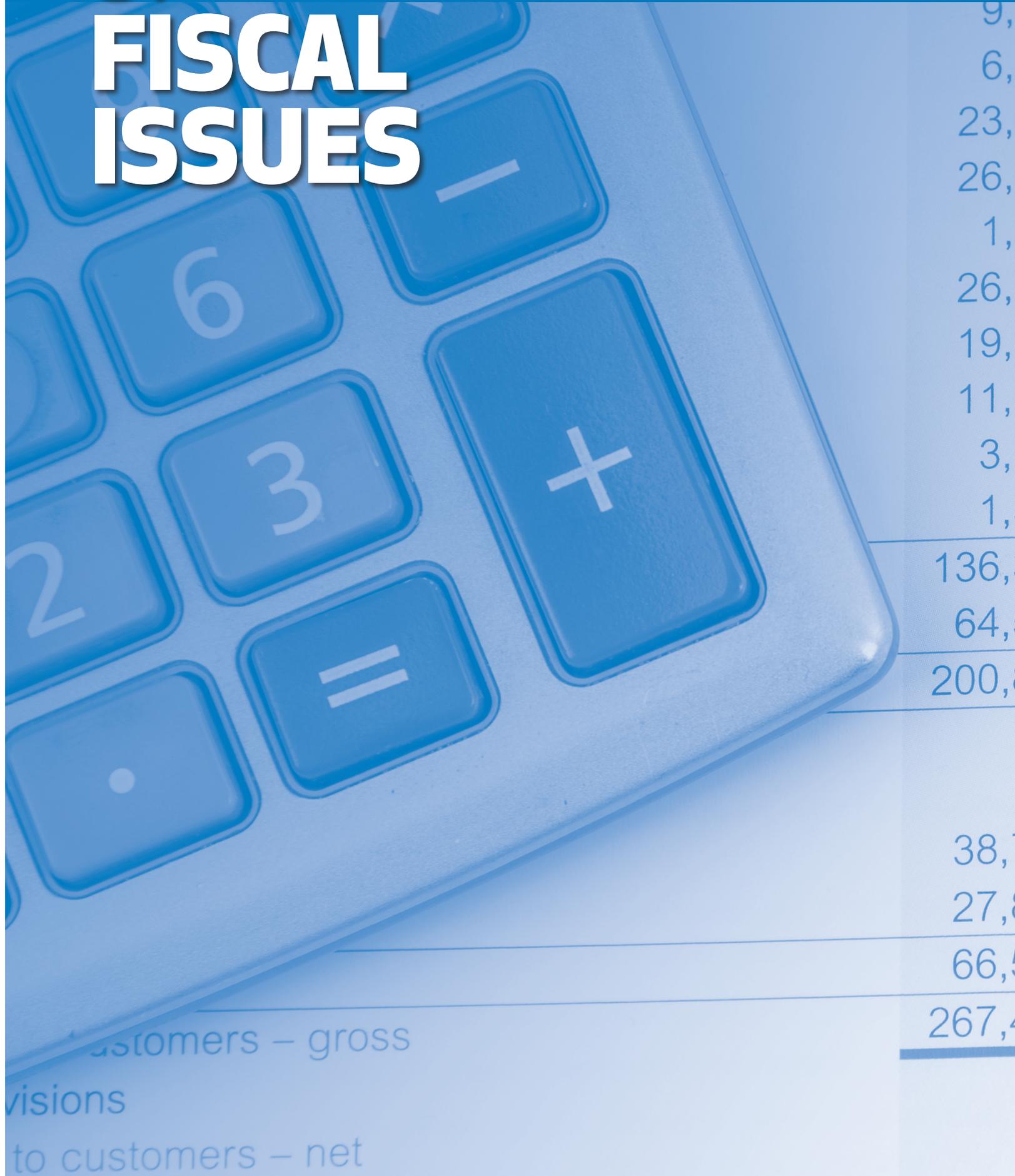


9. FISCAL ISSUES



768	582	784	8,251	7,274	5
271	1,037	943	25,017	27,091	24
522	938	557	43,887	40,687	30
603	8,446	8,838	2,767	2,645	2
275	542	950	39,296	32,899	20
767	6,559	5,970	70,884	65,286	5
542	2,055	49,287	27,922	26,323	2
537	3,783	12,602	14,218	13,909	1
175	4,410	6,633	1,497	1,250	
308	104	85	251,522	232,319	19
341	28,458	86,723	69,242	52,234	4
558	2,450	2,234	320,764	284,553	24
399	30,908	88,957			
706	20,481	32,979	92,166	90,606	7
332	10,266	19,798	896	45,951	3
538	30,747	52,777	62	136,557	10
437	61,655	141,734	4,113	421,110	35
			(3,884)	(3,884)	
			466,	417,226	34

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9.

FISCAL ISSUES

The objective of this chapter is to look into the current system of transport taxes and user charges as a part of transport pricing strategy in India. Transport pricing is a method of resource allocation through a collection of tools that affect the final price of transport services and thus influences the behaviour of users and transport service providers. It is commonly assumed that there is no such thing as the 'right' price; there are only optimal pricing strategies aimed at achieving specific objectives.

One of the major problems in setting optimal transport pricing is to decide on the right objective. For example, the optimal price for profit maximisation may differ from that required for maximising social welfare or facilitating sustainable development. Moreover, effectiveness of other public policies towards transport depends on transport pricing. This chapter aims to define rational transport pricing policies and address a range of issues related to taxation structure in Indian transport sectors.

Transport taxes and user charges are two major components of transport pricing policy. We distinguish tax from user charges in this context. However, in practice, this distinction is often blurred. Taxes are government-mandated payments which go to the public exchequer. User charges explicitly relate to the benefits derived from consuming the services provided by the transport infrastructure. For example, Road Tax (or Motor Vehicle Tax) is intended to generate revenue for the purpose of road infrastructure development and maintenance. It is more like a payment for using infrastructure and therefore, could be considered as a user charge. However, road tax is collected irrespective of whether a car owner is actually using the infrastructure. The revenue from road tax is added to the total tax pool of a state and not necessarily earmarked entirely for maintenance and development of road. Usually, the final price of transport service (fare/ freight rate) includes 1) cost of provision of the service including input taxes (tax on fuels, rolling stocks, etc) and user charges levied on transport service provider, 2) profit margin, 3) output/ service taxes (less subsidy). Conceptually, if we go by the definition of user charge, fare and freight charge may be implicitly considered as a user

charge. However, following the literature, we assume that the fare or the final price of transport service is different from user charges for using other types of transport infrastructure.

To provide firms and individuals with pricing signals that guide their behaviour in a more rational economic manner, taxes and user charges need to be rationalised. Without this, interventions to manage the transport sector efficiently will be less than fully successful. Without better pricing, many investments and subsidies may be wasted and confidence in the outcomes of a wide range of policies undermined.

Broadly there are five objectives of taxes and user charges:

GENERATION OF RESOURCES

Generation of internal resources for development and maintenance of transport infrastructure could be considered to be the main objective of transport taxes. Tax revenues have more fiscal flexibility as they can be spent on anything, whereas user charges are levied closer to the point of use of transport infrastructure and can be spent on maintenance of the infrastructure. In an economy with broader social objectives, it is difficult to tightly link revenues with user charges in each transport sector for the expenditure incurred on it. Tax revenue gives this flexibility. Inter-modal, inter-regional, and inter-group distribution of resources is the main consideration while preferring taxation over user charges in a particular mode.

Theoretically, pricing should internalise the whole spectrum of externalities. However, this may lead to a very complicated tax system. There is a trade-off between improving efficiency through an array of taxes and better compliance through a simplified tax structure.

Investment priorities are determined on larger socio-economic considerations. The economic viability of large-scale investment projects should be assessed by taking into account all the costs and benefits. The total cost of investment is not only the direct cost of capital but it also involves opportunity cost of capital. Taxes and user charges in transport sector should be set in such a way that the price of the services covers at least its marginal cost in short-run and recovers the opportunity cost in the long-run. While the need for cross-subsidisation is well recognised, there should not be any justification for general subsidy for transport.

It is well established in the literature that more inelastic the demand, the greater is the opportunity to impose taxes. However, in so doing, the government should ensure that the economically vulnerable sections of the society are not denied the service. Given this general consideration, taxation policies should be conducive to maximum generation of resources if huge investment demand in transport sector is to be financed. Otherwise, the fiscal authority has to compromise with other socially important spending like health and education.

ECONOMIC EFFICIENCY

The concept of economic efficiency is derived from the theory of welfare economics and it is related to efficiency in the allocation of resources. Inefficient resource allocation can be changed to better allocation such that someone is made better off without hurting others. An efficient allocation is one where no such reallocation is possible. Economic efficiency also implies minimum technological cost of providing the service. Many governments follow economic or allocative efficiency principles in transport pricing policy. Welfare economics postulates that social benefit is maximised and as a result economic efficiency achieved when prices are equated with marginal social cost. When price is set at marginal cost, the sum of producers' surplus and consumers' surplus are at their maxima. Traditional theory tells that such a condition exists in the long run under perfect competition when individual producers set their profit maximising price. However, any degree of monopoly power permits a firm to charge a price higher than marginal cost so that it can realise additional profit at the expense of reduced output. This, in turn, may lead to unfortunate circumstances

where some consumers are denied the use of the service. Indeed, it is the fear of monopolistic exploitation that has led to price regulation in transport sectors in many countries.

There is another source of inefficiency in transport pricing. If marginal private cost is different from marginal social cost due to negative externalities or marginal private benefit is different from marginal social benefit due to positive externalities, transport service providers may set prices at levels different from the 'first best' solution for society as a whole. Corrective fiscal measures may change the behaviour of service providers and consumers so that economic efficiency is achieved. Under this regime, full cost including social and environmental cost is accounted for in the price of transport services through proper taxation. For example, if there is negative externality in the transport sector and marginal private cost is lower than marginal social cost, government may impose a tax on output to equate private and social costs. Similarly, if the social benefit is higher than the private benefit, government may induce higher output through subsidies.

Theoretically, pricing should completely internalise the whole spectrum of externalities. However, this may lead to a very complicated tax system. As the tax structure becomes complex, the cost per unit of revenue collection increases. It also induces higher transaction cost. There is a trade-off between improving economic efficiency through an array of taxes and reduction in cost of revenue collection and better tax compliance through a simplified tax structure.

The conditions for the 'first-best' world are rarely found in reality. There are some other crucial conditions where fiscal policies play a welfare-improving role. Problems also arise when applying marginal cost pricing principle in transport because capacity is indivisible and can be increased only in large chunks. There are obvious economies of scale. Cyclicity in utilisation of infrastructure makes marginal cost pricing complicated. We summarise below the main reasons for fiscal intervention to achieve economic efficiency.

- a) Externalities (both positive and negative)
- b) Degree of monopoly
- c) Indivisibilities of supply and short-term fixed capacity constraints
- d) Indivisibilities of demand and short-term peak load problem

For some scarce resources, taxes play a role of shadow prices. For example, India follows the principle of import parity pricing of petroleum products. In this case, the taxes and margins added on top of the production cost ensures socially efficient use of this scarce resource.

Table 9.1
Transport Pricing Policy Objectives and Conflict

PRICING POLICY OBJECTIVES	CONFLICTS
Economic Efficiency vs Profitability	Pricing to promote the efficient use of transport capacity may lead to financial losses.
Environmental Sustainability vs Income Distribution	Pollution taxes may adversely affect poorer income groups and lead to unemployment
Profitability vs Macroeconomic Policy	Pricing for profitability may lead to higher transport prices thereby creating inflationary pressures
Profitability vs Income Distribution	Pricing for profitability may lead to higher transport prices with adverse effects on poor communities
Economic Efficiency vs Macroeconomic Policy	Macroeconomic price restraint policies may conflict with the need to increase transport prices during periods of congestion and excess demand

Source: Sustainable Transport Pricing and Charges: Principles and Issues, Asian Institute of Transport Development and UNESCAP, 2001

To sum up, it is important to recognise the importance of marginal cost pricing and internalisation of externalities in transport sector—correcting the price signals through taxes and user charges so that individuals (including transport service users, service providers and investors) guide their behaviour in a more rational economic manner.

INCOME DISTRIBUTION

The third rationale for taxation and user charges is the consideration of income distribution. Policy makers are usually concerned about the distribution of income. It is indeed true that optimal pricing strategy must look into the options of equity while keeping marginal conditions unchanged. Government should attempt to move towards a more progressive tax system in transport where tax incidence for people with lower ability-to-pay is lower. However, policies promoting redistribution are often coupled with ad-hoc interventions such as excessive price controls in the transport sector and consequent perpetuation of loss-making services. Cross-subsidisation involves charging some users above the marginal cost to offset the losses made on services where prices are fixed below the relevant marginal cost.

However, cross-subsidisation often violates the principle of progressive tax since it may not target the appropriate income groups effectively. The supply of the transport service is then often curtailed adversely, affecting the very people the policy is supposed to benefit. In general, cross-subsidisation should be eliminated in the interest of economic efficiency. If subsidy is socially desirable, it should be distributed through other general transfer mechanisms without distorting price signals. It is also argued that the efficiency gain from removing cross-subsidisation

may generate enough resources to compensate those who suffer from the undue burden. Therefore, it is important to identify the distributional implication of particular pricing policies and to modify them appropriately to achieve economic efficiency within the constraints of equity requirements.

ENVIRONMENTAL SUSTAINABILITY

Environmental protection has increasingly become an important policy objective in the transport sector. Transport, in general, and road transport in particular, contribute a large proportion of greenhouse gases which threaten environmental sustainability. Consequently, governments are increasingly introducing measures, including pricing tools such as pollution and congestion taxes, to control environmental pollution. Do such measures distort the pricing system? We have already emphasised the role of taxes in correcting price signals in the presence of negative externalities. Promoting environmental sustainability is consistent with the aim of welfare maximisation through economic efficiency where social welfare incorporates social environmental cost and benefit.

RELATIONSHIP WITH MACROECONOMIC POLICIES

Macroeconomic policies mainly target five interdependent variables: a) rate of growth of national output; b) level of employment; c) price or inflation; d) interest rate; and e) balance of payments (and therefore the exchange rate and capital flows). The level of investment in transport infrastructure and the transport pricing are interlinked with other macroeconomic policies. Investment in the transport sec-

Table 9.2
Important Taxes in Transport Sectors

NAME OF TAX	LEVYING AUTHORITY	IMPORTANT COMPONENTS	MODE
Taxes on Vehicles	State Governments	Receipts under the Indian Motor Vehicles Act, Receipts Under the State Motor Vehicles Taxation Act, Receipts Under State Toll Tax, Services and Service Fees, etc.	Roads
Taxes on Goods and Passengers	State Governments	Passenger Tax, Goods Tax, Tax on Entry of Goods into Local Areas, Tolls on Roads, etc. (nomenclature depends on state specific act)	Roads and Inland Water Ways
Other Taxes and duties on Commodities and Services	State Governments	Foreign Travel Tax (Tax on travel by Air, Tax on travel by Sea), Inland Air Travel Tax	Air, Water
Taxes on Sales, Trade, etc.	State Governments	State Sales Tax Act, Central Sales Tax Act, Tax on Sale of Motor Spirits and Lubricants	All modes, Fuels
Service Tax on Transport Services	Central Government	Air Travel Agent Services Tour Operator Services Goods Transport Operator Services Port Services Service on Repair Provided by Authorised Service Station for Motor Car and Two Wheeled Vehicles Cargo Handling Services Rail Travel Agent Services Airport Services Transports of Goods by Road Ship Management Services Transports of Coastal Goods and Goods through National Waterways	All modes
Excise	Central Government	Excise duty and cess on transport goods	All modes, Fuels
Customs	Central Government	Custom duty and cess on transport goods	All modes, Fuels

Source: NTDP Research.

tor affects aggregate output through the multiplier effect. It also generates employment and improves export competitiveness. Tax revenue collected from this sector is contributed to the consolidated pool and therefore gives greater fiscal flexibility. The prices of all other sectors are strongly linked with transport prices. Consequently, aggregate inflation may be contained through some of the fiscal instruments used in the transport sector. Macroeconomic policies, therefore, can impinge on transport pricing policies.

The set of objectives discussed above are often complex and conflicting. There is always a need for reconciling multiple objectives. For example, internalising diverse social costs associated with externalities through appropriate taxes and user charges may actually lead to an array of taxes. Similarly, reducing the complexity of tax structure through unified tax may fail to internalise diverse social costs associated with externalities but can have a significant impact on efficiency of tax collection. We may draw an analogy with tariff reforms in India during the early 1990s. A simpler tax system, especially in the road sector, may be beneficial for growth and efficiency

of road transport. While there are many transport pricing policy objectives, economists usually argue that the pursuance of economic efficiency should take precedence over other objectives. A summary of pricing policy objectives and conflicts arising therefrom are given in Table 9.1.

How does the current tax structure in transport meet the objectives discussed above? Does it fulfill the principle of marginal cost pricing and achieve economic efficiency? Lack of data restrains us from in-depth analysis of fiscal inefficiencies arising from the current tax structure. However, an attempt has been made to discuss some of the important issues related to the current tax system, especially in the road transport sector. Taxes and user charges on transport modes, and the way in which they are levied, have a profound effect on traffic flows and on the development of transport infrastructure. Before discussing the sources of fiscal inefficiencies, there is a need to review the prevailing tax structure. The following section gives a bird's eye view of all indirect taxes levied on transport sectors by mode (rail, road, aviation, ports and shipping) and levying authority (centre and state).

Table 9.3
Taxes Levied on Rail Transport

A. CENTRAL TAX:	
1) Excise Duty:	Excise duty is imposed on 1) Rolling stock, 2) Other equipments, and 3) Fuel (High Speed Diesel and Coal)
2) Custom Tariff:	Basic duty, CVD, Special CVD, education cess is imposed on rolling stock, other equipments and Fuel
3) Service Tax:	Rail travel agent services, Transport of goods by rail service are subject to service tax and education cess (education cess and higher/secondary education cess)
B. STATE TAX:	
1) Sales Tax/ Value Added Tax (VAT):	The state governments collect VAT/Sales tax on rolling stock, other equipments and diesel (HSD). The tax rate widely varies across states. Some states also charge entry tax on HSD (Karnataka, Oddisa), cess (Gujarat, Chandigarh, West Bengal), additional tax on VAT (Punjab, Haryana), Air Ambience Charge (Delhi), Social Security Cess (Kerala), etc. Electricity: State Electricity Duty (varies across states)

Source: NTDP Research.

THE SYSTEM OF TAXES AND USER CHARGES IN THE TRANSPORT SECTOR

The power of regulation and imposition of taxes on transport modes have been specified under the three lists vide the Seventh schedule (Article 246) of the Indian Constitution, viz. Union List, State List and Concurrent List.

Union List: Railways; National Highways; shipping and navigation on inland waterways; maritime shipping and navigation; lighthouses; major ports; airways, aircraft, and air navigation; provision of aerodromes; petroleum and petroleum products; customs; excise; and inter-state trade and commerce.

State List: Roads; bridges; ferries; other means of communication not specified in Union List; municipal tramways; inland waterways not specified in the Union or Concurrent Lists; taxes on entry of goods into a local area for consumption, use or sale therein; taxes on goods and passengers carried by roads or on inland waterways; taxes on vehicles; taxes on boats; and tolls.

Concurrent List: Non-major ports and parts of shipping and navigation on inland waterways subject to the provisions of the Union List with respect to national waterways.

The taxes are broadly classified as 'Central taxes' and 'State taxes'. The indirect taxes levied by the central government are excise, customs, and service taxes.

The state governments mainly collect sales tax/VAT, Motor Vehicle Tax (MVT) from road, and Passenger & Goods Tax (P>) from road and inland water transport. Table 9.2 summarises important taxes in the transport sector, levying authority and modes.

Though the central government is the levying authority for excise, customs and service taxes, a share of the tax revenues collected by the Union Government is distributed among states based on recommendations of the Finance Commission. Till the Ninth Finance Commission, only income tax and excise revenues were considered for sharing with states. After the Tenth Finance Commission (1995–2000), all taxes (except surcharges and cess) are now considered for devolution. The divisible pool includes other revenues including customs duty and service tax.

It is evident from Table 9.2 that the road sector is subject to multiple taxes at the state level. All other modes are mainly subject to the central taxes. Any variation in fuel price across regions is mainly due to the diverse state-level sales tax. We discuss the tax structure by mode below.

RAIL

The central government collects excise and customs on railway rolling stock, other equipment and fuels. Several services related to rail transport are also under the service tax net. The state governments levy VAT/sales tax on sales of rolling stock and other equipment. Electricity and fuel are also

Table 9.4
Taxes Levied on Road Transport

A. CENTRAL TAX:	
1) Excise Duty:	Excise duty is imposed on vehicles and parts. Motor vehicles for the transport of persons and goods are subject to varying rate on the basis of cylinder capacity, engine type, capacity, chassis, etc. Excise duty is a mixture of ad valorem and unit specific tax rates. Petrol/MS and HSD are subject to basic excise duty, Special Additional Duty, and Additional Excise duty.
2) Custom Tariff:	Motor vehicles for the transport of persons and goods are subject to varying basic duty (based on cylinder capacity, engine type, capacity, chassis, etc). CVD is also charged at the rate of excise duty. Education cess and secondary education cess are also collected.
3) Service Tax:	The following services in road transport sector are subject to service tax and education cess: Rent-a-Cab Scheme Operator Services, Tour Operator Services, Goods Transport Operator Services, Service on Repair Provided by Authorised Service Station for Motor Car and Two Wheeled Vehicles, Transports of Goods by Road, Travel Agents (other than Air Travel Agents)
B. STATE TAX:	
1) Taxes on Vehicles:	This tax is popularly known as Motor Vehicle Tax (MVT) or Road Tax. State governments generate revenue under Motor Vehicles Act, 1988 (regulation purpose), State Motor Vehicles Taxation Act (tax revenue purpose), state toll tax act, and different services and service fees. Some states have combined all these taxes and fees in a single tax scheme. This tax system varies across states and vehicle type. Some states collect onetime tax while several other states levy annual or quarterly tax.
2) Taxes on Goods and Passengers:	This tax is levied on goods and passengers carried by road or inland water way. Major components of this tax are tax on goods, passengers, entry of goods into local areas for consumption or final sale (popularly known as entry tax). Some states also collect tolls on roads under this nomenclature.
3) Taxes on Sales, Trade, etc.:	This tax group includes receipt under Central Sales Tax Act (states collect this tax), receipt under State Sales Tax Act (also known as VAT), Tax on Sale of Motor Spirits and Lubricants, and Surcharge on Sales Tax. The sales tax rate or VAT schedules vary across states.

Source: NTDP Research.

Table 9.5
Taxes Levied on Civil Aviation

A. CENTRAL TAX:	
1) Excise Duty:	Helicopters, aeroplanes, Aircraft launching gear; deck arrestors or similar gear; ground flying trainers; parts thereof are subject to central excise duty. Basic excise duty on Aviation Turbine Fuel (ATF) is 8 per cent. There is no additional excise duty.
2) Custom Tariff:	Helicopters, aeroplanes, propellers, air combat simulator, etc. are subject to custom duty and other trade restrictions are applied to these goods. CVD and Special CVD are applicable to private aircrafts. Basic custom duty on ATF is nil (ATF is domestically produced). However, CVD is levied on ATF (at the rate of excise).
3) Service Tax:	Air Travel Agent Services ¹ , Tour Operator Services, Cargo Handling Services, Airport Services, etc are taxed. The service tax on international air travel for passengers embarking in India and travelling in higher (other than economy) classes was imposed with effect from 1 May 2006. Vide Finance Act, 2010 the service tax on air travel was expanded to cover international and domestic travel in economy class ² .
B. STATE TAX:	
1) VAT/Sales Tax:	Fuel: State governments collect sales tax on Aviation Turbine Fuel (ATF). The rates vary across states substantially. VAT rate on ATF is as high as 28.75 per cent in Madhya Pradesh and lowest 0 per cent in Karnataka. Haryana imposes surcharge on ATF at 5 per cent. The average VAT rate is close to 20 per cent across states

Source: NTDP Research.

1. Route Navigation Facility, Landing and Parking, Terminal Navigational Landing, etc are important airport services. Airport Authority of India or private operators collect user charges for providing these services to airlines. These services are under service tax net.
2. Generally the break-up of the total air fare is the following. 1) base fare, 2) passenger service fee (marked as WO in ticket, collected by AAI or private operators), 3) airline fuel charge (collected by airlines), 4) service tax (marked as JN in ticket), and 5) development fee (marked as IN or YM in ticket, levied by airports). In addition to these, there may be transaction fee (marked as OC, collected by ticketing agent) and fuel surcharge (marked as YQ, collected by airlines).

Table 9.6
Taxes Levied on Shipping

A. CENTRAL TAX:	
1) Excise Duty:	Ferry-boats, cargo ships, barges and similar vessels for the transport of persons or goods are taxed at 5 per cent, vessels for fishery are not taxed. Fuel: as given in section on Road and Rail
2) Custom Tariff:	Cruise ships, excursion boats, ferryboats, cargo ships, barges and similar vessels for the transport of persons or goods are taxed. CVD (other than fishing vessels) and special CVD are applicable on top of the basic rate.
3) Service Tax:	Steamer Agent Services, Port Services, Cargo Handling Services, Dredging Services of River, Port, Harbour, Backwater or Estuary, Ship Management Services, Transport of Persons by Cruise Ship, Transports of Coastal Goods, etc are taxed
B. STATE TAX:	
1) VAT/Sales Tax:	Ships and other vessels are taxed Fuel oil is subject to sales tax as described in sections on Rail and Road.

Source: NTDP Research.

subject to state-level taxes. Table 9.3 summarises important taxes in rail transport by the levying authority.

ROAD

In addition to excise, customs and service tax levied by the central government and sales tax/ VAT levied by the state governments, there are several other taxes imposed on road transport at the state level. Taxes on Vehicles and Taxes on Goods and Passengers are two important categories of state-level taxes. There are several components of Taxes on Vehicles and Passenger and Goods Tax (P>). Motor Vehicle Tax (MVT—popularly known as Road Tax) is a major component of taxes on vehicle. Goods Tax, Passenger Tax, and Entry Tax are three important components of Taxes on Goods and Passengers. The road tax rates are diverse and complex in nature. The complexity of these taxes is discussed in greater detail in the next section. The VAT on fuels, levied by state governments, varies widely across states. Some states impose an additional tax on VAT, employment cess, air ambience charges, entry tax, and social security cess on fuel. Customs duty and excise tax are imposed by the central government and are, therefore, uniform across states. The taxes in road transport sector are summarised by levying authority in Table 9.4.

CIVIL AVIATION

The main tax levies on this sector come from sales tax or VAT levied on aviation turbine fuel (ATF). The sales tax rate varies across states. Domestic airlines spend around 35 to 40 per cent of operating costs on ATF while foreign airlines pay lower price for ATF

due to exemption from some tariffs. ATF is also subject to central excise. Although import of ATF is not allowed, import parity price of domestically produced ATF includes CVD. International flights (domestic and foreign operators) are exempted from state sales tax on ATF. A summary of taxes imposed on this sector is given in Table 9.5.

PORTS AND SHIPPING

Water transport comprises shipping services (coastal and ocean), inland waterways, and port services (major, intermediate, and minor ports). Other subsidiary services, viz. ship building and repairing, cargo handling, freight forwarding, lighthouse facilities, and other port services are also important inputs to this sector. Tariffs in the major ports are governed by the Tariff Authority of Major Ports (TAMP), whereas minor ports are under the state ambit. The Inland Waterways Authority of India regulates national waterways (there are five inland waterways). Indirect taxes in this sector are very similar to those in the civil aviation sector. The central government collects excise and customs tariffs from ships, boats and fuel. Service tax is also applicable to several services related to this sector. The state governments levy sales tax/ VAT on vessels and fuels. A summary of tax and user charges is given in Table 9.6.

USER CHARGES

In addition to taxes, user charges also constitute an important component of transport pricing. User charges, by definition, include a diverse range of payments for usage of transport services and infrastructure. Fare or freight charges may be seen as

Table 9.7
Important User Charges in Transport Sectors

NAME OF CHARGE	LEVYING/COLLECTION AUTHORITY	IMPORTANT COMPONENTS	MODE
Toll on National Highways	National Highway Authority of India, Private Operators (Public Private Partnership projects)	Toll charges on National Highways, Fees for use of permanent bridges, bypass or tunnel	Roads
User Charges in Major Ports	Major Ports (Port Trusts)	Port Dues Berth Hire Pilotage & Towage Wharfage Charges Demurrage Charges Anchorage Salvage & Divers Fees Dry Docking Water Supply to Vessels Licence Fee for Space	Water
User Charges in Airports	Airport Authority of India, Private Operators	Route Navigation Facility Charges Landing and Parking Charges Terminal Navigational Landing Charges	Air

Source: NTDP Research.

direct charges levied on the user. The fares are distinct from the user charges paid by transport service provider or passengers to the owner or operator of transport infrastructure.

Several explicit user charges on roads (toll), aviation (airport-related charges) and shipping services (port-related charges) are collected either from transport service providers or directly from traveller/transporter. Unlike port and airport services, there is no explicit user charge levied on usage of rail infrastructure by Indian Railways. However, private rail container operators do pay user charges to the railways. The way infrastructure is maintained and the tariff rates are regulated in railways is quite different from that in other modes. One important distinction is that there are separate authorities for operation of the infrastructure and regulation of the tariff structure in shipping and aviation sectors. For example, either the Airport Authority of India (AAI) or private entities operate the airport infrastructure whereas the Airports Economic Regulatory Authority (AERA) regulates the tariff structure. Similarly, port trusts operate shipping infrastructure whereas the Tariff Authority of Major Ports (TAMP) regulates the tariff structure in major ports.

In contrast, the Indian Railways is the sole owner and operator of the huge railway infrastructure and at the same time it also regulates the tariff structure. Freight and passenger tariff rates in rail transport do not explicitly mention any user charge levied on usage of railway infrastructure. However, tariff rates, in principle, may implicitly internalise the cost of depreciation of infrastructure. Indian Railways does not have a proper system of internalising the cost of depreciation of own infrastructure

through user charges. Though there is a Depreciation Reserve Fund of Indian Railways, the current reserve in this fund is very low and there is no clear revenue generation practice through user charges. As long as there is no internal system of payment for user charges, railways may not fully internalise the cost of depreciation of its own infrastructure. (Chapter on Railways for recommendations on reforms in Railways accounting).

Table 9.7 gives a summary of important user charges levied on transport modes.

Subsidy is an integral part of the transport pricing mechanism. Only a part of government subsidies is clearly visible in the central government's budget documents. Such explicit subsidies are mainly on food, fertiliser and petroleum. There is no explicit subsidy to transport sectors mentioned in the central government budget documents. However, Indian Railways receives subsidy towards dividend reliefs and other concessions, and reimbursement of losses to railways on operating strategic railway Lines. Under the 'Separation of Convention' the Railways are required to pay dividend at a fixed rate on capital advance by the central government. The rate of dividend is periodically revised by the Railway Convention Committee of Parliament. Railway receives, in principle, subsidy equivalent to the amount of dividend paid on investment in strategic lines, non-strategic portions of lines in north-eastern states, etc.

There are several forms of implicit subsidies in transport. According to the annual reports published by Indian Railways, there is cross-subsidisation from freight earning to passenger and other coaching earnings. Similarly, earnings of the state

Table 9.8
Complexity of Motor Vehicle Tax Structure

STATE	GOODS TRANSPORT			PASSENGER TRANSPORT			PERSONALISED TRANSPORT		
	Types of Vehicle	Number of Lines	Parameter	Types of Vehicle	Number of Lines	Parameter	Types of Vehicle	Number of Lines	Parameter
Andhra Pradesh	4	8	C,W,Q/L	3	8	R,E,C,K,Q,S	4	5	C,Q/L,O
Arunachal Pradesh	3	3	A	1	1	L	4	4	L
Assam	3	11	C,Q	1	4	C,Q/A,S	4	12	P,C,R,Q/L
Bihar	3	9	C,W,A	1	3	C,A	4	7	P,W,A/L
Chhattisgarh	4	9	C,W,Q/L,U	1	4	C,M,S,K	4	6	C,P,Q/L
Goa	1	17	C,W,A	1	5	C,M,A	4	11	C,W,PA/L,S
Gujarat	2	5	C,W,PA	2	10	C,A	4	6	C,PL
Haryana	1	5	C,W,A	2	4	C,A,R,I	4	7	C,W,A/L,I
Himachal Pradesh	3	5	A	1	2	C,A,R	5	7	L,H
Jammu and Kashmir	2	2	Q,U	1	1	C,Q	4	7	H,Q/L
Jharkhand	4	7	C,W,A	1	4	C,A	5	5	C,A/L
Karnataka	3	4	C,W,Q/L	1	8	C,Q,E,S,R	4	7	C,W,P,Q/L
Madhya Pradesh	1	10	C,W,Q/L	1	6	C,M,S	4	4	P,C,Q/L
Maharashtra	2	5	C,W,A/L	8	10	C,A,R,E	4	18	C,P,Q/L,S
Manipur	4	7	F,A	1	1	C,A	4	7	W,F,A
Meghalaya	5	10	C,W,A/L	2	3	C,A	4	4	L
Mizoram	4	6	C,A	1	1	C,A	4	4	A
Nagaland	4	8	C,A,U	1	5	C,R,A	4	11	W,H,R,L
Odisha	2	11	C,W,A,P	2	11	C,A,K,S	4	10	C,W,O,PA
Punjab	3	6	C,W,A,U	2	18	S,R,D/A,K	4	12	C,A/L,S

STATE	GOODS TRANSPORT			PASSENGER TRANSPORT			PERSONALISED TRANSPORT		
	Types of Vehicle	Number of Lines	Parameter	Types of Vehicle	Number of Lines	Parameter	Types of Vehicle	Number of Lines	Parameter
Rajasthan	3	16	P,L,U	2	35	C,D,P,B,T	2	9	C,H,PL
Sikkim	3	3	C,W,A/L	1	2	A	3	9	C,H,A/L
Tamil Nadu	4	23	C,W,Q/L	3	8	C,R,Q,S	4	5	P,S,A/L
Tripura	4	8	C,W,A	3	7	C,A	4	5	A
Uttar Pradesh	4	6	C,W,Q	1	1	C,Q	4	8	C,H,P,F,Q/L
Uttarakhand	4	8	C,Q,R	1	2	C,Q/M	4	5	H,P,C,Q/L
West Bengal	4	59	C,W,Q	1	1	C,Q	4	11	C,H,L
Andaman Nicobar	3	3	A	1	1	A	4	4	A
Chandigarh	3	7	C,A	1	2	A	4	13	C,A/L
Dadra and Nagar Haveli	3	3	C,W,A	1	1	C,A	4	8	C,W,A
Daman and Diu	2	3	C,W,F,A	1	3	C,A,K	4	13	C,W,H,A
Delhi	2	10	C,A	1	5	C,A	3	8	PL
Puducherry	2	9	W,Q	2	8	C,Q,R,S	4	13	C,W,H,S,Q,A

Source: NCAER report (NCAER 2012). Detailed tax rates are given in NCAER report.

Legends:
C: capacity
W: weight
P: price
A: annual
Q: quarterly
L: lifetime/ lumpsum

F: fuel type
R: regional
K: distance (km)
S: service
E: Earnings
M: monthly
I: institution

D: daily
B: body form i.e. whether chassis or vehicle
T: number of wheels/ tyres
O: ownership of second vehicle, age of vehicle,
H: cc (engine capacity)

owned transport corporations fall short of operating cost and receive some form of subsidies from state governments. Sometimes, they receive subsidised fuel as well. In the aviation sector, some economically unprofitable regional routes receive cross-subsidisation. In recent past, the ship-building industry has also received subsidies.

The above discussion on the current system of taxes brings forth an important finding: the tax system in road transport is much more complex compared to rail, civil aviation and shipping. While there are hardly any taxes imposed by the state governments on rail transport, the other two modes, aviation and shipping, face less tax complexity due to uniformity

in tax structure. Except fuel, these three transport modes are almost exempted from state-level taxes. On the other hand, the Road Tax and P> rates are very diverse and complex. In fact, one of the important sources of inefficiencies in the transport sector is the multiplicity and complexity of this tax structure resulting in several barriers to free movement of goods across state borders. Since road is the dominant mode of transport, any inefficiency in this sector gets multiplied through strong sectoral linkages. Why is the tax system in road transport so complex? Does MVT and P> comply with the objectives we discussed in the first section? These are the questions we try to address in the next section.

COMPLEXITY OF TAXES IN ROAD TRANSPORT

In addition to usual central taxes, Motor Vehicle Tax (MVT) and Passenger and Goods Tax (P>) are levied by the state governments in road transport. Broadly, there are two objectives of MVT. First, it can be justified as the approximate user charge for use of the road network. Second, MVT is used as a fast-growing base of tax revenue for states. Over time, it became an important revenue source of state governments. However, the complexity of this tax system has caused several impediments to smooth functioning of inter-state trade and commerce.

TAX COMPLEXITY

There are different bases for computation of tax rates across states. While the access charges vary according to vehicle type, they do not discriminate according to usage type. The current structure of MVT is only indirectly linked to usage of the road network. Moreover, the revenue generated from MVT is not necessarily earmarked entirely for road network development and maintenance. Therefore, it is not a perfect user charge. The MVT structure depends on the use of vehicle, i.e. whether it is a goods carrier, used in passenger transport, or as a personalised vehicle. Further, each of these three vehicle types includes a specified category of vehicles that are taxed differently. MVT, in its current form, is a form of registration charge on access to road network. In fact, the more distance a vehicle has travelled, the less the vehicle charge per kilometre.

The tax parameters are mainly capacity/ weight of the vehicle, fuel type, body type, engine capacity, distance travelled, ownership, cost of vehicle, etc. Tax could be paid quarterly, annually, or for life depending on state-specific rules. Some states also charge differentiated tax within regional limit. Each state has multiple lines of tax rates based on a combination of parameters for each broader group, i.e. passenger vehicle, goods vehicle and personalised vehicle. It is evident that as the tax lines increase, the tax structure gets complicated. Moreover, a varied combination of these parameters complicates and prevents formulation of a common benchmark for state-level comparison. Nevertheless, an effort has been made to summarise the extent of complexity of MVT across states based on number of tax lines, number of parameters, and types of vehicles. Wide variations in the MVT rates, not only across states, but also across vehicle types and further within are summarised in Table 9.8.

For any vehicle type, a low number of lines and parameters would indicate a simplified tax procedure whereas complexity is evident for states with higher number of lines and parameters. The tax procedures

appear to be the simplest in Delhi and Chandigarh (apart from smaller states and UTs) after taking into account the variety of decisive parameters in case of goods carrier. West Bengal appears to be executing an extremely complex structure as the state has got the maximum number of lines. With regard to passenger transport, Andhra Pradesh, West Bengal and Uttar Pradesh have the simplest structures whereas Punjab and Rajasthan implement a considerably varied tax structure across vehicles transporting passengers. Tax structure on personalised vehicles is most simple in Andhra Pradesh, whereas Maharashtra exhibits huge complexity due to high number of lines as well as parameters.

MVT, levied by states under their own motor vehicle taxation acts, is mainly for revenue purpose, whereas licence fees, registration fees, permit fees, etc. collected under Indian Motor Vehicles Act are for regulatory purpose of road transport. The revenue collected from registering motor vehicles, obtaining driving licences, transfer of ownership of motor vehicles, permit for transport vehicles, and certificate of fitness for transport constitute a significant portion of states' total tax revenue.

Thus, there are four main characteristics of the current Motor Vehicle Taxation System.

- a) Different classification principles of vehicles for the purpose of taxation across states
- b) Variation in duration of tax cycle across states- life time vs periodic
- c) Use of ad valorem vs specific rates
- d) Multiplicity of tax rates

All the above features result in serious problems of cross-classification and unintended economic effects.

Some states also impose tax on entry of goods into local areas for final consumption or sale; tolls on roads; passenger tax; and goods tax. All these taxes are classified as Taxes on Goods and Passengers in state budget documents. Some states also impose surcharge on tax on goods and passengers carried by road and inland waterways. At present, all the states do not levy entry tax. Also, it is not levied on all goods. Entry tax is levied through a separate statute in each state. There may be separate statutes for the levy of entry tax on motor vehicles and other speci-

The Motor Vehicle Tax can be justified as the approximate user charge for use of the road network. It is also used as a fast-growing base of tax revenue for states. However, the complexity of this tax system has hampered smooth functioning of inter-state commerce.

Table 9.9
Multiplicity of Laws and Taxes that Regulate Road Transport Sector

TYPE OF LAWS AND TAXES	IMPORTANT LAWS/TAXES
Laws governing access control to National Highways	<ul style="list-style-type: none"> i) National Highways Act, 1956 (ii) National Highways Rules, 1957 (iii) The National Highways Authority of India Act, 1988 (iv) National Highways (Land and Traffic) Act, 2002 (v) Highways Administration Rules, 2003.
Laws governing inter-state movement of goods	<ul style="list-style-type: none"> (i) Central Sales Tax Act, 1956 (ii) Various State Sales Acts / State VAT (iii) Various Local / Municipal Acts Governing Octroi and Entry Tax (iv) The Carriers Act, 1865 (regulating the liability of carriers)
Laws governing inter-state movement of vehicles	<ul style="list-style-type: none"> (i) The Motor Vehicle Act (MVA), 1988 (Amended in 1994, 2000, and 2001) (ii) The Central Motor Vehicle Rules (CMVR), 1989 (Amended in 1994, 2000, 2002, 2004, and 2005) (iii) Various State Motor Vehicles Acts.
Taxes	Road Tax, also known as Motor Vehicle Tax State VAT/Sales Tax Passengers and Goods Tax (P>) which includes Entry Tax State Toll Taxes Service Tax on output of this sector as well as secondary activities.
User Charges/Fees	Registration of motor vehicles Obtaining of driving licenses Transfer of ownership of motor vehicles Permit for transport vehicles Certificate of fitness for transport Tolls on roads and bridges

Source: NTDP Research.

fied goods. Local area, for this purpose, means an area falling within the jurisdiction of any municipal corporation, municipality, municipal body, cantonment board, gram panchayat, or any other local authority constituted under the statutes referred to in the law for levying entry tax. This tax is generally payable only at the point of first entry in the state, except in specific situations. In certain states, entry tax may be payable on movement from one local area to another.

Vehicles and their parts attract central excise, customs duty, and state sales tax. Basic customs duty on vehicles is around 10 per cent. CVD rate varies from 10.3 per cent to 22.6 per cent. A Special CVD of 4 per cent is also imposed on some vehicles and parts thereof. Central government collects excise duty at 22 per cent for passenger transport vehicles. There is additional specific tax of Rs 20,000 per unit for some types of vehicles. Excise duty varies from 10 per cent to 22 per cent for goods carrier. Sales tax / VAT for motor car vary from 12.5 per cent (Punjab, Maharashtra, Kerala, West Bengal, etc.) to 14.5 per cent (Andhra Pradesh). Inter-state transactions are subject to central sales tax of 2 per cent.

The Union Government also collects revenue from service tax on transport of goods by road, cargo handling service, tour operator's service and rent-a-cab

service. The standard service tax rate is 12.36 per cent including education cess.

TOLL AND CESS

There are two important other components of road pricing that need to be discussed: toll on National Highways and cess on petrol and diesel. Toll is an instrument used to control access to road. The toll, or user fee, on National Highways is levied and collected in accordance with the provisions of the National Highways Act, 1956 and rules made thereunder. User fee is charged on all sections of the National Highways having four or more lanes, bridges, and newly constructed bypasses. A ceiling for fee rate per kilometre for different types of vehicles has been prescribed for public-funded projects. Toll is charged in India under an 'open system' that imposes a fixed payable amount independent of the facility availed. This is in contrast to the 'closed system' approach in many other countries that charge tolls on the basis of the distance travelled. In the case of private investment projects, the collection of fee levied under the rule is made in accordance with the terms of the agreement entered into by the concessionaire.

The Government of India introduced a cess on both petrol and diesel through the Central Road Fund (CRF) Act, 2000. Currently, Rs 2 per litre is levied as cess or additional duty of excise and customs on

Table 9.10
State Tax Revenue From Road Transport
 [Rs Billion]

YEAR (MARCH ENDING)	MOTOR VEHICLE TAXES AND FEES	SALES TAX ON MOTOR SPIRITS AND LUBRICANTS	SALES TAX ON PASSENGER AND GOODS TRAFFIC	TOTAL STATE TAX FROM ROAD TRANSPORT (A)	TOTAL STATES' OWN TAX REVENUE
2003	84	51	36	171 (12.0)	1,421
2004	101	50	42	193 (12.1)	1,599
2005	108	67	52	227 (12.0)	1,891
2006	120	30	65	214 (10.1)	2,123
2007	132	13	68	214 (8.5)	2,525
2008	151	16	68	236 (8.2)	2,865
2009	164	9	85	259 (8.0)	3,219
2010	191	10	99	300 (8.3)	3,631
2011	244	7	113	364 (7.9)	4,607
Growth Rate (per cent)*	14.2	-21.9	15.5	9.9	15.8

Source: NTDP Research.

both petrol and high speed diesel (HSD) oil as per the provisions of the Act amended by the Finance Act in 2005. Parliament decided that the fund so collected should be put aside in a Central Road Fund (CRF) for exclusive utilisation towards the development of a modern road network.

To sum up, the tax structure is exceedingly complex in road transport, and has wide variations across states. It is difficult to compare tax rates among states due to the differential taxation structures and different classification principles for taxation of vehicles. Moreover, some states levy specific amount as tax on motor vehicles, whereas some others collect ad valorem tax. In some states, road tax is collected in lump sum as lifetime tax, whereas in other states, it is collected periodically.

Regulation and taxation of motor vehicles are two distinct powers under the Indian Constitution. While regulation is under the concurrent list, taxation of road transport is under the state list. Except for National Highways, state governments have the responsibility of construction and maintenance of roads. Both central and state governments impose taxes at different stages—on purchase, ownership, and use of vehicles as well as ‘services’ related to this sector. A summary of the multiplicity of laws and taxes in the road sector is given in Table 9.9.

3. Purohit and Purohit (2010).

While the multitude of taxes and user charges lead to severe complexities, it is difficult to ignore their increasing contribution to the public exchequer. Is it possible to rationalise the tax structure in the road sector in a revenue-neutral way? What is the significance of these taxes in states’ finances?

REVENUES FROM TAXES ON ROAD TRANSPORT

Revenue from MVT is one of the increasing sources of state’s own tax revenue. Though it was originally envisaged to be levied as a regulatory measure, over time it became an important revenue source. According to a report sponsored by the Planning Commission³, the revenue from MVT has increased at an annual rate of 14.6 per cent and exhibited a tax buoyancy of 1.05 during the period 1980-81 to 2007-08. Table 9.10 gives state tax revenue from road transport from 2002-03 to 2010-11. During the same period, revenue from MVT grew at a CAGR of 14.2 per cent, whereas revenue from Passenger and Goods Tax (P>) grew at 15.5 per cent. However, revenue from sales tax on motor spirit and lubricants declined annually at 21.9 per cent. The fall is particularly sharp between 2005 and 2006, with almost a consistent decline from thereon.

Table 9.11
Central Tax Revenues from Road Transport
 [Rs Billion]

YEAR (MARCH ENDING)	MOTOR VEHICLES AND ACCESSORIES		TYRES AND TUBES		HSD		MS		TOTAL CENTRAL TRANSPORT REVENUES (B)	STATE AND CENTRAL REVENUES C= B+(A) OF TABLE 10	TOTAL INDIRECT TAX OF CENTRAL GOVT
	Import Duty	Excise Duty	Import Duty	Excise Duty	Import Duty	Excise Duty	Import Duty	Excise Duty			
2003	12	53	..	14	46	58	..	116	300 (30.9)	471	969
2004	14	56	..	11	53	73	..	126	333 (30.2)	526	1,104
2005	19	68	..	14	67	79	..	138	385 (29.9)	612	1,289
2006	21	70	..	11	57	112	..	176	447 (29.9)	660	1,496
2007	32	68	..	12	71	126	..	183	492 (27.1)	706	1,814
2008	44	67	..	14	97	129	..	201	553 (26.6)	789	2,080
2009	49	44	..	9	67	130	..	211	509 (26.1)	768	1,952
2010	41	93	15	11	47	140	34	288	669 (36.2)	969	1,849
2011	65	87	26	9	159	185	87	268	886 (34.1)	1,250	2,594

Source: State Finances: A Study of Budgets (RBI), several years.
 * Annual growth rate between 2000-01 and 2010-11.
 † Shares in states' own tax revenues are given in parenthesis.

It is also important to emphasise that growth rates varies across states, especially between special and non-special category states. The share of revenue from road transport in total states' own tax revenue was 12.0 percent in 2002-03. The aggregate revenue from states' own taxes has increased annually at 15.8 per cent, whereas total revenue from road transport-related taxes has increased annually at 9.9 per cent during 2003-2011. As a consequence of sudden drop in sales tax revenue from motor spirit and lubricants since 2005-06, the share of revenue from road transport in total states' own tax revenue has dropped to 7.9 per cent in 2011 from 12.0 per cent in 2003.

The Central Government generates revenue from import duty and excise duty on motor vehicle and parts, tyre, tubes, and fuels. The figures are given in Table 9.11. Total revenue from excise and customs on road transport-related goods and fuel has increased

annually at 14.5 per cent during 2002-03 to 2010-11. During the same period, the share of this revenue in total net indirect tax revenue of the Central Government hovered in the range of 26 to 36 per cent, with the average being 31 per cent. Total revenue of states and central government from taxes on road transport were around Rs 470 billion in 2002-03 which have increased to about more than Rs 1200 billion by 2010-11 growing at a CAGR of 13.0 per cent.

REVENUE FROM SERVICE TAX

There are several services related to the road sector that are taxed. Some services like tour operator services, goods transport operator services (discontinued from 2005-06) and cargo handling services, do not necessarily fall under the classification of road transport. Therefore, considering aggregated revenue figures from service tax might not be useful. Table 9.12 gives the disaggregated figures of service tax revenue

Table 9.12
Service Tax Revenues from Road Transport
 [Rs Million]

SERVICE	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Rent A Cab Scheme Operator Services	110	150	290	530	680	1,260	2,180	2,610	2,370	2,890	3,580
Tour Operator Services	110	130	310	430	950	1,520	1,510	1,710	1,480	1,750	2,400
Goods Transport Operator Services		50	370	50							
Service or repair produce by authorized service station for motor car & two wheeled motor vehicle	170	510	790	1,480	1,570	2,200	2,420	2,820	2,650	3,170	4,510
Cargo handling (only inland cargo)	-	100	390	950	1,690	3,290	3,790	4,450	4,840	5,340	6,290
Transport of goods by road	-	-	-	1,910 ⁴	14,090	24,820	28,340	32,080	26,280	30,280	33,860
Travel agent	-	-	-	30	60	100	120	120	110	190	200
Total	390	940	2,150	5,380	19,040	33,190	38,360	43,790	37,730	43,620	50,840

Source: Finance Accounts, Union Government, Controller General of Accounts, Ministry of Finance.

from road transport-related services from 2001-02 to 2011-12. Over time, new services were introduced under the service tax net. As a result, tax revenue from the road sector has increased rapidly between 2001-02 and 2011-12. The largest share comes from transport of goods by road (around 66 per cent⁴).

REVENUE FROM TOLL AND CESS

In addition to taxes, toll and cess contribute significantly to the public exchequer. However, as mentioned earlier, these instruments have less fiscal flexibility to meet the resource mobilisation objective. Total toll revenue from National Highways was Rs 44 billion in 2009-10 and that increased to Rs 80 billion in 2011-12 (Table 9.13)⁵. There is increasing emphasis on PPP projects in the road sector. The construction and expansion of projects under National Highways Development Project (NHDP) Phase III and onwards is undertaken on PPP basis with build, operate and transfer (BOT) as the preferred mode to mobilise

resources for infrastructure development. Share of toll revenues from publicly funded projects (including operate, maintain and transfer projects) was 37 per cent in 2009-10. The share was down to 25 per cent in 2011-12.

The fuel cess is collected by the Ministry of Finance. The revenue from cess on HSD and Petrol has increased from Rs 113 billion in 2005-06 to Rs 184 billion in 2011-12 (more than 60 per cent increase in six years). Total collection from the cess is given in Table 9.14.

The collection on this account is credited to the Consolidated Fund of India and thereafter Parliament, by appropriation, credits such proceeds after adjusting the cost of collection to the Central Road Fund (CRF). The CRF is distributed by the Planning Commission amongst the three Ministries of Rural Development, Railways, and Road Transport and Highways in the manner prescribed under Section

4. The percentage figure is based on aggregation of all the services listed in the table. As already mentioned, there are several services that span across modes.

5. The service tax on transport of goods by road was introduced on 01.01.2005. This is the reason for this low figure.

Table 9.13
Toll Revenue from National Highways
 [Rs Billion]

CATEGORY	2009-10	2010-11	2011-12
Public Funded Stretches +OMT	16	19	20
BOT Stretches (revenue share to NHA/premium)	3	5	9
BOT Stretches (Concession accrues to the Concessionaire)	25	35	51
Total	44	59	80

Source: National Transport Development Policy Committee, Planning Commission
 Note: OMT: Operate, Maintain & Transfer; BOT: Build, Operate & Transfer

10 (viii) of the Central Road Fund Act, 2000. The central government is responsible for development and maintenance of the National Highways. The Ministry of Road Transport and Highways takes care of the development and maintenance work of National Highways through three agencies, viz. National Highways Authority of India (NHAI), state public works departments (PWDs) and Border Road Organisation (BRO). The state roads and major district and rural roads fall under the responsibility of the respective state governments. These are developed and maintained by various state agencies. However, as already mentioned, some funds are also being provided by the Union Government from CRF for the development of state roads. There are two important schemes under which the state governments receive funds from CRF: (a) to develop state roads (other than rural roads, and (b) to develop interstate connectivity. These schemes are called Improvement of State Roads from the CRF and Economic Importance and Interstate Connectivity Scheme, respectively. To illustrate, an allocation of Rs 167 billion was made under CRF in 2009-10, the break-up of which is given in Table 9.15.

TOTAL RESOURCES GENERATED FROM ROAD TRANSPORT

The total resources generated from indirect taxes, cess and toll from road transport sector is around Rs 1,523 billion in 2010-11 which is around 1.95 per cent of GDP (Table 9.16). It was Rs 1,216 billion in the previous year.

Generation of economic resources is one of the important rationales for taxes in the transport sector. The above discussion has highlighted the importance of the revenue-generating role of vehicle tax, passenger and goods tax and user charges in states'

finances. However, most of the state-level taxes are ad-hoc in nature and do not necessarily follow the principle of economic efficiency. There are two main explanations for that. First, there is no comprehensive study to assess and fix the tax rates on the marginal cost-benefit principle of transport pricing. Second, the multiplicity and complexity of taxes impose transaction costs and several other hurdles for inter-state movement of cargo. In the next section, we discuss the sources of fiscal inefficiencies in road transport sector.

SOURCES OF FISCAL INEFFICIENCIES

Fiscal inefficiencies in transport sectors may arise due to several reasons. First, in a federal structure, the lack of coordination between tax-levying authorities may lead to huge transaction costs. For example, lack of state-level coordination in granting permits causes difficulties for private operators. The interstate movement of cargo and passengers is delayed due to long waiting times for paper work at state borders. Second, taxes on motor vehicles, goods and passengers vary across states substantially. Not only that, the way that tax is being collected has a significant impact on overall efficiency. Some states use simplified tax slabs and less complicated parameters for tax rates. In other states, the rate not only differs across types of vehicle, it also differs by capacity, axle type, and fuel type. Some states simplified the tax collection by imposing one-time tax. Third, tax rates are not necessarily set at optimal levels that fully reflect social costs due to negative externalities. Generally, externalities depend on type of fuel, carrying capacity, engine type, usage of infrastructure, time of traffic movement, etc. However, multiple tax lines create complications and cost of tax collection increases. It may also increase probability of tax eva-

Table 9.14
Funds Collected from Cess on High Speed Diesel and Petrol in India
 [Rs Billion]

YEAR	AMOUNT COLLECTED
2005-06	113
2006-07	122
2007-08	133
2008-09	152
2009-10	166
2010-11	170
2011-12	184

Source: Lok Sabha Unstarred Question No. 1707, dated 10 December 2008.
 Rajya Sabha Unstarred Question No. 1810, dated on 8 December 2011 and Rajya Sabha Unstarred Question No. 4458, dated 7 May 2013

Table 9.15
Allocation of Central Road Fund in 2009-10
 [Rs Billion]

ALLOTTEE	AMOUNT
National Highways	86
Rural Roads	48
Railways	10
Grant to State Governments and UTs for State roads	21
Grant to States & UTs for Roads of Inter-State Connectivity and Economic Importance	2
Total	167

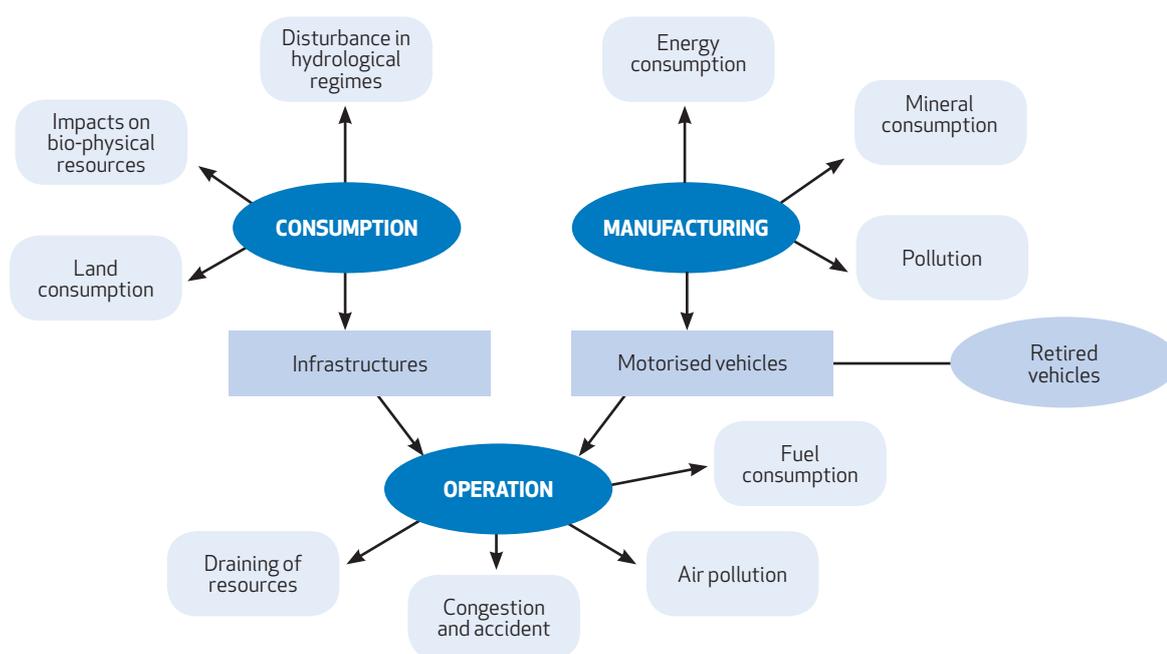
Source: NCAER Report (NCAER, 2012).

Table 9.16
Total Revenue Generation from Road Sector
 [Rs Billion]

PARTICULARS	2010	2011
Total State and Central Road Tax Revenues	969	1,250
Service Tax Revenue from Road Transport	38	44
Toll Revenue from National Highways	44	60
Revenue from Cess on High Speed Diesel and Petrol	166	170
Total Revenue Generation from Road	1,216	1,523
GDP at Current Market Price	64,778	77,953
As a Per cent of GDP	1.88	1.95

Source: Planning Commission.

Figure 9.1
Environmental Impacts of the Transportation System



Source: Environmental and Social Sustainability of Transport: Comparative Study of Rail and Road, Asian Institute of Transport Development, 2002

Table 9.17
Important Environmental Effects of Transport Modes

MODES	AIR	WATER RESOURCES	LAND RESOURCES	SOLID WASTE	NOISE	RISK OF ACCIDENT	OTHER IMPACTS
Road	Air pollution (CO, HC, NO _x , particulates such as lead), global pollution (CO ₂ , CFCs)	Modification of water systems by road building; pollution of surface and ground water by surface run-off	Land taken for infrastructure; extraction of road building materials	Abandoned facilities and rubble from road works; road vehicles withdrawn from service; waste oil	Noise around highways	Deaths, injuries & property damage due to road accidents; risk from transport of hazardous goods	Partition or destruction of neighbourhoods, farmland and wildlife habitats; congestion
Air	Air pollution, greenhouse & ozone depletion effects at higher altitudes due to NO _x emissions	Modification of water tables, river courses and field drainage in airport construction	Land taken for infrastructure; dereliction of obsolete facilities	Abandoned facilities and aircraft withdrawn from service	Noise around airports	Deaths, injuries & property damage due to aircraft accidents	
Water Transport	Discharge of ballast water, oil spills, etc.; modifications of water systems during port construction & canal cutting and dredging	Land taken for infrastructure; dereliction of obsolete port facilities & canals	Abandoned and laid-up vessels and craft	Bulk transport of fuels and hazardous substances			
Rail	Air pollution in populated areas; global pollution from thermal generating stations for electric traction		Land taken for right-of-way and terminals; dereliction of obsolete facilities	Abandoned lines, equipment and rolling stock	Noise and vibration around terminals and railway lines	Derailment or collision of trains carrying hazardous substances	Partition or destruction of neighbourhoods, farmland and wildlife habitats

Source: Sustainable Transport Pricing and Charges: Principles and Issues, Asian Institute of Transport Development and UNESCAP, 2001

sion. Major obstacles to interstate movement arise from transaction costs which reduce and sometimes may completely eliminate the benefit of differentiated taxing systems across states. It is observed that vehicle owners often change the address of vehicle registration to other states where tax rates are lower. Similarly, Indian ship owners are increasingly registering their ships in other tax-friendly countries.

We, however, are not in a position to quantify the loss due to obstacles at state borders (systemic obstruction that may cause slower movement of freight in India). There is a need to undertake a study to identify and quantify transaction costs caused by multiplicity of tax systems and non-harmonised regulations.

A typical carrier has to face a number of regulatory agencies when moving goods across regions: sales tax authorities, regional transport offices (RTOs), excise, forest department, regulated market committee, civil supplies (check on the movement of essential commodities, black marketing, weights and measures, food adulteration), and mining department. Clearly, all issues are not fiscal. Transporters have to face multiple detentions resulting in lower speed, loss of time, higher transaction costs, more fuel consumption, etc. All these lead to underutilisation of vehicle capacity and adversely affect operational viability. It is often argued that the road transport sector, due to these reasons, faces unequal competition from freight/cargo transport by rail, despite the fact that it has been gaining traffic share from the railways for a long time. Moreover, it causes wider economic costs which are difficult to assess.

The consequences of distortionary pricing policy are revenue loss due to tax evasion, higher expenditure on regulation and tax collection, transaction costs due to complicated tax systems, environmental damage, etc. As a result, insufficient revenue is generated for infrastructure development and maintenance. In recent years, government increasingly depends on private partnership in infrastructure projects. However, the private players may not necessarily maximise net social benefit and consequently a conflict arises.

The key questions concerning tax efficiency in the transport sector are the following:

- whether transport charges internalise marginal social costs
- whether transport sectors are subject to the same level of taxes on factors - labour and capital - in comparison with other sectors (direct taxes are beyond the purview of our analysis)
- whether transport charges on different modes are levied on the same basis
- whether subsidies in transport sector are justified under increasing returns to scale and if net charges cover fixed cost and

part of marginal cost

- whether redistribution through cross-subsidisation serves its purpose by properly targeting intended recipients
- whether domestic and foreign operators pay same level of transport taxes across states

We are not in a position to investigate these sources of inefficiencies due to data limitations. Later in the chapter, in order to gauge the wedge of inefficiency, we have attempted to capture some elements of differences in the delivery of transport services across a group of countries. The countries selected for such comparison are a mix of some developed and some developing countries.

The inefficiency due to complexity in tax structure is one of the reasons behind the tariff reforms in India. Instead of multiple tariff lines and product-specific rates, India gradually moved to simplified tariff lines. Similarly, recent sales tax reform has introduced uniform three to four schedules of VAT rates. A transparent and uniform tax system across states is one step forward towards a common market in India.

Thus, while the current tax structure in the road transport sector may achieve the revenue-generating goal for the states, it creates a big challenge to policy makers for moving towards a common market in India. The objective of environmental sustainability through a proper pricing mechanism is also an important challenge. How does the Indian transport sector cause negative externalities in terms of immediate health hazards, and long-term environmental damage through greenhouse gases? Is there any role of fiscal instruments to correct pricing signals?

ENVIRONMENTAL COST OF TRANSPORT AND CORRECTIVE FISCAL MEASURES

As has been discussed earlier, if pricing does not internalise the social cost due to negative externalities, there are serious problems in allocation of resources and overall economic welfare of the society. There are several external costs relating to the damage to human health on account of transport, especially road transport. It may be caused by noxious pollution, noise pollution, congestion, climate change, etc. Some effects are immediate, while others may be observed in the longer term. Figure 9.1 and Table 9.17 give a summary of negative externalities of transport modes both at systems and modal levels.

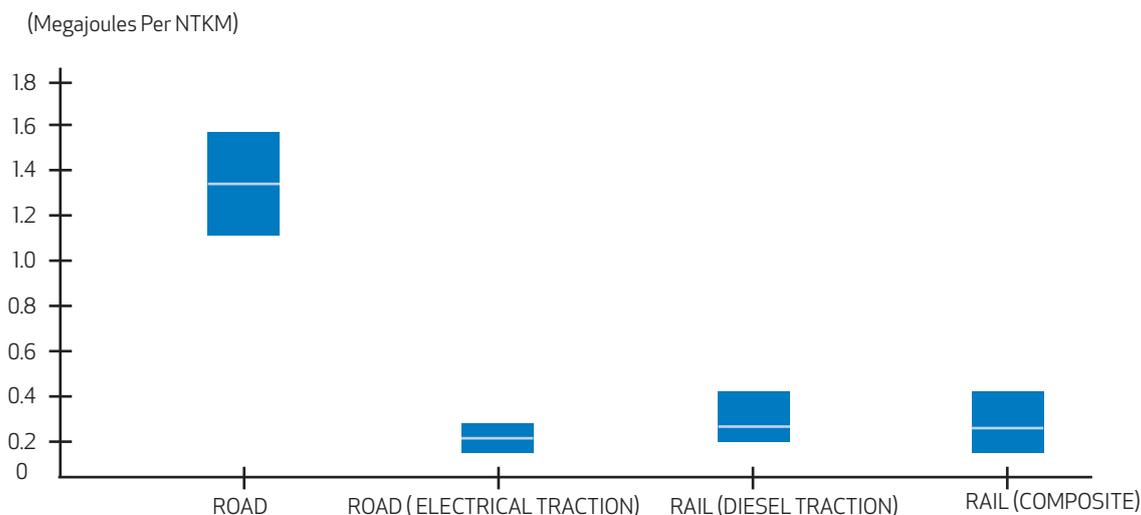
Though there is a high degree of uncertainty in estimating the correct monetary value of environmental cost in the transport sector, all studies indicate substantially high cost of damage to health. An early study 'Environmental and Social Sustainability of

Table 9.18
Environment Cost Per Tonne-Km for Road and Rail
 [Rs]

MODE	COST
Road (Freight)	0.202
Rail (Diesel Traction)	0.051
Rail (Electric Traction)	0.015
Airways	0.690
Coastal Shipping	0.030

Source: Total Transport System Study by RITES (2007-08).

Figure 9.2
Energy Consumption Ranges in Freight Transport



Source: Environmental and Social Sustainability of Transport; Comparative Study of Rail and Road, Asian Institute of Transport Development, 2002.

Transport' conducted by Asian Institute of Transport Development (AITD) in 2002 indicates that health damage cost of rail is generally lower than that of road. In urban areas for freight traffic, it is lower by as much as 76 paise per NTKM, while for passengers, it is lower by 10 paise per PKM. Moreover, substitution of passenger traffic on road by rail with diesel traction would result in substantial savings in health damage cost per day.

A study entitled Total Transport System Study (TTSS) by RITES made an assessment of the environ-

ment cost based on another previous study, 'Estimating Cost of Air Pollution Abatement for Road Transport in India: Case Studies of Andhra Pradesh and Himachal Pradesh' conducted by Institute of Economic Growth in 2005. The cost to the environment was treated as the cost of abatement, comprising cost of upgrading vehicle technology to meet higher emission norms and cost of improving fuel quality. The study drew on the data and findings from various studies such as emission level by different modes from Central Pollution Control Board (CPCB), social cost from Environmental and Social Sustainability

Table 9.19
Comparison of Co₂ Emission Between Rail and Road

		RAIL (SINGLE LINE)	ROAD (4 LANES WITH SERVICE ROAD)
Embodied energy (TJ/km)	Construction	12	39
	Maintenance	20	28
Embodied CO ₂ emission (T/km)	Construction	1,294	3,442
	Maintenance	1,892	1,073

Source: Total Transport System Study by RITES (2007-08).

Study of Transport by AITD, cost of improvement of fuel quality from the Mashelkar Committee, 2002. On the basis of analysis, the environment cost per tonne-km for road freight sector was determined as Rs 0.202. The cost for rail, airways and coastal sector was arrived at in proportion to fuel consumption under each of these sectors. A fuel consumption norm of 2.54 litres/'000 GTKM under rail, 0.00216 litres/tkm under coastal sector and 4.8 litre/100 kms for Airways was adopted. The environment cost adopted in the study under different modes is shown in Table 9.18.

The environment cost is assessed as Rs 0.051 per tonne-km for diesel rail traction while it is Rs 0.015 per tonne-km for electric-powered rail traction. The cost for coastal shipping has been determined as Rs 0.030 per tonne-km while for Airways it is found much higher at Rs 0.690 per tonne-km. Clearly, rail and coastal shipping have greater social cost advantage in freight movement. If the objective is to minimise the environmental cost and enhance sustainability, there is a clear case for shifting towards rail while also encouraging coastal shipping. With significant variation of external cost across modes and comparative cost advantage in some modes, the overall social cost of transport depends on an optimal mix of modes. A survey carried out among transporters in India suggests that the quality of service matters most in determining choice of transport mode⁶.

A comparative study of relative energy consumption for equivalent volumes of traffic on rail and road modes for both passenger and freight traffic, conducted by AITD in the year 2002 revealed that rail consumes much less energy than road

transport and has maximum advantage in respect of freight traffic. Figure 9.2 illustrates energy consumption (MJ/NTKM) between road and rail freight transport.

A study⁷ on life cycle energy and CO₂ emissions impacts of transport mode in India by TERI (2012) suggests that understanding of the full-life cycle energy and CO₂ impacts of transport modes can help choose better inter-modal shifts that are least energy and carbon-intensive throughout their lives. It also helps promote intra-modal shift towards more 'greening' by changing share of various components that contribute to energy consumption and CO₂ emissions. Rail (single line) has around 12 TJ/km of embodied energy for construction and 20 TJ/km for maintenance (Table 9.19). Whereas, highways (four-lane with service road) has 39 TJ/km and 28 TJ/km of embodied energy in construction and maintenance respectively. When we compare same modes for their embodied CO₂ emissions, rail releases around 1,294 T/km and highway releases 3,442 T/km during construction phase. The corresponding figures for maintenance phase are 1,892 T/km and 1,073 T/km respectively. Apart from applying different scientific mitigating measures, fiscal instruments may play a vital complementary role.

Transport policy directed towards internalisation of externalities in each mode can effectively improve the sustainability. As a quasi-public good, transport network should be priced for the use of its services for both passenger and freight traffic. We have already explained the rationale behind taxation and user charges for equity and efficiency considerations. We described the major taxes – taxes on vehicle, taxes on goods and passengers and taxes on fuels

6. Dey Chaudhury (2005).

7. Life cycle analysis of transport modes, prepared for National Transport Development Policy Committee (NTDPC) by The Energy Resources Institute (2012).

Box 9.1

Sustainable Pricing in Transport Sector

- Sustainable development should be promoted to the extent possible through transport prices that are equated with marginal social cost. The scarcity value of the natural resources used in the provision of transport infrastructure and services and the external costs due to pollution and degradation of the environment (that is, the social cost of transport), should be built into the price of providing or using transport facilities and services. Optimal pricing must balance economic efficiency, equity and transaction costs.
- The internalization of externalities is a fundamental requirement in devising transport pricing policies to promote sustainable development. Transport generates many negative externalities or external costs, including noise, accidents, pollution and congestion. If the externality costs are not borne by those who generate them, then the market mechanism fails to allocate resources efficiently. The 'polluter pays' principle suggests that users should be made aware of the external costs they generate by imposing on them pollution tax equal to the marginal environmental cost. This would also reduce the volume of transport activity to the socially optimal level.
- A sustainable transport policy will require intervention in the market system to ensure that:
 - the direct or indirect use of natural resources is such that they can at least be replaced by (a) their natural regeneration (e.g. hydroelectric energy for electric traction), or (b) discovery of new deposits of the currently used exhaustible resource (e.g. oil or natural gas reserves), or (c) the use of a new renewable resource (e.g. wind or solar power), or (d) conserving the use of resources per unit of transport output, or (e) a combination of these; and
 - the damage to the environment is within such limits that the productivity of other economic activities and the quality of life, in terms of health and security against accidents, do not deteriorate over time.

Source: Sustainable Transport Pricing and Charges: Principles and Issues, Asian Institute of Transport Development and UNESCAP, 2001.

and lubricants. None of these three types of taxes can be considered as representing charges related to the extent of usage of physical infrastructure and environmental damage. Gradually, highways are brought under the toll network which helps to internalise depreciation cost of infrastructure. It is a user cost in its true sense. However, India needs to develop an effective transport pricing policy, especially in urban transport, for environmental sustainability. We should also keep in mind that unnecessary complication in the tax system due to multiple environmental taxes may once again induce efficiency loss for reasons mentioned above.

It is an enormous task to assess the current tax system in terms of its effectiveness of achieving economic efficiency, environmental sustainability and resource generation – the three important rationales discussed in the first section. What is the extent of welfare loss due to economic inefficiencies under the current tax regime? The biggest hurdle we face in addressing these issues is limited data. As a result, it is almost impossible to disentangle the effect of fiscal inefficiency from all other inefficiencies in the sector. However, as a confidence-building exercise, we use a general equilibrium framework to answer

whether welfare-improving reform in transport tax structure is possible given strong sectoral linkages in the economy.

MODELLING RESULTS

The differential multiple tax regime across sectors of production leads to distortions in allocation of resources, thus introducing inefficiencies in the sectors of domestic production. The Thirteenth Finance Commission Report has recommended moving over from a complex tax structure at central and state levels to a comprehensive and simplified Goods and Services Tax (GST) regime that would facilitate efficiency in transport sectors. A recent NCAER study has analysed the impact of introducing GST on economic growth and international trade; changes in rewards to the factors of production; and the impact on output, prices, capital, employment, efficiency and international trade at the sectoral level⁸. GST would lead to efficient allocation of factors of production. The overall price level would go down. It is expected that the real returns to the factors of production would go up. The present study looks at distortions in the tax structure with regard to trans-

8. NCAER (2009).

Table 9.20
Cross-Country Comparison of Transport Efficiency

COUNTRY	TAX INTENSITY OF TPT OUTPUT	TPT INTENSITY OF OVERALL OUTPUT	ENERGY INTENSITY OF TPT OUTPUT		
			PETROLEUM	ELECTRICITY	TOTAL
Brazil	2.7	2.9	14.8	1.4	16.2
Canada	-0.4	2.4	9.5	0.6	10.1
China	-	3.5	17.3	1.5	18.8
France	2.9	2.9	4.9	0.7	5.6
Germany	2.9	3.4	4.7	0.9	5.6
India	4.7	4.0	20.1	1.6	21.6
Japan	-	2.3	6.6	1.7	8.2
Korea	-	2.3	18.8	0.6	19.4
South Africa	3.3	3.6	11.3	1.4	12.7
Thailand	0.9	1.9	25.1	1.1	26.2
USA	-	2.0	8.7	0.3	9.0

Source: NTDP Research.
 Note: TPT: Transport and Storage
 Petroleum: Coke, refined petroleum products and nuclear fuel
 Electricity: Electricity, gas and water supply

port sectors. Given that the taxation regime in transport sectors is complex, there is an urgent need to introduce fiscal reforms in this sector.

There may be many reasons for the transport sectors to be relatively less efficient compared with international standards. While we attempt to mimic overall reforms in sectors of transport, we also narrow down our focus on the efficiency introduced in these sectors just because of GST reforms in India's taxation structure. This is conceptualised through assuming a wedge to be narrowed down by reforms of various types.

Tax policies play an important role in the economy through their impact on both efficiency and equity. A good tax system should keep in view issues of income distribution. It should also endeavour to generate tax revenues to support government expenditure on public services and infrastructure development. Cascading tax revenues have differential impacts on firms in the economy with relatively high burden on those not getting full offsets. This analysis can be extended to international competitiveness of the adversely affected sectors of production in the economy. Such

domestic and international factors lead to inefficient allocation of productive resources in the economy. This results in loss of income and welfare of the affected economy.

For a developing economy like India, it is desirable to become more competitive and efficient in its resource usage. Apart from various other policy instruments, India must pursue taxation policies that would maximise its economic efficiency and minimise distortions and impediments to efficient allocation of resources, specialisation, capital formation and international trade. With regard to the issue of equity, it is desirable to rely on horizontal equity rather than vertical equity. While vertical equity is based on high marginal rates of taxation, both in direct and indirect taxes, horizontal equity relies on simple and transparent broad-based taxes with low variance across the tax rates.

In sum, implementation of a comprehensive GST in India is expected to lead to efficient allocation of factors of production, thus leading to gains in GDP and exports. This would translate into enhanced economic welfare and returns to the factors of production, viz. land, labour and capital.

Table 9.21
Percentage Change in Macro Variables, Implicit Import Tariff Simulations

ECONOMIC INDICATOR	SIM 1	SIM 2	SIM 3	SIM 4
GDP	0.0423	0.0326	0.0213	0.0148
Export	0.7361	0.5679	0.3703	0.2581
Import	0.5238	0.4041	0.2635	0.1837
Output	0.0247	0.0191	0.0124	0.0087
Real Return to Land	0.0427	0.0329	0.0215	0.0150
Real Return to Labor	0.0789	0.0609	0.0397	0.0277
Real Return to Capital	0.0678	0.0523	0.0341	0.0238

Source: Our simulation results.

We use a general equilibrium model to analyse the impact of tax rationalisation in transport services. Based on the economy-wide transactions, India is modelled to produce, consume and trade in 130 sectors of the economy. These sectors include 26 agriculture and allied services, 11 mining, 68 manufacturing, and 25 service sectors. There are five transport service sectors, viz. rail, land, water, air, and transport auxiliary services. The final demand equations for various sectors are obtained assuming a single representative consumer who maximises utility subject to a budget constraint. It is assumed that the revenue from tariffs and indirect taxes gets redistributed to consumers and then spent. Intermediate demands are derived from the profit-maximising decisions of the representative firms in each sector. The manufactured products' markets are assumed to depict monopolistic competition behaviour and those in rest of the sectors (agriculture, mining, and services) operate under perfect competition. In addition to the sectoral effects that are the primary focus of our analysis, the model also yields results for changes in exports, imports, the overall level of welfare (measured through GDP) in the economy, and the economy-wide changes in real wages and returns to land and capital. Because both labour and capital are assumed to be homogeneous and mobile across sectors in these scenarios, we cannot distinguish effects on factor prices by sector.

The wedge between the efficiency levels of transport services in India in comparison with some interna-

tional standard is not easy to quantify. We are not aware of any benchmarks in this regard. However, we have attempted to capture some elements of differences in the efficient delivery of transport services across a group of countries. The information on input-output flow matrices of these countries has been used for this purpose. The source of this information is OECD. The countries selected for such comparison are a mix of some developed and some developing countries. The set of countries in our sample include Brazil, Canada, China, France, Germany, India, Japan, South Africa, South Korea, Thailand and the United States. Transport intensity of total output, ratio of net indirect taxes to the output of transport services, and energy usage (petroleum products and electricity) per unit of output of transport services have been computed for all 11 countries. One of the major observations refers to the overall usage of transport services as intermediate input used by the economy as a whole. This refers to the cost incurred on the purchase of transport services for producing one unit of output of the economy. India uses 4 paise worth of transport services to produce one rupee worth of total output, i.e. a usage of 4 per cent (Table 9.20). This may be referred to as transport intensity. This is the highest value within the group of 11 selected countries. The corresponding value is 3.6 per cent for South Africa, 3.5 per cent for China and 2.9 per cent for Brazil. Thus the share of transport services used in each unit of total output in India is 11 per cent higher than that of South Africa, 14 per cent higher than that of China and 38 per cent higher than that of Brazil. The gap

is much higher with respect to developed countries. This implies relatively less efficient usage of transport services. Such an inefficiency wedge may arise due to tax complexity in transport sectors along with various other reasons including financing, maintenance, pricing, governance, etc. We have used a conservative estimate of 35 per cent for this wedge.

Another important observation addresses the issue of tax intensity of transport sectors. It is observed that the ratio of net indirect tax to the output of this sector is 4.7 per cent in India. This is much higher than the corresponding value of 3.3 per cent in South Africa, 2.9 per cent in France and Germany, 2.7 per cent in Brazil, and 0.9 per cent in Thailand. While it may not be easy to quantify the impact of tax intensity and complexity within the overall inefficiency wedge of 35 per cent, we have assumed this to be less than half and hypothesised it as 15 per cent.

India's transport services do not make efficient use of fuels consumed. The energy use for transport services in India is higher than most countries except for Thailand. This is a matter of concern with regard to the environmental pollution issues. The share of energy usage in India's transport sectors is 21.6 per cent which incorporates 20.1 per cent for petroleum products and 1.5 per cent for electricity. The total energy use intensity of transport sectors is 12.7 per cent in South Africa, 16.2 per cent in Brazil and 18.8 per cent in China. The developed countries have much lower values: France and Germany at 5.6 per cent, Japan at 8.2 per cent and the United States at 9 per cent.

In our experimental design, we attempt to simulate the impact of introducing efficiency in transport services through comprehensive reforms, inclusive of tax reform in these sectors as well as the sub-component of rationalisation of tax structure. In the absence of any benchmarks study of this nature, we undertake some hypothetical exercises for demonstration purposes. Various scenarios have been discussed to incorporate the impact of improved efficiency realised through overall reform as well as reducing tax-related complexities and introducing a uniform GST.

In the first scenario, we assume a wedge of 35 per cent between the efficiency of India's transport sectors vis-à-vis some international standard benchmark. This implies that we guesstimate an implicit import tariff of 35 per cent on all the sectors of transport. However, as mentioned earlier, we acknowledge this efficiency wedge could be due to a combination of factors including financing, ownership (public, private, or PPP), maintenance, pricing, governance, and taxation among others. We consider an alternative scenario where such wedge is assumed to be lower at 25 per cent. The third scenario assumes that the purely tax-related inefficiency wedge

The energy use of transport services in India is higher than most countries: 21.6 per cent, compared with 12.7 per cent in South Africa, 16.2 per cent in Brazil, and 18.8 in China.

may be even lower at 15 per cent. Fourthly, we also take into account the fact that all transport sectors may not be equally inefficient. We, therefore, attempt to simulate the inefficiencies in a non-uniform pattern, based on the respective transport intensity of each of the five transport sectors. All such wedges are assumed to be represented through equivalent import tariffs.

Simulation 1: Elimination of implicit import tariff of 35 per cent on all the transport service sectors

Simulation 2: Elimination of implicit import tariff of 25 per cent on all the transport service sectors

Simulation 3: Elimination of implicit import tariff of 15 per cent on all the transport service sectors

Simulation 4: Elimination of implicit import tariff of 10 per cent on land transport services; 15 per cent on rail, air and water transport services; and 25 per cent on support and auxiliary transport services

Results: Our results show that the economy gains under each of the four simulations. This implies that improved efficiency of transport sectors under all the four scenarios would have a welfare-enhancing impact for the economy. However, the extent of gains varies across experiments.

We observe that welfare gains for the economy vary between 0.042 per cent under Simulation-1 to 0.015 per cent under Simulation 4, depending upon the wedge that has been knocked off (Table 9.21). There are corresponding gains in trade and output.

As the economy adjusts to the new equilibrium, resources will be allocated more efficiently as compared to the base equilibrium. The real returns to all factors of production, land, labour and capital, increase.

Scale effect, an important indicator of efficient production, is measured as output per firm. Firms in the manufacturing sector have been modelled to operate under monopolistic competition. Under the assumption of free entry and exit, as the total output in a sector expands in a country, new firms may join in and vice versa. The positive scale effect refers to an increase in output per firm and may be considered as an indicator of enhanced scale and reduced costs in the situation of monopolistic competition in the relevant manufacturing sector. A negative scale effect refers to a decline in output per firm.

As suggested by the design of our simulations, efficiency reforms in the transport service sectors would

The issue of incorporating externalities, including congestion and pollution, in marginal cost pricing has not been addressed adequately while formulating tax rates.

lead to lower costs of service delivery for the end consumer. Access to relatively low-priced transport services would reduce the costs for firms with sectors under monopolistic competition in the medium-to-long run. While the firms are permitted to move in and out of the industry, only the efficient ones would stay in business. Competitive pressures leading to increasing returns of scale would show up as efficiency improvements in sectors. This would result in higher values of output per firm as the firms strive to achieve more efficient plant size and lower per unit costs. Thus, the gains in economic welfare are expected to come from improved allocation of resources, lower prices to consumers and business firms, and availability of more varieties to consumers. The realisation of economies of scale in manufacturing reinforces these welfare-enhancing effects.

The results of our demonstrative experiments bring out positive scale effects for all sectors of manufacturing. Even though the magnitude of scale effects varies across simulations, the pattern remains promising for the economy in each simulated scenario.

Economic development is becoming increasingly sensitive with regard to environmental implications. Any current policy is assessed for its environmental impact. In this section, we present and discuss the results of our simulations with special focus on energy sectors. Any changes in the energy sectors, in terms of consumption, are likely to have direct effects on the greening of Indian economy.

Based on the 130 sectors in the India input–output transaction table for the year 2003–04, we identify five core sectors that can be collectively referred to as the energy sector. These include natural gas, crude petroleum, petroleum products, coal tar products and electricity.

Various sectors of the economy have different energy requirements. We have computed energy intensities, defined as proportions of energy inputs in total inputs, across various sectors. Further, the composition of energy usage also varies across sectors with some sectors depending on a particular type of fuel. Our results show that two of the five transport services studied have high energy intensities.

The results of simulations indicate that enhanced efficiency of transport services will move the economy towards a new equilibrium with lower demand in each of the constituting sub-sectors of the composite energy sector. Thus, making transport sectors

more efficient than their current performance levels would not only be welfare-enhancing but also environment-friendly.

Long-run scenario: The provision of more efficient transport services would boost the efficiency of other sectors of production. The efficiency boost would depend on the proportional amounts of transport services consumed by these sectors. This would get reflected in sectoral export gains. We assume that the existing inefficiencies in the provision of transport services impact the export prices through implicit export taxes. These export taxes are computed as proportional shares of the use of transport services across all sectors of production. The taxes are normalised to a maximum of 15 per cent. We experiment with four other simulations assuming that the implicit export taxes in agricultural, mining and manufacturing sectors are now eliminated. Each of the four earlier simulations is now run superimposed with implicit export tax elimination. The gains in GDP, trade and returns to the factors of production are much higher than those reported in previous simulations.

CONCLUSION

The current transport pricing system is an accumulation of multiple taxes and user charges implemented at different points of time at varying levels of governance. In addition, fuel tax is an integral part of transport pricing. The taxation structure is quite different across modes and states. This is partly due to the existing constitutional provisions. The central government levies indirect taxes in the forms of union excise, import duty and service tax whereas the state governments levy sales tax/VAT, MVT, and P>. Taxes are imposed on inputs as well as outputs of transport services, thus affecting the cost and price structure in these sectors. The tax differentiation in this sector is determined by a number of parameters that vary across states, uses and types. Apart from taxes, governments also raise revenues through user charges. The toll charges are used mainly for the development and maintenance of road infrastructure. Similarly, route navigation facility charges; landing, parking and housing charges; terminal navigation landing charges; etc. are some of the user charges in the aviation sector. Ports also collect several user charges for port services.

Our documentation of taxes and user charges in various sectors of transport indicates that the prevailing regime is extremely complex. There are wide variations in tax regimes across states. The road transport sector has suffered on account of entry barriers through taxes imposed on interstate movement. Cities located across the state borders should share a common taxation mechanism so that unnecessary wastage of time and harassment at borders

are avoided. Intra-modal tax structures are also complex within each state. Taxes on various categories of fuel vary within and across states. The issue of incorporating externalities including congestion and pollution (social costs) in marginal cost pricing does not seem to have been addressed adequately while formulating the tax rates. Whereas revenue objective of pricing policy has been achieved partially, ad-hoc and complex nature of some of the taxes, especially at the state level, has resulted in less-than-efficient delivery of transport services which would, in turn, affect the efficiency of other sectors.

Inefficiencies in transport sectors get transmitted to other sectors of the economy as some of the sectors are relatively heavy users of transport services and have strong linkages with rest of the economy.

THE ROAD AHEAD

This chapter has documented the extreme complexity of taxes levied on the transport sector, particularly road transport. One key area of economic reform in India has been the simplification and rationalisation of taxes, both direct and indirect, at both the central and state levels.

It is therefore imperative that just as the state sales tax structure has been greatly simplified to a state VAT system, the road transport tax structure needs detailed review. Action needs to be taken to undertake a similar exercise across states to arrive at a simple and rational road transport tax structure that promotes economic efficiency and environmental sustainability. It is therefore recommended that the Ministry of Finance may convene an Empowered Committee of State Finance Ministers to undertake this exercise on collaboration with the Road Transport Ministry.

The mandate of the Empowered Committee would be to chart out a model act on road transport taxes and user charges. This would then be circulated among states and union territories for their consideration for adoption. Replacing various taxes (MVT, P>, etc.) by a single composite tax (some states have already implemented it) for all states is recommended by different stake holders. A relatively uniform and transparent tax regime would facilitate the move towards a common Indian market⁹. Uniformity of taxes among the states will give a boost to the interstate vehicle movement. The road tax system needs comprehensive reform rather than piecemeal and ad-hoc reforms at state level.

There is a need to integrate tax administration related to interstate movement of freight and passengers through information and communication technology (ICT) at national, state and regional level. This

User charges should be effectively collected for railway infrastructure as well. We recommend that Indian Railways should develop a system of accounting of depreciation and internalisation of all costs into its pricing system through user charges.

will greatly reduce transaction and logistic cost due to borderless and paperless movement. A competent authority may look into the possibility of implementing 'green channel' (Gujarat has already implemented) if proper paperwork has already been done in advance for specific consignments. A 'single window' clearance system for all types of taxes and charges at state border will greatly reduce transaction cost.

Transport infrastructure requires heavy capital investment and charges should be levied on users. User charges should be effectively collected for use of railway infrastructure as well. We recommend that Indian Railways should develop a system of accounting of depreciation and internalisation of all costs into its pricing system through user charges. Once the depreciation costs are accounted for, cross-subsidisation or direct subsidisation may still exist in its current form. It is important to emphasise that public transport pricing is widely used as an instrument of poverty alleviation. The fares are regulated in developing countries in order to provide affordable mode of transport to the poor. We do not recommend completely doing away with cross-subsidisation. Moreover, considering the resource constraints such as energy resources, taxation on transport is required to be designed to encourage public transportation. It is also environmentally desirable to promote the use of public transport. However, developing a system of accounting for infrastructure cost and user charges is important.

We also recommend that the competent authority proposed should undertake a study to identify and quantify the efficiency loss in transport sectors due to several obstacles for free movement of freight across states. Special focus should be given to the complexity of the tax system and lack of harmonisation of regulations across states.

Also, negative externalities need to be internalised in transport pricing, especially in urban transport. However, it is very difficult to estimate the exact monetary figure for the marginal social cost. We recommend the formation of an expert group to look into this possibility. Once a reasonable figure is found, a composite and uniform tax can replace current ad-hoc environmental cesses at state

9. This Act may be somewhat analogous to the Model Act on Agricultural Marketing (2003).

level. It is up to the expert group to decide the proper base for the environmental tax in transport.

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