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Abstract

Power sector subsidies constituted 83% of the federal government's total subsidies of PRs558 billion in 2012; the tariff differential subsidy (TDS) amounted to PRs457 billion. TDS is provided to distribution companies (DISCOs) to cover the difference between the NEPRA-approved tariff schedules and the uniform tariff schedule (by consumer group) set by the Ministry of Water and Power for all regions of the country. The tariff approved by NEPRA takes account of all components of DISCOs' costs, including salaries, overheads, depreciation and maintenance, line losses, return on assets and so on. These cost elements differ across DISCOs. The fact that NEPRA approves different per-unit tariffs while the Ministry of Water and Power sets a uniform tariff (by consumer group) across all DISCOs implies that each DISCO receives a different per-unit TDS (by consumer group) from the federal government. The TDS to individual DISCOs can be aggregated to calculate provincial shares in the total power sector subsidy.

This paper outlines the electricity tariff determination process; reports on the TDS by consumer group, DISCO and province; and considers the likely changes in the federal/provincial shares of the divisible pool of tax revenue if TDS were given to the provinces in the form of a revenue share from the divisible pool. We find that residential consumers are the highest recipients of TDS and that it is distributed unequally among the DISCOs. Moreover, TDS is distributed unequally among the four provinces and the distribution is not in line with the shares determined under the 7th National Finance Commission Award.

Keywords: Energy consumption, energy prices, electric utilities, electricity, electricity sector, regulation, federalism, subsidies.

JEL classification: Q430, L940, L980, H240, H250, H770.

Interprovincial Differences in Power Sector Subsidies and Implications for the NFC Award

Umbreen Fatima and Anjum Nasim*

1. Introduction

Power sector subsidies constituted 83% of the federal government's total subsidies of PRs558 billion in 2012 (including arrears of PRs312.8 billion from previous years). The tariff differential subsidy (TDS) amounted to PRs457 billion, including arrears. The TDS is provided to distribution companies (DISCOs) to cover the difference between the tariff schedules approved by the National Electric Power Regulatory Authority (NEPRA) (which can differ across DISCOs) and the uniform tariff schedule (by consumer group) notified by the Ministry of Water and Power (MoWP) for all regions of the country.

The NEPRA-approved tariff takes account of DISCOs' revenue requirements and factors in various elements of cost. In calculating the average tariff, NEPRA also takes into account companies' transmission and distribution (T&D) losses. Both revenue requirements and T&D losses differ across DISCOs, which is duly reflected in NEPRA-approved tariffs.

The fact that NEPRA approves different tariffs across DISCOs while the MoWP sets uniform tariffs (by consumer group) implies that each DISCO receives a different TDS from the federal government. This translates into different subsidies for each province. By aggregating the TDS by consumer group across all DISCOs, we can also calculate the aggregate subsidy by consumer group.

In this paper, we calculate the subsidies provided to each of the country's ten DISCOs[1], to individual consumer groups, and to the provinces. The TDS effectively reduces the federal government's share in the divisible pool of taxes compared with the 42.5% share approved under the 7th National Finance Commission (NFC) award. We also calculate the share of the four provinces in the divisible pool by factoring in provincial TDS shares for the finan-

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[1] These include the nine DISCOs, which are government-owned companies, and the Karachi Electric Supply Company (KESC), which is a privately owned company. Although the Tribal Electric Supply Company (TESCO) was also created as a DISCO, it has not yet been licensed (see Government of Pakistan, 2013) and is therefore not included in our calculations.

cial year (FY) 2011/12.[2]

Section 2 outlines the electricity tariff determination process. Section 3 reports on the TDS by DISCO, by consumer group, and by province. Section 4 considers changes in the federal/provincial shares of the federal divisible tax revenue, were the TDS to be distributed among the provinces as part of the revenue-sharing arrangement under the NFC award (treated as a revenue transfer in the divisible pool). Section 5 provides some concluding remarks.

2. Tariff Determination Process

The tariff-setting process involves the following steps:

DISCOs send their tariff proposals to NEPRA, justifying their costs and revenue requirements.

NEPRA sets tariffs for various consumer categories for each DISCO based on its own assessment of costs and revenue requirements, which can differ from those provided by the DISCOs. It then communicates these to the MoWP, recommending that the tariff be notified.

The MoWP notifies a tariff schedule for various consumer categories, which are common across all DISCOs (Government of Pakistan, 2013).

Typically, the MoWP notifies a minimum tariff for each consumer category across all DISCOs while NEPRA sets tariffs that take into account the various cost components of each DISCO. These components are explained below:

Power purchase price (PPP). This is the projected cost at which a DISCO will purchase power. It comprises the generation cost and the cost of transmission by the National Transmission and Distribution Company (NTDC) of the total power that a DISCO is projected to purchase during the year.

Net distribution margin. This is the difference between the gross distribution margin and a DISCO's 'other income'. The gross margin consists of operation and maintenance costs, depreciation, and return on assets (ROA) base. 'Other income' includes the amortization of deferred credit, meter and rental income, late payment surcharges, profit on bank deposits, the sale of scrap, income from nonutility operations, the commission on PTV fees, and miscellaneous incomes. This allows a normal ROA.

Prior year adjustment (PYA). Each year, an adjustment for the previous year is built into the current year's tariffs. The 'shortfall' between the projected and regulator-approved actual cost in year *t-1* is recovered by including it in the tariff for period *t*. This adjustment accounts for the difference between (i) the projected and actual electricity units purchased by DISCOs from the NTDC at the notified tariffs, (ii) the projected and actual distribution

[2] The Pakistan government's financial year starts on 1 July and ends on 30 June of the following year.

margins, (iii) the actual and notified previous year's adjustment,[3] (iv) projected and actual 'other income', and (v) the projected and actual consumption mix.[4]

NEPRA determines an average tariff after including all the cost components and dividing the sum by projected sales. The projected sales figure also takes into account DISCOs' T&D losses. Thus, in the case of the Lahore Electric Supply Company (LESCO), NEPRA projected its power purchase and sales in FY2011/12 to be 17,547 GWh and 15,441 GWh, respectively, allowing 12% as T&D losses. The total cost was estimated at PRs170,585 million. The average tariff was PRs11.05/kWh, which was obtained by dividing PRs170,585 million by 15,441 GWh. This implies that differences in line losses translate into differences in NEPRA-determined tariffs across DISCOs. The differences in line losses across DISCOs are shown in Table 1.

As shown in Table 1, NEPRA-allowed line losses vary between 9.5% in the case of the Islamabad Electric Supply Company (IESCO) and 28% in the case of the Peshawar Electric Supply Company (PESCO) and Sukkur Electric Power Company (SEPCO). We note that the actual line losses are higher than the NEPRA-allowed line losses. The consequent loss of revenue for the DISCOs carries over into the next year and is reflected in the tariffs for that year. Line losses occur on account of technical losses and 'nontechnical' or 'commercial' losses, the latter being a euphemism for pilferage and other corrupt practices.

Table 1: Line losses across DISCOs in FY2011/12 (percent)

DISCO	NEPRA-allowed line losses	Actual line losses
IESCO	9.50	9.52
LESCO	12.00	13.51
GEPCO	10.50	11.24
FESCO	10.83	10.91
MEPCO	15.00	17.94
HESCO	22.00	27.73
SEPCO	28.00	39.51
PESCO	28.00	35.97
QESCO	18.00	20.87

Source: NEPRA (various issues).

[3] To gauge this, consider three time periods, $t = 1, 2$, and 3. Suppose, in year 1, a DISCO's total cost plus normal profits were PRs10,000 and its projected sales were 1,000 units, which equalled its purchases from the NTDC (assuming zero line losses). NEPRA would then set the tariff at PRs10 per unit in period 1 to allow the DISCO to recover its costs and earn normal profits. If actual sales/purchases in period 1 were 900 units, then at the notified tariff the DISCO would have suffered a loss of PRs1,000 because of the difference in actual and projected units purchased/sold. To recover this loss, the tariff in period 2 would include a component on account of PYA. Thus, suppose in year 2, total costs were again PRs10,000 and projected sales were 1,000 units. Without PYA, the tariff would be set at PRs10 per unit, but if a PYA of PRs1,000 was allowed, then the tariff would increase by PRs1 from PRs10 per unit to PRs11 per unit. If actual sales in period 2 were again 900 units, then the DISCO's losses would be PRs1,100 of which PRs100 would be on account of the difference between the notified PYA (PRs1 x 1,000 = PRs1000) and actual PYA (PRs1 x 900 = PRs900). In setting the tariff for year 3, the PYA would be taken into account and one of the components of the PYA adjustment would be the difference between the notified PYA (PRs1,000) and actual PYA (PRs900).

[4] The tariff schedules assume a sales mix within the various categories and subcategories of consumers. The actual sales mix may be different from the assumed sales mix and this can also upset the total revenue of the DISCOs. Accordingly, an adjustment is also made on this account.

Differential line losses do not necessarily imply differences in the efficiency of these DISCOs. Table 2 shows that coverage varies across DISCOs, which can also explain differences in technical losses, eg LESCO's service area is 16,400 km^2 compared to the Multan Electric Power Company (MEPCO), which has a service area of 105,505 km^2.

DISCOs also differ in their collection of utility bills from consumers. Table 3 shows the differences in collection as a percent of billing across the provinces. Such differences in collection add to the liabilities of the DISCOs and, therefore, of the government, but these are not taken into account at the time of NEPRA's tariff determination. NEPRA assumes a collection rate of 100% in its tariff assessment for DISCOs.

Table 2: Distribution of service areas

DISCO	Service area (km^2)	Service area
PESCO	74,521	Province of Khyber Pakhtunkhwa, except tribal areas
TESCO	-	Khyber, Bajaur, Mohmand, Orakzai, Kurram, North Waziristan, South Waziristan, Frontier Region Peshawar, Frontier Region Kohat, Frontier Region Bannu, Frontier Region Tank, Frontier Region Lakki Marwat, Frontier Region Dera Ismail Khan
IESCO	45,000	Islamabad, Rawalpindi, Attock, Jhelum, Chakwal
GEPCO		Gujranwala, Sialkot, Mandi Bahauddin, Hafizabad, Narowal, Gujrat
LESCO	16,400	Lahore, Sheikhupura, Kasur, Okara, Nankana
FESCO		Faisalabad, Sargodha, Khushab, Jhang, Toba Tek Singh, Bhalwal, Mianwali, Bhakkar
MEPCO	105,505	Multan, Rahimyar Khan, Khanewal, Sahiwal, Pakpattan, Vehari, Muzaffargarh, Dera Ghazi Khan, Leiah, Rajanpur, Bahawalpur, Lodhran, Bahawalnagar
HESCO	70,458	Hyderabad, Jamshoro, Shaheed Benazirabad, Sanghar, Matiari, Badin, Mirpur Khas, Umerkot, Tharparkar, Tando Muhammad Khan, Tando Allahyar, Thatta
SEPCO	56,300	Sukkur, Khairpur, Kashmore, Kandhkot, Jacobabad, Shikarpur, Larkana, Kambar, Shahdadkot, Dadu, Naushehro Feroze, Ghotki, Mirpur Methelo, Rahimyar Khan
QESCO	34,800	Province of Balochistan, except Lasbela where KESC is responsible for power distribution
KESC	3,530	All of Karachi, including Lasbela

Source: NEPRA (various issues).

Table 3: Collection as a percent of billing, FY2011/12

Province	Collection as a percent of billing
Punjab	97.03
Sindh	60.38
KP	67.90
Balochistan	36.15

Source: NEPRA (2012).

NEPRA approves different tariff schedules for different categories of consumers: residential, commercial, industrial and agricultural. Additionally, there are consumers who buy power in bulk for further distribution. Each category is also distinguished by its load requirement and offered separate rates. Rates also vary by time of use (peak and off-peak).

The tariffs determined by NEPRA are reference tariffs and subject to monthly and quarterly adjustments, which allow for variations in actual PPP costs from those projected at the time of tariff setting. Variations in fuel cost are reflected in monthly adjustments and a number of other PPP-related costs are reflected in quarterly adjustments. These adjustments are then passed through and reflected in consumers' monthly bills.[5]

The process of tariff determination begins towards the end of the financial year and continues throughout the year. Table 4 shows that NEPRA admitted tariff petitions for FY2011/12 as late as 28 November 2011. The approval process takes several months and there are further delays in notification by the MoWP. In FY2011/12, the ministry notified a common tariff schedule around mid-May 2012, when the fiscal year was coming to a close.

There have been some recent developments in the tariff determination process. On 5 August 2013, the MoWP notified consumer tariffs after receiving NEPRA's tariff recommendations but later notified another tariff schedule on 30 September 2013, with higher tariffs than those announced in August. The Supreme Court took suo moto notice and questioned whether the ministry was empowered to notify tariffs without NEPRA's involvement. As a result, the MoWP withdrew its notification and referred the matter to NEPRA. Since the new tariffs set by the MoWP were below those recommended by NEPRA, the latter did not revise its tariffs and, instead, notified its old tariffs together with consumer tariffs incorporating the new TDS, effectively notifying the consumer tariffs of 30 September 2013.

[5] The monthly and quarterly adjustments are pass-through items (see http://nepra.org.pk/Tariff/DISCOs/LESCO/2012/TRF-176%20LESCO%2010-01-2012%20227-29.PDF, p. 7) but from time to time consumers have approached the courts to obtain stay orders and succeeded in postponing the impact of these adjustments.

Table 4: Dates of tariff petition admission, approval and notification, FY2011/12

DISCO	NEPRA petition acceptance date	NEPRA approval date	Government notification date
KESC	-	-	16 May 2012
FESCO	1 November 2011	15 March 2012	16 May 2012
HESCO	27 September 2011	8 March 2012	16 May 2012
GEPCO	6 June 2011	13 December 2011	16 May 2012
IESCO	24 August 2011	19 January 2012	16 May 2012
MEPCO	28 June 2011	2 January 2012	16 May 2012
LESCO	14 July 2011	10 January 2012	16 May 2012
PESCO	22 July 2011	20 January, 2012	16 May 2012
QESCO	12 August 2011	10 January 2012	16 May 2012
SEPCO	28 November 2011	30 March 2012	16 May 2012

Source: NEPRA (various issues) and MoWP (2012a–2012j).

3. TDS by DISCOs, Consumer Groups, and Provinces

As mentioned earlier, the tariff schedule notified by the MoWP is common to all DISCOs although NEPRA approves different tariff schedules for each DISCO. The difference between the NEPRA-approved tariff and the tariff notified by the ministry is the TDS.

In this section, we calculate the TDS for each DISCO and consumer group for FY2011/12 by taking the difference between the NEPRA-approved tariffs and corresponding tariffs notified by the MoWP for FY2011/12 and multiplying the difference by the sales mix projected by NEPRA. Since the MoWP notifies tariffs towards the end of the financial year (see Table 4), which then remain effective for most or all of the following financial year, this method involves calculating the TDS as the difference between the NEPRA-approved tariff for a particular financial year and the tariff charged by a DISCO the following year. The subsidy so calculated has budgetary implications for FY2012/13 but we refer to this as TDS for 2011/12.

NEPRA (2012) provides data on the Karachi Electric Supply Company's (KESC's) consumer mix for broad categories of consumer groups, but unlike for other DISCOs, the breakdown of the consumption mix within each consumer group is not available. We approximate this consumption mix for the KESC by assuming that the distribution within each consumer group (eg industrial consumers) is the same as that of LESCO.

[6] In January, 2014 the KESC was renamed as K-Electric.

[7] If, within LESCO, industrial consumption under the B-1(a) tariff was 5.73% in FY2011/12, then we assume that, of the KESC's total industrial consumption of 3,342 GWh in FY2011/12, the B-1(a) tariff applies to 5.73% of its total industrial consumption.

3.1 TDS Received by DISCOs

The TDS for each DISCO in FY2011/12 is calculated in three steps: (i) the TDS per unit for each consumer category is calculated as the difference between the NEPRA-approved tariff and the government-notified tariff,[8] (ii) the difference in the tariffs is multiplied by the sales mix projected by NEPRA for FY2011/12 to obtain the TDS for each consumer category, and (iii) the TDS for each consumer category is then aggregated over all consumer categories.

Residential consumers face electricity tariff slabs that increase with rising consumption. Since FY2010/11, NEPRA has recommended giving the benefit of lower tariffs to domestic consumers for only one previous slab, but the government has allowed them the benefit of lower tariffs on all previous consumption.[9] This could have an impact on TDS calculations for residential consumers because the sales mix projected by NEPRA (which assumes the benefit of one previous slab) will be different from projected sales if the benefit of all previous lower slabs is allowed.[10] In order to address this issue, we refer to the sales mix ratios for 2009/10, when there was no difference between the two assessments. Using these sales mix ratios and the projected total sales to residential consumers in 2011/12, we calculate the TDS for residential consumers. This substitution of the 2009/10 sales mix for 2011/12 is necessary only for residential consumers and not other consumer categories. The decision to give the benefit of only one previous slab was made by NEPRA in 2010/11.[11]

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[8] We have taken the NEPRA-approved tariff to be its reference tariff. Monthly and quarterly revisions are passed through to consumers and therefore ignored in our TDS calculations (Government of Pakistan, 2013, p. 13). See also http://nepra.org.pk/Tariff/DISCOs/LESCO/2012/TRF-176%20LESCO%2010-01-2012%20227-29.PDF, p. 7.

[9] Thus, for domestic consumers who consume 800 units of electricity and fall in the tariff slab of 700+ units, NEPRA recommends that, for the first 700 units, they be charged the tariff applicable to consumers in the 301–700 unit slab; for the remaining 100 units, they are charged the tariff applicable to consumers in the 700+ unit slab. The government, on the other hand, has allowed progressively higher rates to be charged for consumption units that fall in the 0–100, 101–300, 301–700 and 700+ slabs, respectively.

[10] If NEPRA recommends that the benefit of one previous tariff slab be passed onto domestic consumers, then a consumer projected to consume 800 units (see footnote 9) would correspond to a consumer mix of 700 units in the 301–700 slab and 100 units in the 700+ slab. If government policy were followed, then the consumer mix would be 100 units in the 0–100 slab, 200 units in the 101–300 slab, 400 units in the 301–700 slab and 100 units in the 700+ slab. NEPRA's projected consumer sales mix for each DISCO is known but that of the government is not.

[11] See http://www.nepra.org.pk/Tariff/DISCOs/LESCO/2010/TRF-155%20LESCO%20IST%20QUARTER%20JULY-SEPTEMBER%202010%20-%202011.PDF, p. 30.

Table 5 gives the TDS by DISCO; Appendix 1 calculates this subsidy for LESCO.

Table 5: TDS by DISCO, FY2011/12

DISCO	Subsidy (PRs billion)	No. of consumption units (GWh)	Subsidy per unit (PRs/kWh)
IESCO	8.31	7,940	1.05
SEPCO	14.03	3,097	4.53
HESCO	15.64	3,725	4.20
QESCO	19.55	4,336	4.51
GEPCO	19.33	6,754	2.86
FESCO	22.96	8,921	2.57
LESCO	27.60	15,437	1.79
MEPCO	36.92	10,947	3.37
PESCO	41.59	8,229	5.01
KESC	45.27 a	10,279	4.40
Total	**251.21**	**79,735**	**3.15**

Source: NEPRA (various issues) and authors' calculations.
a = Although NEPRA (2012) provides data on the aggregate units sold to each consumption subcategory for KESC, there is no information on the number of units sold to consumer subcategories. Therefore, we have projected the units consumed by each KESC consumer subcategory by using LESCO as a reference case to allocate units to each consumer subcategory. The projected units thus calculated are used to calculate the TDS.

The variation across DISCOs in terms of subsidy per unit (kWh) is quite striking, with IESCO receiving PRs1.05 per kWh and PESCO receiving PRs5.01 per kWh. As discussed earlier, tariff differentials do not necessarily imply that some DISCOs are more efficient than others. One factor that might explain differences in cost is the difference in customers' geographical concentration, the resulting difference in T&D networks and their associated overheads and maintenance costs and line losses. An analysis of these issues is, however, beyond the scope of this paper.

3.2 TDS by Consumer Group

NEPRA distinguishes between different categories of consumers: residential, industrial, agricultural, commercial and bulk purchasers, etc. (see Appendix 1 for details). Within each category are further subcategories, eg residential consumers are subdivided into those with a sanctioned load of less than 5 kW and those with a sanctioned load above 5 kW; within the first category, consumers are further distinguished by the number of units consumed (up to 50 units, 1–100, 101–300, 301–700 and 700+). For each subcategory, there is a NEPRA-approved tariff and an MoWP-notified tariff. Aggregating the TDS for all subcategories within a consumer group and across all DISCOs gives the aggregate subsidy for the consumer group (Table 6).

Table 6 gives two sets of calculations: one set excludes KESC and the other includes KESC. This is because, as explained above, the subsidies by consumer group for the

KESC are based on an approximation; separating these allows us to see the per-unit subsidies by consumer group for DISCOs whose consumption mix is based on NEPRA projections and not on an approximation involving the consumption mix of another DISCO (in this case, LESCO).

We observe that all consumer groups receive a subsidy. Residential consumers, however, receive the largest subsidy, both in absolute terms and per-unit terms.

Table 6: TDS by DISCO, FY2011/12

Consumer category	Excluding KESC			Including KESC		
	Subsidy (PRs billion)	No. of consumption units (GWh)	Subsidy per unit (PRs/kWh)	Subsidy (PRs billion)	No. of consumption units (GWh)	Subsidy per unit (PRs/kWh)
Residential	126.84	31,891	3.98	150.23	36,455	4.12
Agricultural	28.65	9,332	3.07	29.04	9,466	3.07
Commercial	12.38	4,994	2.48	17.15	6,122	2.80
Bulk supply	4.19	2,224	1.89	6.86	3,030	2.27
Industrial	36.01	19,022	1.89	49.19	22,364	2.20
Other	-2.14	1,993	-1.07	-1.25	2,298	-0.55
Total	**205.94**	**69,456**	**2.97**	**251.21**	**79,735**	**3.15**

Source: NEPRA (various issues) and authors' calculations.

3.3 TDS by Province

We calculate the provincial TDS using the subsidy estimates given in Table 5: the DISCOs are all categorised by province and their respective subsidies summed over each province. IESCO provides electricity to consumers in the federal capital, Islamabad, as well as four districts of Punjab (Rawalpindi, Jhelum, Chakwal and Attock). The other DISCOs in Punjab are LESCO, MEPCO, the Gujranwala Electric Power Company (GEPCO) and Faisalabad Electric Supply Company (FESCO). Those in Sindh are the KESC, the Hyderabad Electric Supply Company (HESCO) and SEPCO. Those in KP and Balochistan are, respectively, PESCO and the Quetta Electric Supply Company (QESCO). The subsidies by province are given in Table 7. Due to data limitations, our aggregation does not account for the fact that Lasbela is provided electricity by KESC and that some portions of Rahimyar Khan are supplied by SEPCO (NEPRA, 2012).

In absolute terms, Punjab is the largest recipient of TDS but the per-unit subsidy it receives is about half that of Sindh and Balochistan and about 46% that of Khyber Pakhtunkhwa (KP). Punjab's overall TDS is about 46% of the total TDS, which is considerably less than its share of the population (56%) and the provincial divisible pool of tax revenues (51.74%) under the 7th NFC Award.

Table 7: TDS by province, FY2011/12

Province	Subsidy (PRs billion)	No. of consumption units (GWh)	Subsidy per unit (PRs/kWh)
Punjab	115.12	49,999	2.30
Sindh	74.95	17,101	4.38
KP	41.59	8,299	5.01
Balochistan	19.55	4,336	4.51
Total	**251.21**	**79,735**	**3.15**

Source: NEPRA (various issues) and authors' calculations.

4. The TDS and the NFC Award

NFC awards are constituted every five years under Article 160 of the Constitution of Pakistan as a revenue-sharing arrangement between the federal and provincial governments. The transfer of resources from the federal government to the provinces under this award covers not only transfers from the divisible pool of taxes but also straight transfers such as royalties on crude oil and natural gas, gas development surcharges, excise duty on natural gas and general sales tax on telecom and other services. For the purposes of this analysis, we compare TDS across the provinces based on the tax revenue-sharing arrangement under the 7th NFC Award.

The NFC tax revenue-sharing involves two steps. The first step involves a distribution of tax revenues between the centre and provinces (vertical distribution). The second step involves distribution of the provincial tax revenue-share among all four provinces (horizontal distribution).

Under the 7th NFC award, the provincial share in vertical revenue distribution was increased to 56% in FY2010/11, and to 57.5% from FY2011/12 till the end of the award. This left 44% of the divisible pool of taxes for the federal government in 2010/11 and 42.5% in each subsequent year of the five-year award.

Horizontal distribution shares under the 7th NFC Award for Punjab, Sindh, KP and Balochistan were, respectively, 51.74%, 24.55%, 14.62% and 9.09%. Additionally, KP receives 1% of the divisible pool because of the ongoing insurgency in the neighbouring Federally Administered Tribal Areas (FATA) and its fallout on law and order in KP. This share is deducted from the divisible pool before any other allocation between the federal and provincial governments or among the provinces. Table 8 summarises the provincial shares in the horizontal distribution of tax revenues under the 7th NFC award and the budgeted amount received by the provinces in FY2011/12.

Table 8: Horizontal distribution of divisible pool of tax revenues

Province	Share (%)	Amount (PRs billion) in 2011/12
Punjab	51.74	530.81
Sindh	24.55	251.86
KP	14.62	149.99*
Balochistan	9.09	93.26
Total	**100.00**	**1025.91**

Source: Government of Khyber Pakhtunkhwa (2010).
* Does not include 1% transferred to KP on account of the war on terror.

The increased fiscal space for the provinces created by the 7th NFC Award was, to some extent, curtailed by the greater expenditure responsibilities devolved to the provinces under the 18th Amendment. The last few years, particularly FY2007/08 onwards, have seen the international price of oil escalate, resulting in an increase in the cost of electricity generation, which depends heavily on imported fuel. The federal government did not, however, adjust electricity prices against the higher cost of production and absorbed most of this change in the form of subsidies. This has severely restricted its fiscal space.

As we have noted, one of the objectives of the electricity subsidy is to equalise electricity tariffs by consumer group across all regions of the country, but as our calculations show, this has resulted in unequal tariff subsidies across the provinces.

The provinces' TDS shares can be compared with their share of tax revenue in the horizontal distribution of tax revenues under the 7th NFC award. The award is an agreement on how major tax revenues should be distributed between the federating units and the centre. The spirit of this agreement would be violated if the centre were to use its own share of tax revenues for province-specific expenditures in a manner that departs consistently (year after year) from the revenue-sharing arrangement under the award. Although the federal government would be justified in departing from the NFC allocation if a province were to suffer a temporary shock (such as floods or drought), escalating oil prices and the consequent rise in electricity generation costs cannot be treated as a temporary shock. The NFC award is, therefore, a useful yardstick to judge if the federal government has judiciously allocated its tariff subsidies across the provinces.

Table 9 compares the shares of the provinces in the horizontal distribution of the divisible pool of taxes with their shares of TDS in FY2011/12. The comparison suggests that, in FY2011/12, Sindh and KP received a greater share of TDS than their share in the horizontal distribution of the divisible pool of taxes, while Punjab and Balochistan received a smaller share.

Another way of looking at this is to consider the relative share between the centre and the provinces and among the provinces if TDS were to be distributed among the provinces as part of the revenue-sharing arrangement under the NFC award.

Table 9: Comparison of provincial shares in horizontal distribution of divisible pool of taxes and TDS, FY2011/12

Province	Horizontal distribution of divisible pool of taxes (%)	Share of TDS (%)
Punjab	51.74	45.83
Sindh	24.55	29.84
KP	14.62	16.56
Balochistan	9.09	7.78
Total	**100.00**	**100.00**

Source: NEPRA (various issues) and authors' calculations.

Table 10 summarises the changes in the vertical and horizontal revenue-shares for FY2011/12 if the divisible pool of taxes were adjusted for the TDS. If PRs251 billion of the subsidy (see Table 7) were to be transferred to the provinces, the centre's share would fall from 42.5% to 28.4% and the share of the provinces would rise from 57.5% to 71.6%. As a result of the adjustment, in the horizontal distribution, the shares of Punjab and Balochistan would go down to 50.58% and 8.83%, respectively, whereas Sindh and KP would gain from this arrangement with their shares going up to 25.59% and 15.00%, respectively. If we allow for such adjustments in the revenue-sharing arrangement, the federal/provincial shares will vary from year to year as the TDS is determined for each year unlike the federal/provincial shares under the NFC award, which are constant.

Table 10: Vertical and Horizontal Distribution with and without TDS, FY2011/12

	Share of 7th NFC award (%)	Share of NFC award (PRs billion)	TDS (PRs billion)	Share with TDS included in transfers (PRs billion)	Adjusted share (%)
Vertical Distribution					
Federal	42.5	758.28	-251.21	507.07	28.4
Provincial	57.5	1,025.91	251.21	1,277.12	71.6
Total	**100**	**1,784.91**		**1,784.91**	**100**
Horizontal Distribution					
Punjab	51.74	530.81	115.12	645.9	50.58
Sindh	24.55	251.86	74.95	326.8	25.59
KP	14.62	149.99	41.59	191.6	15.00
Balochistan	9.09	93.26	19.55	112.8	8.83
Total	**100.00**	**1,025.91**	**251.21**	**1,277.1**	**100.00**

Source: Government of Khyber Pakhtunkhwa (2010) and authors' calculations.

5. Concluding Remarks

Applying uniform tariffs across the country in the presence of highly divergent NEPRA-determined tariffs results in differential subsidies across DISCOs and provinces. The diverging subsidies across the provinces are principally because of differences in line losses (on account of technical and commercial losses, with the latter a euphemism for pilferage and corruption). DISCOs vary greatly in terms of area served, which can explain differences in technical losses. Differential subsidies to DISCOs because of differences in technical losses may be rationalised but those on account of commercial losses simply reward inefficiency and corrupt practices. Neither the DISCOs nor NEPRA distinguish between technical and commercial losses. This opaqueness should be removed to design tariff and subsidy policies that do not reward corrupt practices.

Differences in subsidies across DISCOs also imply very different allocations of federal expenditure across the provinces. The inclusion of TDS in the revenue-sharing arrangement between the centre and the provinces provides a better perspective on resource allocation between the centre and provinces and across the provinces. Technically, the federal government is under no obligation to follow the NFC award in allocating its expenditures, but in a federal structure, there should be some guiding principles that constrain the federal government's arbitrariness. In this paper, we have calculated TDS by consumer group, DISCO and province and used the NFC award as a yardstick to determine whether tariff subsidies by the federal government depart from the NFC principle. We find that they do.

Unless there is a clearly stated principle that carries a broad consensus and allows departures from the NFC award, federal expenditures that are province-specific should be judged against the benchmark of the award. Our analysis can be generalised to include not just the TDS but also other federal expenditures that might be similarly allocated to particular provinces. This would include, for example, subsidies provided to DISCOs for their losses.

There are other forms of resource transfers that are not fully reflected in the NFC award. Implicit subsidies on CNG and natural gas are also distributed differentially across the provinces. A comprehensive view of such subsidies should be reflected in the next NFC award in addition to incorporating a mechanism that governs federal/provincial sharing of expenditure shocks and subsidies that do not place an unsustainable fiscal burden on the center or the provinces.

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Appendix I
TDS Calculation for LESCO

	Description	Fixed charge-NEPRA (PRs/ kW/M)	Fixed charge-MOWP (PRs/ kW/M)	Variable charge-MOWP (PRs/ kWh)	Variable charge-NEPRA (PRs/ kWh)	Sales mix (GWh)	Installed capacity (kW)*	Subsidy (PRs million)
A-1	*Residential*							
	a) For sanctioned load less than 5 kW							
	i. Up to 50 units	-	-	2	3	132		132
	Consumption exceeding 50 units							
	ii. 01-100 units	-	-	5.79	9.27	2,412		8,394
	iii. 101-300 units	-	-	8.11	10.5	2,338		5,588
	iv. 301-700 units	-	-	12.33	13.5	733		857.6
	v. Above 700 units	-	-	15.07	15.5	565		243
	b) For sanctioned load 5 kW and above							
	Time of day (TOD): Peak	-	-	13.99	15	0		0
	Time of day (TOD): Off-Peak	-	-	8.22	9.5	0		0
	Subtotal of consumption units					**6,180**		
	Subsidy subtotal							**15,214.14**

	Description	Fixed charge-NEPRA (PRs/ kW/M)	Fixed charge-MOWP (PRs/ kW/M)	Variable charge-MOWP (PRs/ kWh)	Variable charge-NEPRA (PRs/ kWh)	Sales mix (GWh)	Installed capacity (kW)*	Subsidy (PRs million)
B	*Industrial*							
B-1(a)	Up to 25 kW (at 400/230 volts)	-	-	10.51	11.5	362		358.38
B-1(b)	Up to 25 kW (TOU peak)	-	-	13.99	15	11		11.11
B-1(b)	Up to 25 kW (TOU off-peak)	-	-	8.22	9.5	55		70.4
B-2(a)	Exceeding 25-500 kW (at 400 volts)	400	400	9.14	10	1,232		1,059.52
B-2(b)	Exceeding 25-500 kW (TOU peak)	400	400	12.77	15	59		131.57
B-2(b)	Exceeding 25-500 kW (TOU off-peak)	400	400	8.01	9.3	302		389.58
B-3	For all loads up to 5,000 kW at 11/33 kV (TOU peak)	380	380	12.68	14.7	405		818.1
B-3	For all loads up to 5,000 kW at 11/33kV (TOU off-peak)	380	380	7.75	9.2	3,245		4,705.25
B-4	For all loads at 66.132 kV and above (TOU peak)	360	360	12.37	14.5	91		193.83
B-4	For all loads at 66.132 kV and above (TOU off-peak)	360	360	7.46	9.1	559		916.76
	Subtotal of consumption units					**6,321**		
	Subsidy subtotal							**8,654.5**

	Description	Fixed charge-NEPRA (PRs/ kW/M)	Fixed charge-MOWP (PRs/ kW/M)	Variable charge-MOWP (PRs/ kWh)	Variable charge-NEPRA (PRs/ kWh)	Sales mix (GWh)	Installed capacity (kW)*	Subsidy (PRs million)
C	Single-point supply for further distribution							
C1(a)	Supply at 400 volts- Sanctioned load less than 5 kW		-	11.55	12	1		0.45
C1(b)	Supply at 400 volts-Sanctioned load 5 kW and up to 500 kW	400	400	10.35	11	41		26.65
C1(c)	Supply at 400 volts -Sanctioned load 5 kW and up to 500 kW (TOU peak)	400	400	13.01	15	0		0
C1(c)	Supply at 400 volts- Sanctioned load 5 kW and up to 500 kW (TOU off-peak)	400	400	8.01	9.3	2		2.58
C2(a)	Supply at 11,33 kV load up to and including 5,000 kW	380	380	10.25	11	324		243
C2(b)	Supply at 11,33 kV load up to and including 5000 kW (TOU peak)	380	380	12.6	14.7	6		12.6
C2(b)	Supply at 11,33 kV load up to and including 5,000 kW (TOU off-peak)	380	380	7.75	9.2	24		34.8
C3(a)	Supply at 66 kV and above Sanctioned load above 5,000 kW	360	360	10.1	11	38		34.2
C3(b)	Supply at 66 kV and above Sanctioned load above 5,000 kW (TOU peak)	360	360	12.18	14.5	0		0
C3(b)	Supply at 66 kV and above Sanctioned load above 5,000 kW (TOU off-peak)	360	360	7.35	9.1	0		0
	Subtotal of consumption units					**436**		
	Subsidy subtotal							**354.28**

	Description	Fixed charge-NEPRA (PRs/ kW/M)	Fixed charge-MOWP (PRs/ kW/M)	Variable charge-MOWP (PRs/ kWh)	Variable charge-NEPRA (PRs/ kWh)	Sales mix (GWh)	Installed capacity (kW)*	Subsidy (PRs million)
D	*Agricultural tariffs*							
D-1(a)	SCARP	-	-	10	10	263		0
D-2	Agricultural tube-wells	200	120	6.77	8	54	14,58 3.3 *	66.42
D-1(b)	SCARP and agriculture 5 kW and above (TOU peak)	200	200	13	14.5	54		81
D-1(b)	SCARP and agriculture 5 kW and above (TOU off-peak)	200	200	8	9.1	740		814
	Subtotal of consumption units					**1,111**		
	Subsidy subtotal (due to variable cost component)							**961.42**
	Subsidy subtotal (due to fixed cost component)							**14***
A-2	*Commercial*							
	a) For sanctioned load less than 5 kW	-	-	14.77	15	689		158.7
	b) For sanctioned load 5kW and above							
	Regular	400	400	9.72	14.5	383		1830.74
	Time of Use (ToU): Peak	400	400	13.2	15	39		70.2
	Time of Use (ToU): Off- Peak	400	400	8.01	9.5	172		256.28
	Subtotal of consumption units					**1283**		
	Subsidy subtotal							**2315.69**

	Description	Fixed charge-NEPRA (PRs/kW/M)	Fixed charge-MOWP (PRs/kW/M)	Variable charge-MOWP (PRs/kWh)	Variable charge-NEPRA (PRs/kWh)	Sales mix (GWh)	Installed capacity (kW)*	Subsidy (PRs million)
	Other categories							
G	Public lighting	-	-	13.73	14.5	100		77
H	Residential colonies	-	-	12.92	13.5	5		2.9
I	Traction	-	-	11	12.5	1		1.5
K	1. AJK tariff	360	360	13.3	-	-		
	TOU peak	360	360	13.3	-	-		
	TOU off-peak	360	360	7.92	-	-		
	2. Rawat Laboratory	-	-	11.5	-	-		
	Subtotal of consumption units					**106**		
	Subsidy subtotal							**81.4**
	Total consumption units					**15,437**		
	Total subsidy (in millions)							**27,595.43**

Source: NEPRA.

* The only entry in this column is where the MoWP and NEPRA charges for capacity differ; all other entries are omitted for this column. In our calculations, where the two tariffs are identical there is no impact on TDS calculation. NEPRA determined a fixed charge of PRs200/kW/month and a fixed revenue of PRs35 million for LESCO for a year. Using this information, installed capacity is estimated to be 14,583.3 kW for LESCO. The subsidy due to fixed costs for agricultural consumers is PRs80/kW/month. Multiplying the subsidy (PRs960/kW/year) by installed capacity (14,583.3 kW), we arrive at the subsidy due to the fixed-cost component: PRs14 million for the entire year.

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