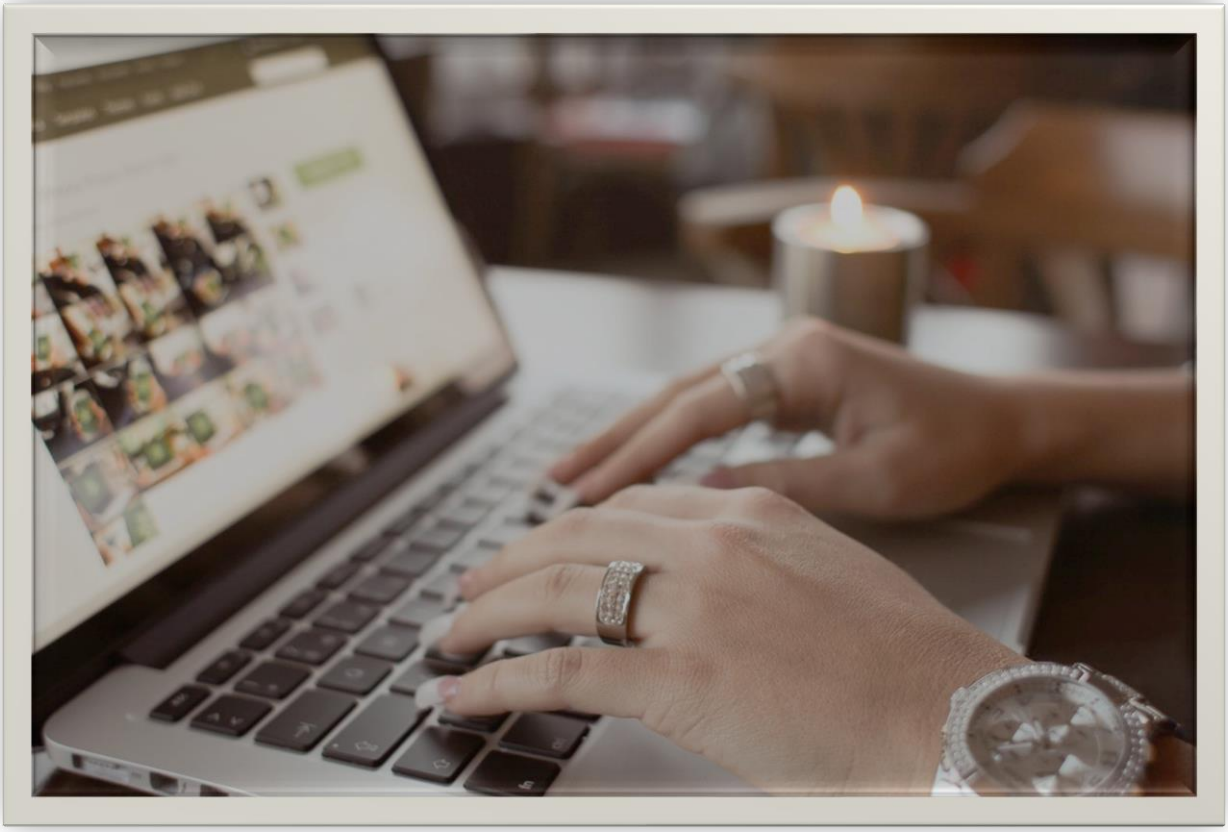
ECONOMIC IMPACT ANALYSIS OF INTERNET SHUTDOWN IN INDIA

A QUANTITATIVE ANALYSIS



A PROJECT FOR THE COURSE - INFORMATION AND TELCOM POLICY REGULATION

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1) Introduction

India has been often referred as the capital of internet shutdown with having more than 500 complete shutdowns from 2013-21. The highest number being noted in the recent year 2020 itself when number of shutdowns reached 129 as per a report by (https://internetshutdowns.in). Some of the common shutdown in our recent memories include during the protests against the government in Kashmir, growing foreign propaganda during Farmers Protest, maintain peace during violence in the West Bengal Elections. to achieving policy goals, for example by shutting down the Internet to stop students cheating in exams in states like Bihar and Jaipur (Newslaundry,2021). While the internet shutdown during all these events were done in order to protect and maintain peace and sovereignty among the nation, many reports have also classified some shutdowns as unnecessary and misuse of power. Also, ignoring the various negative socioeconomic impacts such as use of internet in availing education, health facility, financial transactions etc is also not wise. Taking these considerations, the current study tries to evaluate the socioeconomic impacts of internet shutdowns and tries to provide justification for the compensation policy for such act.

1.1 What is Internet Shutdown

According to Access now, “An internet shutdown is an intentional disruption of Internet-based communications, rendering them inaccessible or effectively unavailable, for a specific population, location, or mode of access, often to exert control over the flow of information.” This shutdown can further be explained on the basis of geography where a national level shutdown inhibits users across the entire country unable to access the Internet, or at a subnational (local) level, where mobile and/or fixed Internet access in a state, city, or other localized area is cut off (Internet Society, 2020).

1.2 Regulations on Internet Shutdown

Internet shutdown in India is governed by various laws and regulations as follows:

1.2.1 The Indian Telegraph Act, 1885 [Sub section 2 of Section 5]

In the interest of Sovereignty, Integrity, Security and maintaining friendly relations with foreign regions, the state has the right to control the transmission of messages.

1.2.2 Section 144 of the Criminal Procedure Code (CrPC)

Until 2017, the DM was authorized under Section 144 of the Criminal Procedure Code (CrPC) to issue an internet shutdown if he/she was of the opinion that such an order was likely to prevent, or tended to prevent, “obstruction, annoyance or injury to any person lawfully employed, or danger to human life, health or safety, or a disturbance of the public tranquility, or a riot or an affray.” Once issued, no mechanism existed to review the legality of the internet shutdown.

1.2.3 Temporary Suspension of Telecom Services (Public-Emergency or Public Safety) Rules 2017 [sub-rule (1) of Rule 2]

This regulation allowed the control (of transmission of messages through any telecom services only when “necessary” or “unavoidable”, during a “public emergency” or in the “interest of public safety” or in “inevitable circumstances”.

- “public emergency” is defined as “the prevailing of a sudden condition or state of affairs affecting the people at large calling for immediate action”
- “public safety” is defined as “the state or condition of freedom from danger or risk for the people at large”
- Inevitable circumstances - not defined.

1.2.4 Supreme Court 2020 - Anuradha Bhasin vs Union of India (10.01.2020)

- Usage of the Internet is the Fundamental Right under Article 19 of the Indian Constitution.
- Internet shutdowns can be of temporary period but not for indefinite period (maximum 15 days)
- Government to publish all orders imposing restrictions under Section 144.
- The Court had also said that any order with regard to Internet Shutdowns will come under Judicial Scrutiny.

1.3 Gaps in existing regulation

Through analysis of secondary Data sources (Suspension of Telecom Services/Internet and Its impact, Standing committee on C&IT 2021-22) and other sources, following gaps are identified in the present regulations governing Internet shutdown in India:

- No public consultation before enacting the Internet Shutdown law 2017
- Definition of Inevitable circumstance - clear definition of conditions in which Internet Shutdown can be imposed by the state
- Process of Review and power to reverse shutdown - No clear definition of process to be followed by review committee before and after imposing the internet shutdown
- Review period - No rationale of fixing review within 5 days of imposing shutdown
- Composition of Review committee - Non-inclusion of non-executive members in the review committee (Review is done by officials which are working under the same government).
- Redressal mechanism - No redressal mechanism to challenge internet shutdown
- Monetary compensation - No compensation for economic, social and psychological loss (TISP, Consumer, Platforms, startups etc.)
- Emergency telecom services such as Dial 100 etc. provision during shutdown
- Public Notification of shutdown - No public notifications are issued
- Natural Justice - no consultation with affected parties (TISP, People, Press, Businesses, civil society etc.)
- Sunset clause - maximum duration of shutdown.
- Central Database of Internet Shutdown - No such database is maintained by the government

2) Why is Regulatory Intervention needed in the Context of Internet Shutdown?

- Address a significant market failure - Negative externalities of Internet shutdown, information Asymmetry due to internet shutdown
- Promote certain features of a market - universal access of information is hampered due to internet shutdown
- Economic considerations - low consumer surplus, low producer surplus
- Freedom of Speech considerations

2.1 Primary Data Evidence

To perform a Regulatory Impact Assessment on Internet Shutdowns in India. The existing regulation doesn't address the economic impact of Internet shutdowns.

The scope of RIA is limited to

- There is a significant negative economic impact of internet shutdown on TISP and businesses relying on internet connectivity.

There is no provision of monetary compensation by states to TISP and businesses during state-imposed internet shutdowns.

As per Access now data, the economic impact of Internet shutdown between 2019 to 2022 is as follows:

There have been 261 major internet shutdowns in 46 countries since 2019

- $20.54 billion: total cost to the world economy of government internet outages over this period

2022: 14 internet shutdowns in 9 countries cost $3.02 billion to date

- 8,432 hours: total duration in 2022 to date of deliberate internet disruptions around the world
- Russia: most affected nation to date ($2.21 billion), followed by Kazakhstan and Myanmar.

2021: 50 internet shutdowns in 21 countries cost $5.45 billion

- 30,179 hours: total duration of deliberate internet disruptions, 11% more than the year before.
- Myanmar: most affected nation to date ($2.8 billion), followed by Nigeria and India.

2020: 93 internet shutdowns in 21 countries cost $4.01 billion

- 27,165 hours: total duration of deliberate internet disruptions, up 42% from the previous year.
- India: most affected nation in 2020 ($2.8 billion), followed by Belarus and Yemen.

2019: 122 internet shutdowns in 21 countries cost $8.05 billion

- 19,149 hours: total duration of deliberate internet outages
- Iraq: most affected nation in 2019 ($2.3 billion), followed by Sudan and India.

As per a Deloitte study, economic impact of Internet shutdowns on low, medium and high internet connectivity country is calculated as follows:

Table 1: Internet ecosystem metrics across groups of countries by Internet connectivity[1]

	Low	Medium	High
Internet penetration	<49%	49-79%	>79%
Average connection speed (mbps)	3.0	6.5	10.5
Businesses with Internet access	20%*	69-95%	78-95%
E-commerce as a % of GDP	0.3-2.3%	0.4-5.2%	0.8-5.7%
Average e-commerce size per capita	$40	$220	$1,250

*Figure 1 Deloitte Internet Shutdown (*The Economic Impact of Disruptions to Internet Connectivity:*, 2017)*

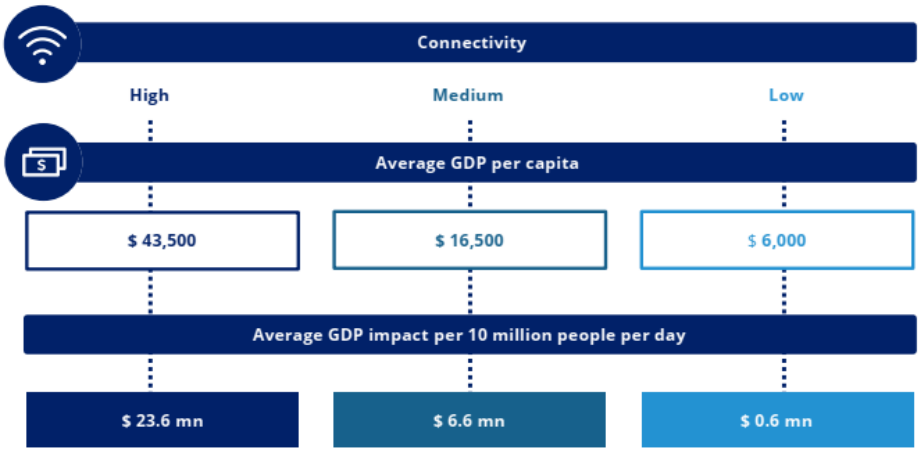

*Figure 2 Deloitte report (*The Economic Impact of Disruptions to Internet Connectivity:*, 2017)*

3) Approach of Regulatory Impact Analysis (StakeHolders)

3.1 Identification of the parties having economic impacts due to internet shutdown

- Citizens (Infotainment, Education, Health etc.)
- TISP (Telecom & Internet Service Providers)
- E- Businesses (Press, OTT Services, e-Commerce platforms etc, eduTech, HealthTech, Startups etc.)
- State

3.2 Identification of independent variables leading to economic impacts

- Time of internet shutdown (Hours/Days)
- Cost of internet data (perGB/prepaid/postpaid)
- Number of Internet subscribers who are affected
- Geography of internet shutdown (Location/state) - per capita income
- Average data consumption per user in the location/state
- Digital financial transactions in the state

3.3 Benefit Cost Analysis

3.3.1 Risk of maintaining the existing Internet shutdown regulation (Benefit to change the regulation):

- TISP and business keep bearing the loss. In absence of monetary compensation, the firms won't be able to recover the Average Variable cost (in the short run) and Average Total cost (in the long run will) and shutdown their business. To sustain, they will increase the internet/product cost. This will affect the consumer as they have to pay more for internet access. Consumer surplus will be very low.
- Consumer and producer surplus will increase

3.3.2 Risk of changing the existing Internet shutdown regulation (Cost to change the regulation):

- State has to compensate the TISP and business for the loss incurred due to the state-imposed internet shutdown. This will affect the state exchequers. State will try to recover this expenditure through extra tax etc.
- States can compensate the TSPs by reducing the levy on their revenue, by reducing the tax on e-commerce firms, by reducing financial transaction charges for financial institutions etc.

4) Data Analysis

The primary impact of Internet shutdown is on telcos, as these are the companies that provide internet services. The shutdown has a significant secondary impact on all the digital platforms and services that are dependent on internet infrastructure including the e-commerce companies, food deliveries, groceries, digital payments etc. There are other effects such as education, health, infotainment etc.

For the purpose of our analysis, internet shutdown (IS) data pertaining to India in the year 2020 is considered. There were a total 129 instances of IS in 2020 and ten states were affected as per Accessnow - Keepiton Stop 2020 data set [1]. There were 134 shutdowns in 2018 but we have considered 2020 as it can capture the most recent impact.

As per Top10VPN report[2], there were a total of 8927 hours of IS in India in 2020 and it has affected a total of 10.3 million population. This is taken as the basis for our calculation of economic impact.

The 10 states selected for our analysis are as follows:

1. Jammu and Kashmir
2. Maharashtra
3. West Bengal
4. Andhra Pradesh
5. Madhya Pradesh
6. Uttar Pradesh
7. Meghalaya
8. Manipur
9. Rajasthan
10. Arunachal Pradesh

4.1 Datasets

With these 10 Indian states in focus, 3 independent variables are considered for analyzing economic impact. The analyses of which will be individually described below. The datasets are chosen after analyzing secondary literature and reference is provided for each dataset. The dataset reflects the revenue loss of primary and secondary business due to IS.

Telco data: The first dataset comprises total data usage in the affected state and average per GB data cost to calculate total revenue loss. As per Rajat Kathuria et al, 2018 report [2], mobile internet traffic is an important indicator to calculate economic impact on the business of Telecom Service providers. The data is collected from the Telecom Regulatory Authority of India (TRAI) for the year 2020 [3].

dComm data: The second dataset comprises the number and value of digital transactions in the affected state. As per a Deloitte report 2016 [4], the economic impact of IS on state GDP is proportional to the extent of penetration of digital business in the region. All digital businesses such as e-commerce sites, online groceries, food delivery and brick and mortar outlets who accept digital payments etc. primarily depend on digital financial transactions

such as UPI, wallet, credit cards, debit cards, net banking etc. Digital financial transactions reflect the economic transactions associated with the digital platforms and hence are considered to calculate economic impact due to IS rather than taking individual data for each digital platform such as Amazon, flipkart etc. We have considered the dataset from PhonePe for the year 2020 [5] which is the market leader with ~50% market share[6]. PhonePe is served by the majority of digital platforms.

State GDP data: And the third dataset comprises State GDP data which reflects the overall economic effect of IS on the GDP of the affected state as per Brookings report[7]. The data is taken from the Reserve Bank of India for state GDP for year ending 2019 [8] which acts as base for the year starting 2020.

5) Calculating Economic Impact

5.1 Telco Dataset

Objective - To calculate the economic loss (revenue) to Telecom Service Providers due to Internet Shutdown.

Assumption - Revenue loss due to wireless internet services (3G/4G) only considered. Fixed line broadband is not considered. Only revenue loss is calculated. Net loss is not calculated.

Input Variables - Given the following variables from the dataset:

1. *No Internet users in the affected state*
2. *Average Data usage per user per month (in GigaBytes - GB) for the country*
3. *Average Wireless Data revenue realization per GB for the country*

Output -

1. *Total Revenue realization by TSP per Hour (in Rs) in 2020 in each affected state*
2. *Total Revenue Loss to TSP in affected states due to Internet Shutdown in 2020*

Calculation: -

1. Total data usage per month in 10 states in 2020 =

   No of Internet users in 10 states * Average Data usage per user per month (in GigaBytes - GB) for the country

   = 374.745 million * 11.76 GB

2. Total Data Usage per Hour (GB) in 10 states in 2020 **=**

   (***Total data usage per month in 10 states * 10^6)/ (30 * 24)***

   = 6180233 GB

3. Total Revenue realization per Hour (in Rs) in 2020 =

   Total Data Usage per user per Hour (GB) in 10 states in 2020 * Average Wireless Data Revenue realization per GB for the country

   = 6180233 GB * Rs. 10.93 = 6.66 Cr

4. Total Revenue Loss to TSP in affected states due to Internet Shutdown in 2020 =

   Total Revenue realization per Hour (in Rs) in 2020 * Hours of Internet Shutdown in 2020 * ratio of affected population to total internet users in affected states

   = 6.66 cr * 8927 * (10.3/374.745)

   1 Us Dollar = 75 Inr(2020) = $ 0.22 Billion

[Note: Refer the Appendix-I for the calculation]

5.2 dComm Dataset - Digital Commerce

Objective - To calculate the economic loss (revenue) to Digital Platforms due to Internet shutdown.

Assumption - Majority of digital platforms and brick and mortar outlets provide PhonePe option for paying for goods and services. PhonePe is the market leader for digital financial transactions with pan India coverage. The volume and value of transactions on PhonePe reflects economic activities of digital platforms. The offline transactions such as Cash on delivery and direct cash transaction at outlets are not considered in the calculation. Only revenue loss is calculated. Net loss is not calculated.

Input variables - Given the following variables from the dataset:

1. *No Transaction Per Hour in 2020*
2. *Value of The Transaction Per Hour (Rs) in 2020*

Output -

1. *Total value of Digital Transaction Per Hour in affected States in 2020*
2. *Total Revenue Loss to Digital Commerce in affected states due to Internet Shutdown in 2020*

Calculations: -

1. Total value of Digital Transaction Per Hour in affected States in 2020 =

   Sum of Value of Transaction per Hour (Rs) in 2020 of each state

   = 77 Cr

2. Total Revenue Loss to Digital Commerce in affected states due to Internet Shutdown in 2020 =

   Total value of Digital Transaction Per Hour in affected States (in Rs) in 2020 * Hours of Internet Shutdown in 2020 * ratio of affected population to total internet users in affected states

   = 77 cr * 8927 * (10.3/374.745)

   1 Us Dollar = 75 Inr(2020)

   = $ 2.53 Billion

   [Note: Refer the Appendix-I for the calculation]

5.3 State GDP Data from RBI

Objective - To calculate the economic loss (net) to state GDP due to Internet Shutdown.

Assumption - State GDP is the cumulation of multiple factors representing the formal and informal sectors and activities. In our calculation, we have considered the contribution of the Digital economy on state GDP. The contribution of the Digital economy on the country's GDP was 7.7% in 2020.

Input variables - Given the following variables from the dataset:

1. State GDP per capita in Rs in 2020
2. State Population in 2020

Output -

1. *Total state GDP Per Hour in affected States in 2020*
2. *Total Net GDP loss due to Internet Shutdown in 2020*

Calculation: -

1. Total state GDP Per Hour in affected States in 2020 =

   (State GDP per capita in Rs in 2020 * State Population in 2020)/ (365*24)

   = 924.86 Cr.

2. Total Net GDP loss due to Internet Shutdown in 2020 =

   Total state GDP Per Hour in affected States in 2020 * Hours of Internet Shutdown in 2020 * ratio of affected population to total population in affected states

   = 924.86 cr * 8927 hour * (10.3/701)

   1 Us Dollar = 75 Inr(2020)

   = $ 1.25 Billion

   [Note: Refer the Appendix-I for the calculation]

6) Conclusion -

The analysis shows an approximate USD 2.75 Billion revenue loss to Telecom and digital businesses due to Internet shutdown in 2020. It also shows a net USD 1.25 Billion loss to national GDP in 2020 due to the Internet shutdown.

6.1 Regulation

The Internet shutdown is a state matter associated with law and order, integrity and public safety. There is a significant economic impact of such shutdowns as shown by our analysis and hence Government should formulate policies to provide economic compensation due to state-imposed shutdowns in the form of reduced levies and taxes.

6.2 Limitations

1. Other Digital financial transactions such as Gpay, BHIM etc. are not considered which may have significant economic impact.
2. Total number of active users on Digital platforms are not considered
3. Sectors such as Education, Health etc. are not considered

6.3 Future Work

- Recommended amount of Levy reduction for Telcos can be identified
- Recommend GST reduction for the e commerce platform
- End user compensation by telcos can be proposed.

7) Appendix-I

Table 1 Table Caption

		PhonePe Digital Transaction Data Set 2020			TRAI Telecom Dataset 2020						State GDP (Per capita 2019-20) dataset			
S.No.	States affected due to Internet Shutdown (IS) 2020	No. of PhonePe Transaction per Hour	Value of PhonePe transaction per Hour (Rs)	Avg. value per transaction	No. of Internet Users 2020 (in Million)	Average Data Usage per user per month (GB) - 2020	Total Data Usage per user per month (Million GB)	Total Data Usage per Hour (GB)	Average Wireless Data Revenue realization per GB (in Rs)	Total Revenue realization per Hour (in Rs) - 2020	NGDP 2019-20 (Per capita) in Rs	NGDP 2019-20 (Per capita) per hour in Rs	Population 2019	Total NGDP 2019-20 per hour (in Rs)
1	Jammu and Kashmir	1459	4404721	3019	8.04	11.76	95	131944	10.93	1442148	102789	11.73	13606320	1596021 34
2	Maharashtra	125533	191688891	1527	69.01	11.76	812	1127778	10.93	12326614	202130	23.07	12314422 3	2840937225
3	West Bengal	34729	63102593	1817	35.3	11.76	415	576389	10.93	6299932	113163	12.92	99609303	1286952195
4	Andhra Pradesh	87171	191427516	2196	62.59	11.76	736	1022222	10.93	11172886	168480	19.23	53903393	1036562247
5	Madhya Pradesh	47710	87309300	1830	52.91	11.76	622	863889	10.93	9442307	103288	11.79	85358965	1006382197
6	Uttar Pradesh	57496	109299896	1901	98.68	11.76	1160	1611111	10.93	17609443	65704	7.5	23788272 5	1784120438
7	Meghalaya	284	605772	2133	1.455	11.76	17	23611	10.93	258068	87170	9.95	3366710	33498765
8	Manipur	565	1828340	3236	1.455	11.76	17	23611	10.93	258068	84746	9.67	3366710	32556086
9	Rajasthan	62053	121437721	1957	43.85	11.76	516	716667	10.93	7833170	115492	13.18	81032689	1068010841
10	Arunachal Pradesh	405	1072035	2647	1.455	11.76	17	23611	10.93	258068	169742	19.38	1570458	30435476
		417405	772176785	1850	374.745			6120833		66642636			701	9248622128

		Avg. Value of Transaction (in Cr) Per Hour in State of Internet Shutdown (IS) in 2020	77						Total Revenue realization by Telco per Hour (in Cr)	6.66			Total NGDP per Hour (in Cr)	924.86
		Hour of IS in 2020	8927						Hour of IS in 2020	8927			Hour of IS in 2020	8927
		Revenue (Loss) in Billion Rupees	6874						Revenue (Loss) in Billion Rupees	595			NGDP (Loss) in Billion Rupees	82562
		INR equivalent to $ in 2020	75						INR equivalent to $ in 2020	75			INR equivalent to $ in 2020	75
		Revenue (Loss) in Billion $ in 2020 due to IS	92						Revenue (Loss) in Billion $ in 2020 due to IS	8			NGDP (Loss) in Billion $ in 2020	1101