174	3,649	259			142	10	379		
Ferrovias Bandeirantes S.A.	2000	4,236	14,947	5,984			3,174	300	11,057		
Chile											
FEPASA	2000	2,379	5,066	1,189			521	79	3,400		
Ferromor	2000	2,229	6,300	743			360	24	525		
Ferrocarril Arica-La Paz	2000	206	281	59			95	11	300		
Mexico											
TFM	1999	5,176	26,729	17,256			3,694	427	11,898		
Ferromex	1999	10,724	25,894	20,638	248	80	8,666	494	12,900		
Sureste	1999	1,479	11,453	4,734			2,097	180	4,180		
FCCM	2000	1,869	2,069	1,017			352	35	444		
Panama											
	2000	76									
Cote d'Ivoire/Burkina Faso -- SITARAIL	2000	639	876	523	300	126	1,673	20	766	52	
Malawi -- Central East African Railways	2000	710	446	82	424	25	642	12	380	28	
New Zealand -- Tranzrail	2000	3,904	14,699	4,078	11,751	470	4,064	343	5,948	159	162
Passenger Concessions											
Argentina											
Ferrovias	2000	54			36,553	617	615	20		113	
Transmet -- San Martin	2000	56			49,592	1,152	656	44		152	
Transmet -- Belgrano Sur	2000	66			16,343	312	657	25		93	1
Transmet -- Roca	2000	261			155,041	2,472	2,227	58		373	
TBA -- Mitre	2000	186			81,731	1,456	1,648	14		184	
TBA -- Sarmiento	2000	184			111,518	2,619	1,398	13		247	8
Metrovias -- Urquiza	2000	32			25,115	434	440	1			128
Metrovias -- Subte (Metro)	2000	47			258,825	1,124	2,056				586
Brazil											
Supervia	2000	200			80,500	2,247	2,236				122
Rio Metro	2000	35			97,479	487	1,534				210
France											
	2000	31,423	137	53,438	850,200	66,495	174,400	5,006	48,330	15,764	2,123
Germany											
	1999	37,477	279	71,494	1,698,310	72,543	194,901	7,441	128,990	20,297	4,874
Bangladesh											
	2000	2,768	3	777	38,600	3,941	37,439	231	10,929	1,282	

	Productivity Indicators						
	TU/ Employee (000,000)	Average Lead -- Freight (Km)	Average Lead -- passenger (Km)	TU/Km (000)	T-Km/ Wagon (000)	P-Km/ Coach + MU (000)	TU/ Locomotive + Adj MU (000)
Primarily Freight Concessions							
Argentina							
Ferrospresso Pampeano	1.08	346		172	469		19,489
Nuevo Central Argentino	1.90	451		552	465		27,065
Ferrosur Roca	1.64	410		378	273		26,872
Buenos Aires al Pacifico	2.48	775		432	431		20,618
Ferrocarril Mesopotamico -- FMGU	1.46	495		181	231		10,532
Bolivia							
Empresa Ferroviaria Oriental	1.77	601		658	727	3,429	35,057
Empresa Ferroviaria Andina	1.94	682		420	549	1,714	20,967
Brazil							
Ferrovía Centro-Atlántica S.A.	2.80	371		1,001	893		24,721
Ferrovía Novoeste S.A.	2.49	597		980	693		19,133
Companhia Ferroviária do Nordeste	1.02	518		162	569		7,624
MRS Logística S.A.	8.98	406		16,022	2,174		79,872
América Latina Logística	5.10	587		1,618	1,043		30,610
Ferrovía Tereza Cristina S.A.	1.82	71		1,489	683		25,900
Ferrovias Bandeirantes S.A.	1.89	400		1,413	541		19,947
Chile							
FEPASA	2.28	235		500	350		15,051
Ferromor	2.06	118		333	1,415		30,958
Ferrocarril Arica-La Paz	0.62	210		286	197		5,364
Mexico							
TFM	4.67	646		3,334	1,450		40,412
Ferromex	2.39	797		1,932	1,600		41,939
Sureste	2.26	413		3,201	1,133		26,300
FCCM	2.89	492		544	2,291		29,057
Panama							
Cote d'Ivoire/Burkina Faso -- SITARAIL	0.39	597		1,016	683	2,423	32,450
Malawi -- Central East African Railways	0.17	184		151	216	893	8,917
New Zealand -- Tranzrail	1.12	277	40	1,165	686	1,464	12,292
Passenger Concessions							
Argentina							
Ferrovias	1.00			17	11,363	5,460	30,850
Transmet -- San Martin	1.76			23	20,571	7,579	26,182
Transmet -- Belgrano Sur	0.47			19	4,727	3,319	12,397
Transmet -- Roca	1.11			16	9,471	6,627	42,621
TBA -- Mitre	0.88			18	7,828	7,913	104,000
TBA -- Sarmiento	1.87			23	14,234	10,271	182,721
Metrovias -- Urquiza	0.99			17	13,563	3,391	19,433
Metrovias -- Subte (Metro)	0.55			4	23,915	1,918	11,509
Brazil							
Supervia	1.00			28	11,235	18,418	110,508
Rio Metro	0.32			5	13,926	2,321	13,926
France							
	0.69	391	78	3,817	1,106	3,718	22,376
Germany							
	0.74	256	43	3,843	554	2,882	17,452
Bangladesh							
	0.13	259	102	1,704	71	3,074	20,424

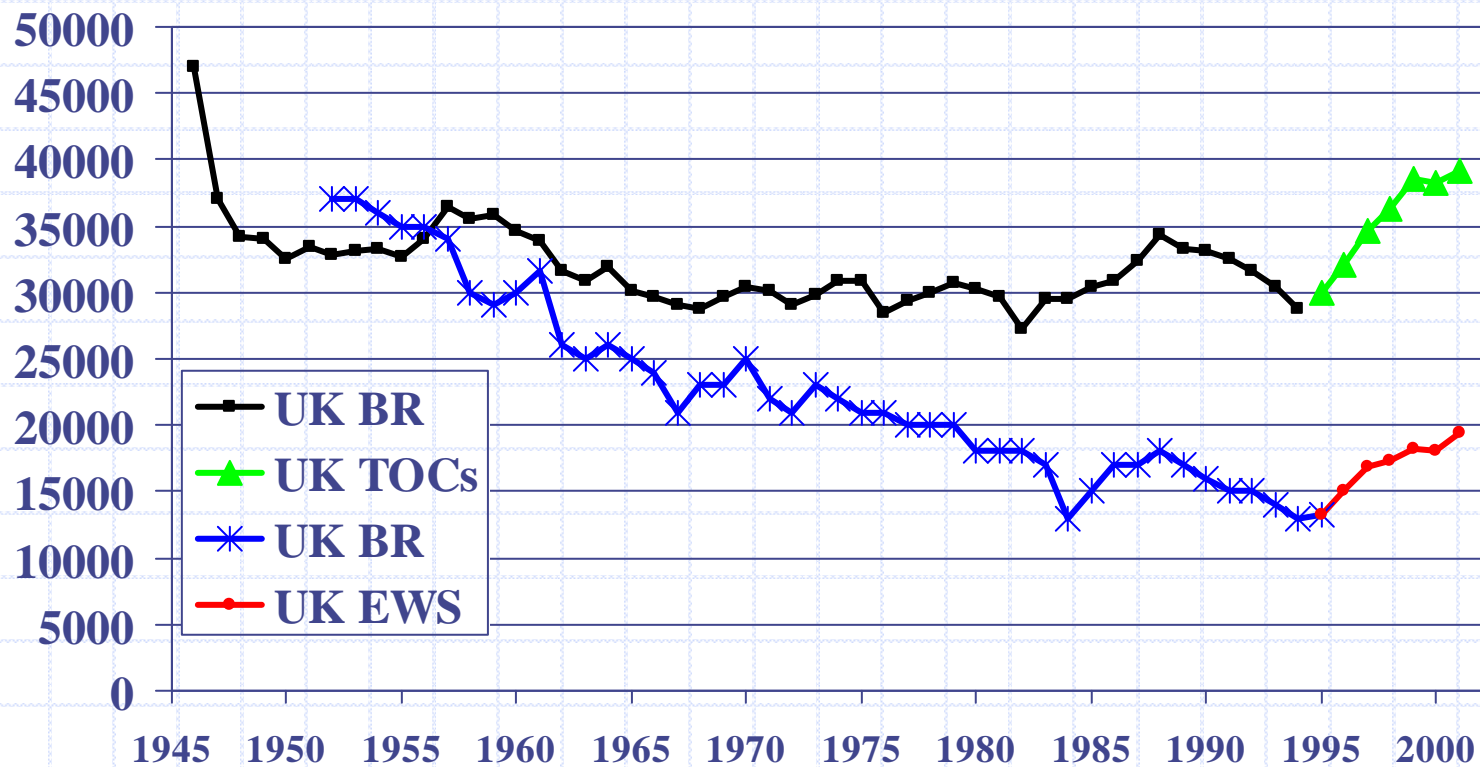
U.K. results

- ◆ Rapid demand growth
- ◆ Passenger-km highest since 1947
- ◆ Freight ton-km up 40 percent
- ◆ Primary problem with Railtrack management, secondary problem with unexpected growth versus Government policy
- ◆ Other problems with access charges and management of track contractors

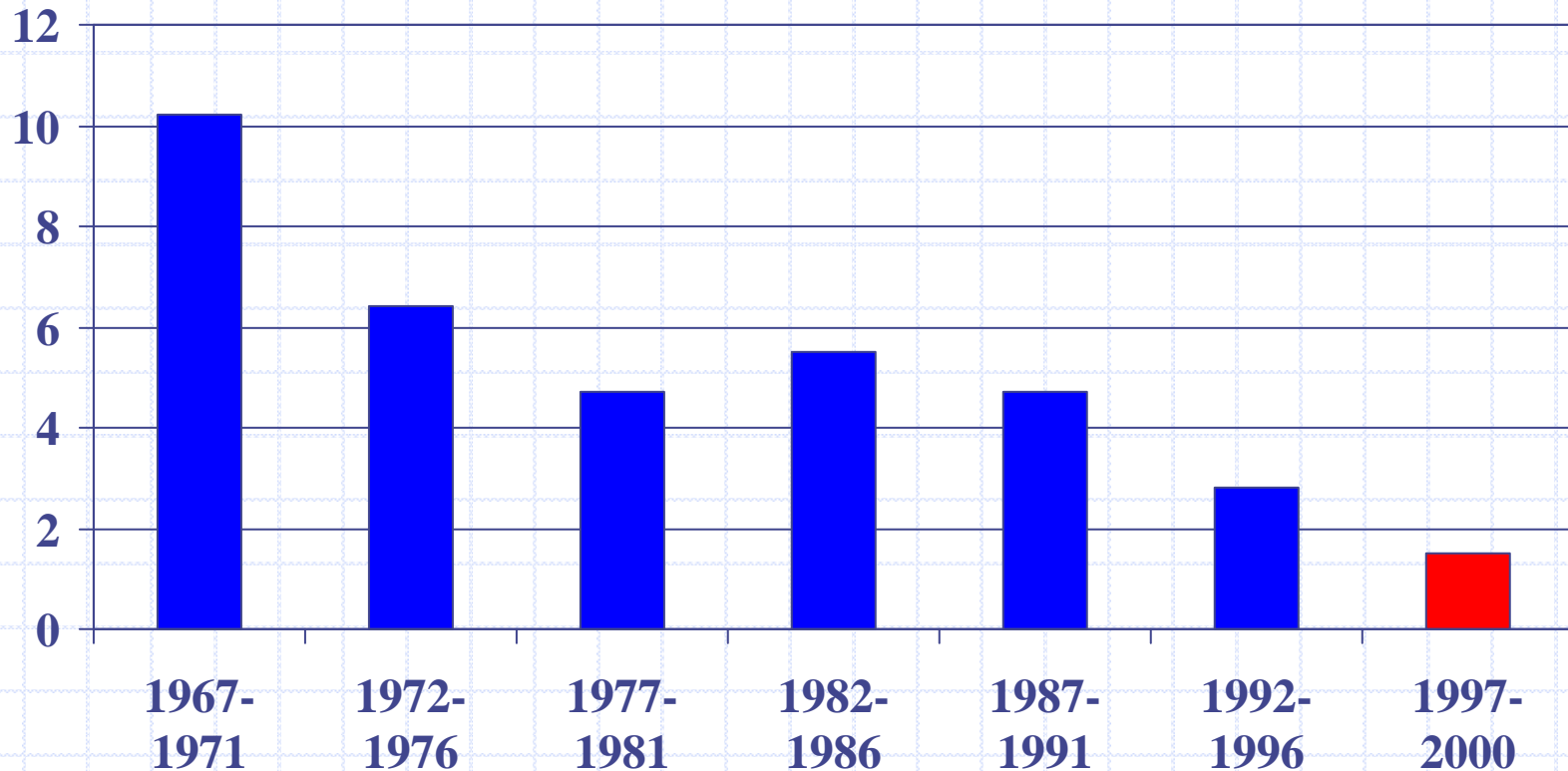
Rail Traffic in the U.K.

Figure 14

(000,000 passenger-km and ton-km)



U.K. fatal accidents per billion train-km since 1967



Note: series averaged over 5 year intervals to smooth year-to-year variation

Source: Andrew Evans, "Estimating Transport Fatality Risk From Past Accident Data", University College London, January, 2002