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Similarities yet Divergence in South Asian Macroeconomic Performance

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Abstract

Stylized business cycle facts for South Asia are both similar and different from other regions. They show the dominance of supply shocks, often amplified by macroeconomic policies and procyclical current accounts. Interest and exchange rate volatility rose initially on liberalization, but fell as markets deepened. A gradual approach to openness and market development, with flexible exchange rates, that avoided complete liberalization, worked well initially. But a combination of excessive government/foreign borrowing and inadequate reserves made it difficult for smaller countries to withstand the multiple external shocks that began with the global pandemic. Domestic ability to smooth shocks and global safety nets are both essential. India benefitted from growing diversity, evolution to countercyclical macroeconomic policy better suited to structure and a good coordination of monetary and fiscal policies, with balance between demand stimulus and continuing supply-side reforms. Reserves and capital flow management policies helped insulate from global shocks. Intervention damped excess exchange rate volatility, reducing risk premiums.

Keywords: South Asia, Supply shocks, Flexible exchange rates, Diversity, Smoothing

JEL Codes: E3, E63, O11

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1. Introduction

We review the macroeconomic performance in South Asian (SA) countries, and analyze why despite opening out at a time after which major international shocks occurred, they did reasonably well until the global financial crisis (GFC). A gradual approach that combined opening with domestic market development, while avoiding full liberalization, worked well initially. Flexible exchange rate regimes prevented overshooting and persistent misalignment. The exchange rate had to be competitive, since the region had a current account deficit. Fiscal deficits were also higher than East Asian peers.

In contrast, in 20th century Latin America, fiscal profligacy had resulted in repeated macroeconomic crises despite a variety of macro stabilization efforts. The East Asian crises of the 1990s occurred despite a fiscal surplus, because of too rapid financial liberalization, combined with policies such as fixed exchange rates that created moral hazard.

We build a set of business cycle stylized facts that identify unique features of the SA region and derive implications of structure for policy. Macroeconomic policies and procyclical current accounts often amplified dominant supply shocks. Interest and exchange rate volatility rose initially on liberalization, but fell as markets deepened.

Growth was lower for all emerging markets (EMs) under global risk-on and risk-off, following the GFC. Reserves of smaller SA countries proved inadequate under rising government and external debt and the series of external shocks following the global pandemic. Domestic ability to smooth shocks and global safety nets are both essential.

India benefitted from growing diversity, evolution to countercyclical macroeconomic policy better suited to structure, and a good coordination of monetary and fiscal policies, with balance between demand stimulus and continuing supply-side reforms. Reserves and capital flow management policies helped insulate from global shocks. Intervention damped excess exchange rate volatility, reducing risk premiums.

Similar features led to convergence in macroeconomic policies in the region – but differing political systems reduced buffers required for smoothing external shocks, causing divergence.

The remainder of the paper is structured as follows. Section 2 builds stylized facts for the region. Business cycle correlations obtained in 2.1 are used to derive an analytical framework consistent with the correlations and analyse the impact of shocks in 2.2, including shocks from openness in 2.3. Section 3 extracts patterns from a data-based comparison of macroeconomic outcomes and volatilities over the years. Section 4 turns to a narrative history of macroeconomic policies in India, first drawing out the impact of structure and shocks (4.1) and political changes (4.2) on them before analysis of the policies themselves in 4.3, debt and fiscal reform in 4.4 and monetary-fiscal coordination in 4.5. Section 5 concludes.

2. Stylized facts

2.1 Business cycle correlations

Insights from optimizing behaviour for emerging market (EM) macroeconomic cycles in the literature include Calvo and Vegh (1999), who explain the surge in Latin American consumption expenditure following exchange rate stabilization by the poor credibility of the stabilization and its expected reversal. Aguiar and Gopinath (2007) find more volatile trend growth, driven by policy instability, makes EM optimal consumption more volatile, and the current account (CA) strongly counter-cyclical. Net exports (NX) fall as output, consumption, and imports rise. If the trend is the cycle for EMs, or shocks are regarded as permanent, optimal consumption should vary more than output as expected future income also rises. In mature markets the trend is stable, so consumption is smooth.

Aguiar and Gopinath (2007) derive business cycle characteristics—volatility through the standard deviation (σ) and autocorrelation (ρ)—or degree of co-movement in time series of macroeconomic variables. Their average values for 13 EMs, excluding SA economies, and 13 developed markets are reported in the last two columns of Table 1.

We find patterns differ for SA economies when we calculate yearly time series moments[1] (quarterly data are not available). So the table compares yearly to quarterly moments. But since they were worried about measurement errors in EM quarterly data, Aguiar and Gopinath also calculated unreported yearly moments, with similar results. They restrict their data to the 1980s and '90s (patterns were different in the 1960s and '70s, when the EMs were largely closed.)

We restrict our data set to the post-liberalization era in the SA region – calendar years 1980-2007 – to avoid the atypical post-GFC shocks. Since this populous region is a source of many migrants, remittances are important. So we also investigate the cyclicality of the current account (CA). The patterns Table 1 reveals are:

1. Output (Y) volatility is relatively much higher in SA.
2. Volatility of C/I, I/Y, is much lower, implying a much higher volatility of consumption (C) and investment (I) that matches output volatility.
3. Volatility of growth rate, or log difference of output, is higher.
4. Correlation of C and I with Y is much higher: Close to 1 compared to 0.7 for other country groups.
5. Correlation of Y, Y_{-1} is higher; implying greater persistence of shocks, but that of growth rates is erratic, varying from high positive to negative. The growth correlation for India and Sri Lanka is close to that for the EM group.
6. Volatility of NX/Y is lower in India, Bangladesh, and Nepal, but higher for the others.

7. Correlation of NX/Y with Y is high positive, compared to high negative for the EM group and low negative for developed countries; that is, it is procyclical in SA[2]. Correlation of CA/Y with Y is uniformly high and procyclical.

Table 1: South Asian volatilities compared to other emerging and developed markets

	India	Pakistan	Sri Lanka	Bangladesh	Nepal	Bhutan	Emerging Markets	Developed Markets
$\sigma(Y)$	16.94	21.38	25.34	33.10	45.13	39.46	2.74	1.34
$\sigma(\Delta Y)$	3.20	2.93	2.33	1.23	2.45	1.57	1.87	0.95
$\rho(Y_t, Y_{t-1})$	0.9981	0.9991	0.9987	0.9999	0.9996	0.9999	0.76	0.75
$\rho(\Delta Y_t, \Delta Y_{t-1})$	0.27	-0.10	0.21	0.57	0.61	-0.08	0.23	0.09
$\sigma(C)/\sigma(Y)$	1	0.97	0.92	1.09	0.995	0.85	1.45	0.94
$\sigma(I)/\sigma(Y)$	1.59	1.02	0.98	1.59	1.07	1.06	3.91	3.41
σ (NX/Y)	0.72	3.46	3.32	0.43	1.55	7.96	3.22	1.02
σ (CA/Y)	0.77	2.24	2.87	6.97	0.10			
ρ (NX/Y,Y)	0.14	0.65	0.70	0.25	-0.84	0.80	-0.51	-0.17
ρ (CA/Y,Y)	0.69	0.20	0.79	0.85	0.85			
ρ (C,Y)	1	0.996	0.9999	0.998	0.9998	0.99	0.72	0.66
ρ (I,Y)	0.99	0.99	0.99	0.996	0.998	0.998	0.77	0.67

Note: The last two columns list average values of standard deviations in percentages and correlations using quarterly data for 13 developed economies and 13 emerging economies, excluding South Asia. (Source: Aguiar and Gopinath 2007). The moments for South Asian countries use annual data. All variables are HP-filtered, except growth rates (first differences of logs).

Implications from these stylized facts are:

1. Higher volatility of Y, C, I, and growth: More shocks and less ability to smooth shocks.

2. Higher C, I correlation with Y; less volatile C, I ratios: Less-developed financial markets or less wealth may be limiting C to income. Or shocks are regarded as temporary, so rather than borrowing for C, savings rise. The important point is higher C, I volatility does not drive income volatility, but follows it. Since C and I are not the source of high observed income volatility, shocks must be primarily to supply, or external, and induced demand multiplication must be coming largely from policy.

3. NX procyclical: Procyclicality can occur in two ways. First, if growth is export driven, NX would rise with output. Second, the region is dependent on oil imports. An oil price shock is deflationary, reducing output but also raising the import bill, implying NX would fall with output. If imports rise in booms the NX would be countercyclical, but if the international oil price effect dominates, imports would rise in slowdowns. The global cycle and NX is then a source of shocks. Since policy influences the CA, policy that magnifies shocks could make NX more procyclical. Remittances that rise with oil prices, and other types of economic diversity, moderate the cyclicality of the CA.

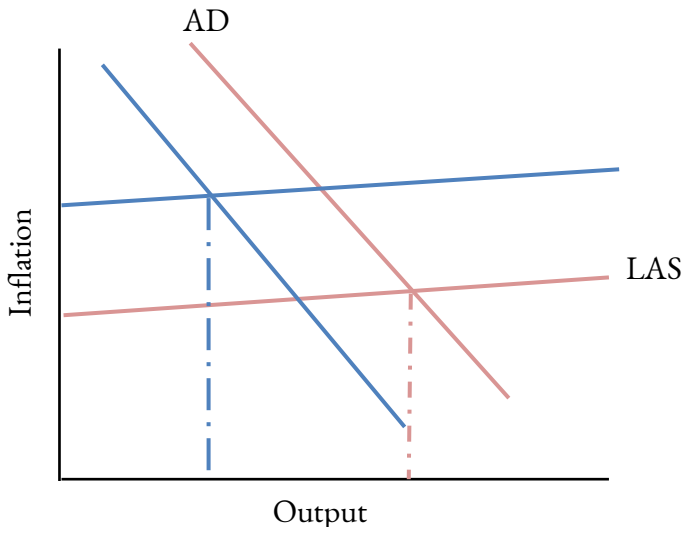
4. Correlation of Y, Y_{-1} higher; correlation of Y, growth low: More frequent as well as persistent shocks with less policy smoothing would explain this.

These patterns point to inadequate public and private ability to smooth shocks. Persistent shocks may partly be due to this inability. Supply side shocks are to be expected in oil importer economies that are still agriculture dependent, have constrained markets, and have severe infrastructural and other bottlenecks.

2.2 Structure and shocks

A simple analytical framework consistent with these stylized facts is developed and used to examine the effect of shocks and openness. During a catch-up period of high growth, as a large labour force shifts to more productive occupations, longer-run aggregate supply (LAS) is elastic (Figure 1), but frequent adverse supply shocks push it upwards. Cost shocks and inflationary expectations raise prices over all current output ranges, rather than only at full employment. If labour mobility is high, this provides a better framework of analysis compared to traditional two-sector dual economy models. The LAS becomes vertical only as the economy matures and full productive employment is reached.

Figure 1: Aggregate demand and supply



In India, monsoon failures or international oil price shocks have been dominant inflation triggers. Propagation mechanisms such as governance failures convert these into low chronic cost-push inflation (Goyal 2012). For example, political pressures from farmers push up farm support prices, with consumption subsidies also going up. But these are inadequate due to corruption and failures of targeting[3]. Since food has a large share in the consumption basket, nominal wages rise with a lag, pushing up costs and generating second-round inflation from a temporary supply shock. Political support also raises wages through minimum wages and employment schemes[4]. If monetary tightening

pushes the demand curve leftwards along a flat supply curve, the cost in output sacrifice is high, with little impact on inflation. It is the upward creep in the supply curve that affects the latter. But as fiscal populism increases demand, money supply is often tightened as an offset.

Such a framework would explain high and persistent output volatilities, as policy choices aggravate output contractions in response to frequent supply shocks. The procyclical CA is the result of one of these frequent shocks—international oil price fluctuations.

Empirical tests support the elastic long-run supply and the dominance of supply shocks. They demonstrate endogenous amplification of supply shocks, with further upward shifts, through reductions in demand during growth slowdowns (Goyal, 2015). Results generalize to SA countries that share the crucial feature of high productivity growth releasing labor, thus allowing an elastic supply response.

But strategies to fight inflation can be designed within this structure. A cost shock creates a short-run tradeoff between inflation and output variability. Instead of relying solely on monetary tightening to bring down inflation, more nuanced policies that shift down the supply curve are feasible. For example, exchange rate appreciation, or fiscal measures such as tax-tariff rates and freer imports. Early tightening towards a positive real rate (signaling further response as required) can anchor inflationary expectations, and prevent the second-round wage-price spiral without a sharp demand contraction. Greater interest and exchange rate flexibility make more monetary policy options available.

The labour market structure implies output is below potential. If food prices are stable, capital is available, specific bottlenecks are alleviated, and institutional reforms undertaken, supply is not a constraint on output.

2.3 Openness

Openness after liberalizing reforms led to a rise (and fluctuations) in capital flows, which were a new source of shocks. But sequenced partial capital account liberalization and flexible exchange rates can give some degrees of freedom for monetary policy. Deep markets are a pre-requisite for more complete capital account convertibility.

More flexible exchange rates aid smoother and more counter-cyclical interest rates. Some exchange rate volatility induces hedging to reduce currency risk, but excess volatility raises country risk, expected depreciation, and interest rates. While limited volatility develops markets, high volatility encourages greater entry of noise traders and more speculative activity.

Thin markets require intervention to maintain volatility within bounds. But too predictable or unidirectional movements encourage speculative positions. Variation in a 10-band is sufficient to make such positions unattractive, since potential losses from an incorrect position become large. But large foreign exchange (FX) reserves and strategic intervention capabilities are required to sustain market confidence.

Limited volatility is consistent with maintaining a trend competitive real effective exchange rate. There is evidence such volatility does not have a large effect on trade, while excess volatility affects

trade adversely. If crises are avoided, interest rates lowered, and the longer-term exchange rate kept near competitive rates, trade is benefited.

In open economies with a large share of imported consumer goods, the exchange rate can be the fastest transmission channel to consumer prices. In South Asia, oil imports – which have a high pass through of exchange rate changes – dominate. As border prices begin to affect domestic food prices, the exchange rate becomes important for the domestic political economy. An appreciation when border prices rise can reduce the political pressures that raise agricultural procurement prices, and abort a rise in wages. This is one way of smoothing external shocks.

Appreciation when there is a negative supply shock, lowering intermediate goods (oil) and food prices, differs from fixing the exchange rate to bring down high levels of inflation – which led to real appreciation and often ended in a crisis in Latin American exchange-based stabilization episodes. Two-way movement only pre-empts the effect of temporary supply shocks on the domestic price-wage process. An exchange rate policy that lowers food price inflation reduces the necessity for subsidies and administered prices that distort incentives and lower efficiency. A rule-based automatic response to a supply shock avoids the tendency to do nothing until it becomes necessary to over-react. Actions linked to exogenous shocks also avoid moral hazard.

Nominal changes can counter temporary shocks as part of smoothing excess exchange rate volatility. But permanent shocks require productivity improvements. Without a rise in productivity, real appreciation would occur through inflation, requiring nominal depreciation as correction.

Thus, an exchange rate regime can stimulate the real sector, support external balance over the long run, lower inflation, and reduce FX market risks (Cordon, 2002). Lower inflation increases the Central Bank's ability to support the growth required to create adequate productive employment for SA countries' large populations.

3. Macroeconomic outcomes: Volatilities in open economies

Liberalizing reforms were meant to make the supply-side more robust and less sensitive to relative price shocks. The comparative picture of key macroeconomic variables for SA economies over the years in tables 2 (a, b) and 3 (a, b) shows the general similarities in the region: all the countries tended to have double deficits. India's foreign exchange reserves were the highest, but all the countries held reserves, and all had flexible exchange rates (Tables 3 a, b), pointing to some kind of managed float.

Table 2a: Selected economic indicators for South Asian countries

(2007, percent of gross domestic product unless otherwise noted)

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
GDP per capita ($)	350.1	486.8	1,664.8	1,028.7	3,470.5	390.8	910.0	1,616.1
GDP Growth	11.5	6.4	17.0	9.0	7.6	2.6	6.8	6.8
Inflation	13.0	7.2	5.2	4.7	7.4	6.4	7.8	15.8
Fiscal Balance	(1.8)	(3.2)	(3.4)	(5.4)	(7.8)	(2.0)	(4.3)	(7.7)
Current Account Balance	0.9	1.4	10.5	(1.5)	(40.1)	(0.1)	(4.8)	(4.2)
Gross International Reserves (month of imports)	3.6	3.3	12.9	15.0	3.1	8.9	4.5	2.9
Money Supply (M2)	21.6	45.3	59.5	85.2	73.8	54.4	50.6	39.2
Bank Deposits	10.9	39.5	46.0	68.0	64.9	29.9	79.4	65.3
Government debt	18.9 (2006)	39.40	81.4	56.4	53.1	56	51.2	76.7
External debt	3.6	3.3	12.9	15	8.9	3.1	4.5	2.9
Foreign investment	5.4	2.7		5.2	8.01		6.1	2.3

Note: ( ) = negative

Sources: Statistical appendix and note a, ADB Key Indicators for Asia and the Pacific 2008. http://www.adb.org/Documents/Reports/South-Asia-Economic-Report/2009/chap2.pdf. Government debt: CIA World Factbook; External debt: www.adb.org

Table 2b: Selected economic indicators for South Asian countries

(2020, percent of gross domestic product unless otherwise noted)

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
GDP per capita ($)	516.87	2233.31	3009.92	1910.42	7282.36	1139.19	1322.32	3893.84
GDP Growth	-2.35	3.45	-10.01	-6.60	-33.49	-2.37	-1.27	-3.47
Inflation (CPI)	5.61	5.69	5.63	6.62	-1.37	5.05	9.74	6.15
Fiscal Balance	-2.24	-4.80	-1.90	-4.65	-23.5	-3.37	-7.10	-10.53
Current Account Balance	-15.57	0.32	-16.39	1.23	-35.43	-0.25	-0.22	-1.27
Gross International Reserves ($mn)	0.28	193.11	6.55	5419.54	6.92	23.02	0.17	68.92
Broad Money	37.21	57.76	100.87	87.91	71.89	117.75	54.55	.....
Bank Deposits	17.96	48.64	90.43	74.97	61.19	103.11	36.91	92.73
Government debt	7.40	18.75	117.33	47.13	121.4	39.05	73.53	92.40

External debt stock % GNI	14.97	18.88	139.78	21.47	100.50	23.37	39.24	71.55
Foreign Direct Investment (net inflows)	0.06	0.41	-0.12	2.41	11.76	0.38	0.68	0.51

Source: Data from World Bank Data, Fred Economic data, IFS, CEIC website and Trading Economics

Table 3a: Averages and volatilities of inflation, exchange and interest rates

		Change in spot bilateral USD exchange rate	Inflation (WPI)	Call Money Rate	Long interest rate
India	**1981-92**				
	Average	10.7	8.1	11.3	16.8
	Standard dev	7.4	3.3	3.6	0.8
	1992-99				
	Average	8.5	7.2	10.2	15.2
	Standard dev	6	3.1	3.7	2
	1999-2007				
	Average	1.2	4.9	6.5	11.6
	Standard dev	4.9	1.3	1.7	0.8
Sri Lanka	**1981-92**				
	Average	8.5	11.3	19.3	14.6
	Standard dev	4.2	11.8	4.1	3.4
	1992-99				
	Average	7	7.9	22.9	17.3
	Standard dev	2.9	5.9	8.5	2.2
	1999-2007				
	Average	6.3	7.8	13.6	13.4
	Standard dev	5	7.5	7	3.3
Pakistan	**1981-92**				
	Average	8.2	8.1	7.7	9.1
	Standard dev	5.5	2.8	1.2	1.4
	1992-99				
	Average	9.6	10.2	10.2	10.9
	Standard dev	3.8	5	1.7	4
	1999-2007				
	Average	3.9	6.4	6.5	5.7
	Standard dev	6.4	2.2	2.8	2

Note: The long interest rate reported in the last column is Commercial Lending Rate-Prime for India, Minimum Unsecured Rate for Sri Lanka, and Government Bond Yield for Pakistan

Table 3b: Averages and volatilities of inflation, exchange and interest rates

		Change in spot bilateral USD exchange rate	Inflation (CPI)	Call Money Rate	Long interest rate
India	**2007-2013**				
	Average	5.44	9.43	9.22	8.09
	Standard dev	12.67	1.82	3.48	0.44
	2013-2021				
	Average	3.77	5.48	6.40	7.46
	Standard dev	5.52	2.06	1.97	0.83
Sri Lanka	**2007-2013**				
	Average	2.88	9.89	10.95	10.58
	Standard dev	4.72	6.77	3.12	1.67
	2013-2021				
	Average	5.26	4.93	7.24	11.80
	Standard dev	5.55	2.02	1.36	4.58
Pakistan	**2007-2013**				
	Average	8.74	11.96	11.00	11.89
	Standard dev	9.65	4.39	1.49	1.35
	2013-2021				
	Average	7.26	6.68	7.92	9.26
	Standard dev	9.32	2.93	1.82	2.26

Note: The exchange rate for India is calculated from the RBI database. Sri Lanka & Pakistan's exchange rate are calculated from the IFS database.

The period ending 2007 showed the culmination of reform efforts and of strong global growth. With some exceptions, growth rates were respectable and inflation rates moderate in 2007 (Tables 2a). Inflation, exchange rate depreciation, and interest rates had fallen in the 2000s compared to past decades (Table 3a). Tables 3 (a, b) report averages and standard deviations of exchange rate depreciation[5], inflation, and short and long interest rates for 3 countries.

Inflation, currency depreciation and interest rates all rose after 2007, with global volatility as a consequence of the GFC (Table 3b). Comparing 2007 with 2020 (Tables 2a and b) shows a sharp fall in reserves cover for the smaller countries, while Indian reserves had become substantial. Government and external debt rose strongly in Sri Lanka and Pakistan. This reduced their ability to smooth external shocks. Easily available but non-transparent infrastructure loans from China, as well as a larger share of commercial international government borrowing, contributed to this rise[6].

In the years of successive global shocks 2007-2013, inflation and interest rates rose. They fell as international fuel oil prices collapsed in 2014, but not enough to revive growth. Rising country risk premium kept rates higher in the smaller countries.

Prior to the liberalizing reforms, administered price and quantitative interventions repressed markets and kept volatility low, in a fragile equilibrium that broke down under large shocks (such as the external crisis in 1991). In the first reform decade, as controls were gradually lifted and markets freed, volatility increased. Although openness was itself a source of shocks, it increased diversity; together with the deepening of markets, this reduced volatility.

The pattern shows up clearly in ten-year moving averages of both average and standard deviation (Table 3a). There is an initial low, then a rise and fall pattern in volatility – reflecting the shift from restraints to markets and openness, with development of markets and institutions bringing fluctuations down by the third decade. In good times, volatility is generally low, as there are fewer external shocks; in deep markets also volatility is low.

The smaller SA countries tend to be more open, and were more strongly affected by external shocks. They had less market and capital account controls, and more government and international debt. Nepal also had the up-down pattern; Bangladesh had a steady downward trend. In Pakistan and Sri Lanka, internal unrest and political instability vitiated the pattern.

Over 1996-2003, average interest rates rose sharply, and their volatility exceeded that of exchange rates, partly due to the East Asian crisis and the use of interest rate defense. The volatility of capital flows was less than that of the current account deficit[7], since procyclical policies aggravated the latter. Initially, policy magnified shocks from openness instead of smoothing them.

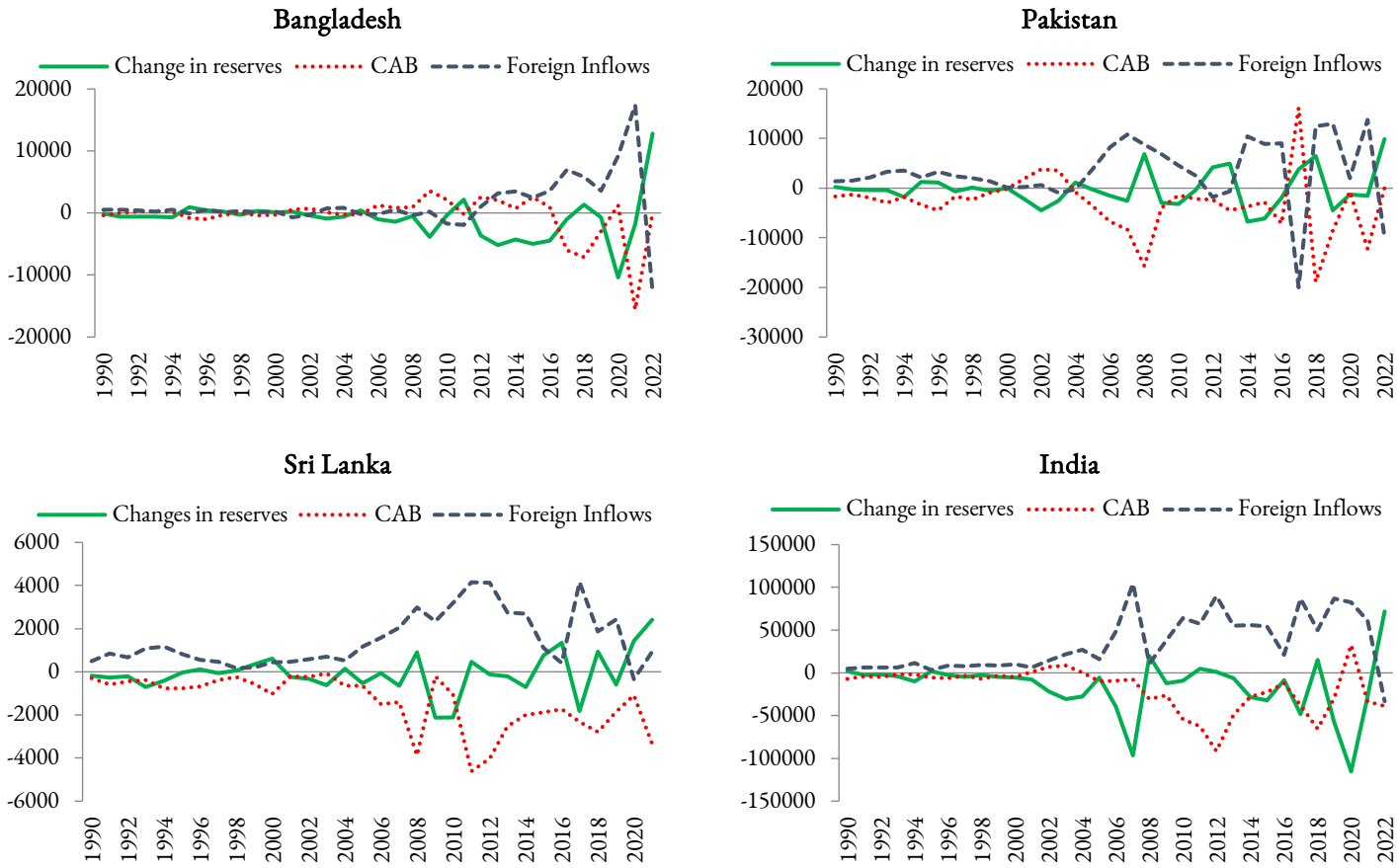
Less effective democratic pressures in Pakistan and Sri Lanka may have contributed to higher average inflation and depreciation there. Despite similar low per capita incomes, more volatility of inflation seems to have been acceptable than in democratic India, as Table 3 and the experience with the 2000s international food price shocks suggests.

The region was severely impacted by food and oil price shocks over 2007 and 2008. With political instability, capital outflows, and low reserves, Pakistan had to turn to the IMF for a rescue package. The sharp rise in interest rates imposed led to growth becoming negative (from an impressive 7%) over 2000-07. The international rise in food grain prices was passed on, contributing to double-digit inflation. But inflation dropped to low single digits by 2009[8]. In India also, procurement prices were raised, albeit not by as much; food price inflation was lower (but more persistent) as the price support system prevented domestic prices from falling when international prices fell.

The post-GFC period found the entire region more vulnerable. Deficits had widened. Indian public sector banks had been pushed to lend to private firms for infrastructure as part of the post-GFC global stimulus. The asset liability mismatch led to large non-performing assets. India embarked on a painful reform process, reduced the current account deficit (CAD) and built-up reserves.

Bangladesh's sterling export performance improved its external parameters. But none of the smaller countries were able to build sufficient reserves to withstand outflows in the pandemic-induced volatility (Figure 2). Government and external debt rose steeply in Pakistan and Sri Lanka (Table 2 a, b). The similarities of the earlier period gave way to divergences, as depreciation and interest rates in these countries exceeded Indian rates after 2013 (Table 3b).

Figure 2: External sector performance



Even as supply-side reforms continue to reduce domestic shocks, countercyclical policy must become feasible to smooth external shocks before the capital account can be made more fully convertible. Post-pandemic India came closest to fulfilling these conditions.

4. Macroeconomic Policies: Influences and Analysis

The stylized facts, structure, and experience corroborates the large impact of demand on output, the frequent supply shocks, and the importance of smoothing these. Policy analysis and narrative history for India goes more deeply into the structure, shocks, and politics that built in perverse incentives, the struggle to escape, and recent successes. Issues of monetary-fiscal coordination and sustainable debt and deficits are also explored.

4.1 Economic structure and shocks

India has a large population at low per-capita income levels. Therefore, poverty ratios and the share of food in the average consumption basket are high. The post-World War II control regime continued to target accelerated equitable development, according to the ideas of the time. But job growth was

low, due to the largely closed import substitution regime and controls that turned industry to rent seeking.

The early seventies saw severe oil shocks and sharp peaks in inflation, which hurt the poor. Since the latter were a large vote block, several user charges were kept fixed. Low price caps for many public goods resulted in systematic incentives to lower investment in and quality of public services, and to other distortions. Falling efficiency and rising costs compounded the problem of low user charges, and prevented a natural fall in prices from improvements in technology and organization. However, where the government had monopoly power and was servicing the rich, prices were raised much above costs of production. Indirect charges such as the prices of intermediate goods, not obvious to voters, were raised. As the rich turned to private providers, revenue losses contributed to the inability to service the poor adequately. Cross-subsidization was no longer sufficient to cover costs.

Populist fiscal response to supply shocks had a cumulative effect in trend worsening of public finances and growing public debt. The government began borrowing to finance current consumption in 1980-81, and was never able to return to a revenue surplus. Policies set in place vicious self-sustaining dynamics by creating favoured constituencies or interest groups.

4.2 Political and administrative changes

Political fragmentation made matters worse. As the Congress Party lost dominance in the 1970s and intense multi party competition set in, populist schemes multiplied, although targeting was poor. Waste and corruption proliferated. With multiple competing parties, swing votes became very important for winning in the first-past-the-post system. Poverty, caste, religious and regional heterogeneity encouraged use of identity politics to cultivate swing voters.

Frequent elections (after state elections were separated from those at the Centre in 1971) kept this pressure up continually. The democratic empowerment of the poor was a positive and necessary development, but symbolic gestures and handouts dominated in the poor Northern States. In the South, an older mass movement that emphasized education achieved progressive reform.

Administrative choices amounted to protecting the poor through current transfers, rather than building their assets and human capital, when it was the latter that was the sustainable option. Under pessimistic growth projections, this was a rational social outcome, because rich voters could often escape long-term deterioration and the poor had high discount rates so were focused on the present.

As fund constraints appeared, it was easiest to postpone investment plans. The financial sector was repressed with an administered interest rate structure. Large statutory liquidity requirements helped meet government borrowing requirements. Such quantitative measures restricted money supply growth despite automatic financing of government deficits. Interest rates were high, and many administered prices kept artificially low, but with a chronic upward bias.

The Government intervened in the food economy to ensure food security as well as to give incentives to farmers – who were also an important vote block, concentrated in a few States.

Procurement prices were often raised, while consumers were subsidized through a leaky public distribution system. The price gaps and costs of storage contributed to a mounting subsidy burden.

4.3 Macroeconomic policy

Early macroeconomic policy was geared to support planned expenditures. Since the seventies, dominant development ideas changed to favour openness. In India also, the ill-effects of controls were becoming obvious. Some liberalization started in the mid-'80s, but a major thrust for external openness came from a balance of payment crisis in the early '90s.

Post-reform macro-stabilization included a cut in public investment and monetary tightening, partly to sterilize capital inflows. Throughout this period, gradual financial reforms deepened markets. As most interest rates stopped being administered, it became a more effective policy instrument.

With the implementation of the liquidity adjustment facility (LAF) in 2001, policy was largely successful in keeping call money rates between the LAF bands determined by the repo and reverse repo rates, which began to be changed frequently and smoothly. There was steady reform also in Indian foreign exchange (FX) markets, and some two-way rupee movement in the 2000s after steady depreciation through the '90s.

The RBI now had more independence, with no automatic monetization or devolvement of primary issues of government securities. The fiscal deficit fell after a long time, with higher growth and lower interest rates, when the opposite policy of periodic rise in interest rates had not succeeded in reducing deficits over 1997-02. This lowering, however, did not occur from conscious policy choice, but because international interest rates were falling.

Inflation rose after severe international food price and oil shocks (2007-08) prompted a steep monetary tightening despite slowing industrial output. The GFC worsened the industrial slowdown. While a rapid monetary-fiscal response as part of the concerted global stimulus helped create a V-shaped recovery, stimulus was continued too long despite high food and consumer inflation. Regulatory softening hid risks building up in public sector banks.

As the Euro-debt crisis of 2011 and the taper tantrum of 2013 hit India and outflows threatened, over-tightening was the reaction to the earlier over-stimulus. As a result, growth slowed. For most EMs, global risk-on and risk-off resulted in much slower growth in the 2010s compared to the 2000s. Low growth prevented effective fiscal consolidation despite strong efforts.

Supply-side reform continued, however, and was better targeted at feasible technology-enabled changes, in line with India's comparative advantage. After initial attempts, the politically contentious land-labour-farm reforms, that are a favourite of foreign capital, were left to competition among states. Inflation targeting was formally adopted and strictly implemented. Since the focus was on structural reforms, however, smoothing was neglected. Regulatory over-reaction and absence of

liquidity support aggravated problems in non-bank financial companies, leading to a collapse in credit in 2019.

Monetary policy had begun correcting before the pandemic and was supportive through it. Regulatory remissions were now time-barred, creating better incentives. The financial sector had strengthened and was able to contribute to the stimulus. Macroeconomic policy found the correct balance between demand and supply-side measures. Over-stimulus was avoided. Intervention prevented excessive exchange rate volatility despite outflows, while domestic inflows kept stock markets stable. Increasing economic diversity helped absorb shocks. For example, a rise in service exports and remittances helped compensate for a slowdown in export growth. Robust recovery made India one of the best-performing economies in this dismal period.

4.4 Sustainable debt and fiscal reform

High government and external debt proved to be the Achilles heel for the smaller SA economies during the pandemic. In India also, government debt ratios were higher than its East Asian peers; however, sequenced capital account liberalization had limited external debt.

Reforms repeatedly aimed to improve fiscal health. But a norm of political populism had set in, where inclusion was sought through short-term transfers. The 2003 Fiscal Responsibility and Budget Management (FRBM) Act was not designed to protect investment, so productive expenditure was cut to continue populist spending. This was especially so for states that had limits on their borrowing. Targets were mechanically achieved, compressing essential expenditure on infrastructure, health, and education, so public services deteriorated.

Given fiscal populism, cost creep, and political sensitivity to inflation, the RBI was often forced to tighten. Moreover, interest elasticities were thought to be low, due to a large subsistence sector little impacted by interest rates. The impact of recently-freed interest rates on elasticities, in particular on consumer durable spending, housing, etc. was not yet fully understood.

Higher growth over 2003-08 did reduce debt levels, but large procyclical revenue expenditures moderated deficit reduction. Indian private savings are high enough to cover for some government dissaving, thus mitigating the CAD and currency risks, but a permanent rise in expenditure – in excess of taxing capacity – can lead to instability (Goyal 2011). A large fiscal stimulus given during the GFC was not reversed for a number of years.

Since catch-up growth was volatile and had fallen in the 2010s, debt ratios did not reduce adequately. This was despite strenuous efforts at fiscal consolidation, after outflows threatened with the Euro-debt crisis, and the election of a central government committed to fiscal conservatism.

Higher growth raises the denominator of ratios as well as revenues. Ratios shot up in the pandemic year, despite limited and targeted fiscal stimulus, since growth was negative at -6.6%. But consolidation resumed the very next year, helped by a good growth recovery, reduction in deficits, and shift in the composition of government expenditure towards investment. The latter improves human

and physical capital, and therefore the supply response. Continuing improvement in tax rates, structure, and administration, as well as higher growth, contributed to tax buoyancy. Better incentives were created for compliance of state governments.

4.5 Monetary-fiscal coordination

The post-90s-reform Indian macro policy combination was largely fiscal loosening and monetary tightening. Adverse consequences inevitably followed in a framework such as Figure 1, where demand contraction has a large effect on output and little on inflation. The period of double deficits after the GFC created monetary dominance and over-tightening.

With SA's structure and shocks, fiscal action is more effective against inflationary supply-side shocks. Also, the interest sensitivity of demand is high, with a youthful population at the borrowing stage of its life-cycle. Since each affects the other's objective, the ideal combination is a conservative fiscal policy and pro-growth monetary policy (Goyal, 2018).

The post-pandemic period demonstrated the benefits of such coordination. As deficits were reduced and effective supply-side fiscal action lowered inflation, monetary policy was able to keep real interest low and near equilibrium level. The commitment under inflation targeting (to raise rates if inflation exceeded the tolerance band) made monetary policy credible. It helped anchor inflation expectations, and kept inflation largely within the tolerance band, despite supply chain snarls and geopolitics-related commodity price shocks. Higher growth helped fiscal consolidation.

5. Conclusion

Stylized facts show the dominance of supply shocks, amplified by openness and procyclical macroeconomic policy. In India, the pandemic period demonstrated the feasibility and utility of a smoothing policy response through better coordination between monetary and fiscal policies, together with cost reduction through pragmatic reforms. Such contextual policy that avoids extremes is more suited to SA structure and to the process of change. Shocks continue to be large and frequent, but growing economic diversity, steady market development, countercyclical macroeconomic policy, and use of buffers are helping absorb shocks without reducing growth.

Transferring its large labour endowment to more productive work can be a major strength for the SA region. This reduces the risk from government debt and deficits, as long as government expenditures enable the supply response from the large numbers willing and able to work.

While in a low-growth environment, indirect benefits maybe discounted because of their uncertainty and greater chance of going to others, voters nonetheless prefer being equipped to make use of opportunities, especially as these accelerate. There are signs of this in India, but policies need to improve to more fully energize the individual and the society, even while protecting vulnerable sections.

Apart from geopolitical tensions, a major risk is populism that continues to offer freebies, especially in states. This reduces resources for improving essential public services. Although limits on state borrowing prevent macroeconomic instability, they imply higher share of government consumption expenditure must be at the expense of investment.

The smaller countries in the region were also doing well until the GFC. But the inability to self-insure against continued global shocks and the lure of easy debt aggravated political fragilities. Better global safety nets, debt resolution, and fiscal discipline are essential for EMs trying to navigate today's choppy seas. With the focus on climate change, debt-for-nature swaps, for which better measurement and transparency is a prerequisite, hold promise as a way of restructuring debt.

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Notes

[1] The data are smoothed using the Hodrick-Prescott (HP) filter to remove short-run fluctuations. For quarterly series 1600 is used as the smoothing parameter. Since yearly data are observed only one-fourth as often as quarterly data, the value used is $1600/4^4 = 6.25$. Critical correlations were also calculated with unfiltered data and with 100 as the smoothing parameter, with similar results.

[2] Exceptions are very low countercyclical for India (-0.03 with a smoothing parameter of 100), and very high countercyclical for Nepal.

[3] After his visit to Kalahandi in Orissa, the late Rajiv Gandhi said only about 15% of money meant for the poor actually reaches them. A Supreme Court panel passed severe strictures on the public distribution scheme in 2010, corroborating this assessment.

[4] There is no problem if average wages rise with agricultural productivity. But the push to minimum wages, without the latter, under the national rural employment guarantee, may have contributed to the rise in consumer price inflation over 2007-2013.

[5] It is calculated as the percentage change in average monthly local currency/USD rates.

[6] News reports put share of Chinese loans in external debt at 20% for Sri Lanka's, 30% for Pakistan and 7% for Bangladesh in 2023. Negotiating urgently required IMF loans became difficult since China would not agree to the restructuring that was an IMF pre-condition.

[7] The coefficient of variation of the CAD was –1.97 compared to only 0.19 for foreign inflows.

[8] In Sri Lanka inflation fell from 28.2 per cent in June 2008 to 4.8 per cent at end 2009.

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Construction of a Composite Indicator for Debt Sustainability Analysis
A Case of Sub-nationals in India

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Abstract

The size of fiscal deficits and sustainability of public debt levels remain a key macroeconomic policy problem in all emerging economies following the global financial crisis of 2008-09. In addition, the COVID-19 pandemic poses a considerable challenge to fiscal sustainability in developed and developing countries. Although the sustainability of public finances has been discussed for more than a century and studies have proposed several methods to define and assess debt sustainability, it remains an imprecise concept. This study proposes a new framework for public debt sustainability analysis by constructing a composite indicator, that is, a debt sustainability index. We emphasise the need for an explicit conceptual framework for constructing a composite index and usefulness of multivariate statistical analysis prior to the aggregation of individual indicators. The proposed approach can be used to analyse the debt sustainability of state governments (sub-nationals) in India.

Keywords: Composite Indicator, Debt Sustainability Analysis, Principal Components and Factor Analysis, Sub-sovereign Debt

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[#] Disclaimer: The views expressed in this paper are those of the authors. They do not purport to reflect the views or opinions of the institution to which the authors belong.

1. Introduction

Public debt vulnerabilities have increased globally in the aftermath of the global financial crisis, and this has highlighted the importance of prudent fiscal and debt management strategies for preventing financial shocks to the country. The build-up of debt substantially accelerated in developing countries following the severe COVID-19 pandemic shock.

Rising public debt levels have limited the ability of countries to mobilise resources for achieving sustainable development goals. With a rise in public debt levels, governments are likely to spend more on debt servicing and less on public goods, such as health, education, and infrastructure. A sustainability analysis of trends in primary surplus and growth–interest rate differentials can provide insights into the fiscal health of governments. In addition, the cost and risk characteristics of debt stocks can be considered for determining the stability and sustainability of public debt.

Debt sustainability analysis can help to assess the financial health of governments. The sustainability of debt requires governments to be both solvent and liquid, which refers to a country's ability to service all accumulated government debt at any point in time. The trade-off between the cost and risk of debt stock is crucial in debt sustainability analysis.

The government mainly functions as a service provider for the common man. Thus, both the inflow (revenue) and outflow (expenditure) of funds would be observed. However, the government is mostly in a deficit (higher expenditure than revenue) and to overcome extra expenses, the government borrows from the market by floating various securities, such as dated securities and treasury bills. The debt management strategy of the government is based on the principle of maintaining the public debt level within sustainable limits, and follows prudent debt management practices. The objective of the government is to reduce debt service burden and create fiscal space for economic development while minimising rollover risk[1].

In the context of India, debt sustainability analysis assumed importance during the late 1980s, when considerable fiscal deterioration occurred at the national and sub-national level. However, the majority of studies on debt sustainability in the Indian perspective have focused on central government finances or state finances only at a consolidated level. Because the constituent states of the Indian Union are highly heterogeneous in terms of their economic size, a state-specific assessment and comparison of debt sustainability status is required.

Different approaches have been employed to assess debt sustainability. The three common approaches are the analyses of the Domar debt stability condition, sustainability indicators, and present value budget constraints.

- According to the Domar debt stability condition, the growth of an economy must exceed the real interest rate.
- In the analysis of sustainability indicators, sustainability is evaluated with the consideration of different revenue and capital account parameters.

- The analysis of value budget constraints involves determining whether future surpluses are adequate to meet the current stock of debt.

This study contributes to the existing literature by proposing a composite debt sustainability index that can be used to evaluate debt sustainability. In addition, this index can be employed as a benchmark to measure the performance of the government and compare the performance of different governments or countries in terms of debt sustainability.

The remainder of this paper is organised as follows. Section 2 presents the literature review on different approaches used to analyse debt sustainability and discusses the literature available in the Indian context. Section 3 presents statistical methods used to construct the composite indicator. Section 4 discusses the empirical and analytical results. Section 5 concludes the study.

2. Literature Review

Studies have mainly used three approaches to analyse debt (fiscal) sustainability. In the pioneering work on debt sustainability based on post-Second World War US data, Domar (1944) reported that the primary deficit path can be sustained as long as the real growth of the economy remains higher than the real interest rate. Credit worthiness and liquidity indicators are considered in the analysis of sustainability indicators (Miller, 1982; Buiter, 1985, 1987; Blanchard, 1990; Buiter et al., 1993). In the analysis of present value budget constraints (Cuddington, 1999), debt sustainability is evaluated by the econometric testing of the validity of the present value of budget constraints.

Studies have examined the sustainability of public debt in the global context (Hamilton and Flavin, 1986; Trehan and Walsh, 1988; Wilcox, 1989; Bohn, 1998; IMF, 2002; Afonso, 2005; ADB, 2010). Debrun et al. (2019) performed a detailed survey on the practical aspects of debt sustainability assessments.

The sustainability of India's budget imbalance and public debt has been examined extensively at the national level (Parker and Kastner, 1993; Cashin et al., 2001; Reynolds, 2001; Jha and Sharma, 2004; Goyal et al., 2004; Rangarajan and Srivastava, 2005; Mohan et al., 2005; Buiter and Patel, 2006; Kannan and Singh, 2007; Topalova and Nyberg, 2010). The majority of the recent studies addressing the problem of public debt sustainability have demonstrated that the fiscal stance of the central government is unsustainable with regard to the future path of the public debt-to-GDP ratio (Akram and Rath, 2021).

Fiscal deficits and their implications for public debt sustainability at the subnational level in India have received considerably less attention, with some exceptions – Dholakia et al. (2004), Goyal et al. (2004), Rajaraman et al. (2005), Nayak and Rath (2009), Misra and Khundrakpam (2009) and Makin and Arora (2012). However, most of these studies have focused on subnational debt at the consolidated level.

Kaur et al. (2018) and Misra et al. (2021) have surveyed the up-to-date literature on debt sustainability analysis at the subnational level in India, and used the traditional indicator-based

approach and empirical exercises. Most of the studies on this topic have limited their analysis to conventional debt sustainability.

In this context, this study aims to contribute to the literature on India's fiscal performance at the subnational level by constructing a debt sustainability index, a sound composite indicator based on different fiscal or debt indicators to assess the stability and sustainability of public debt. The proposed index can be used as a benchmark to measure and compare the performances of each sub-national units in terms of debt sustainability. Moreover, this index facilitates to gain a better understanding of how debt sustainability of different states changes through favourable and unfavourable economic and financial conditions, which lacks in the aggregate level debt sustainability analysis.

3. Construction of a Composite Indicator

A composite indicator is an index consisting of individual performance indicators. Composite indicators are typically used to summarise many underlying individual indicators or variables. The general public finds it easier to interpret composite indicators than to identify common trends across many indicators, and these indicators are useful for benchmarking the performance of a country (Saltelli, 2007).

However, the construction of composite indicators is challenging. If the associated technical and economic problems occurring during the construction of these indicators are not addressed, they can result in the misinterpretation or manipulation of potential composite measures. Greco et al. (2019) reviewed the literature on the methodological framework of the construction of composite indicators, specifically focusing on weighting, aggregation, and robustness steps.

Many steps are involved in the construction of composite indicators (for details, refer Greco et al. 2019), which are briefly discussed in this section.

i. Theoretical framework

A theoretical framework should be developed to provide the basis for the construction of a composite indicator. A clear definition of the phenomenon to be measured is the prerequisite for the selection and combination of single indicators into a meaningful composite indicator under the fitness-for-purpose principle.

ii. Indicator selection and data quality

Indicators should be selected on the basis of their analytical soundness, measurability, country coverage, relevance to the phenomenon being measured, and their relationship with each other. The use of proxy variables should be considered when data are unavailable. Different approaches should be considered for imputing missing values. Extreme values should be examined because they can become unintended benchmarks.

iii. Normalisation

Normalisation is necessary to ensure the comparability of data, because different indicators do not have a common meaningful unit of measurement, and differ in their range. For any aggregation and weighting methods, the effective weight of indicators depends on measurement units and their range. Therefore, normalisation affects the overall outcome. In this paper, min–max normalisation (or rescaling) was applied.

Let $y_{i,j}$ be the value of the individual indicator i for unit j, with $i = 1,2,...,N$ and $j = 1,2,...,M$. The normalised indicator $x_{i,j}$ is given by

$$x_{i,j} = \frac{y_{i,j} - min_j \{y_i\}}{max_j \{y_i\} - min_j \{y_i\}}.$$

The normalised indicators have a common range between 0 and 1, with 0 and 1 being the worst and optimal values, respectively, indicating a high degree of sustainability.

iv. Multivariate analysis

Multivariate analysis consists of a set of statistical methods that provide insights into the overall structure of indicators, the suitability of the dataset, and methodologies to be followed in next steps. Principal component analysis (PCA) is performed to transform a large set of correlated variables into a small set of uncorrelated variables, termed as principal components, that account for most of the variation in the original set of variables. PCA of subindices can overcome the difficulty regarding the random choice of weights in the construction of the composite index.

First, correlations between indicators are examined. We calculated the $N \times N$ correlation matrix R of normalised indicators. If indicators are uncorrelated, the principal component method would not be appropriate to evaluate weights to construct a composite indicator, because it is based on correlations. Moreover, correlations should not be too high, to ensure that indicators do not measure the same development.

The determinant equation $|R - \lambda I| = 0$ is solved for λ, where I is the identity matrix of the same order as R. This provides a polynomial equation of order N in λ; therefore, N roots can be derived. These N roots are eigenvalues corresponding to R. λ values are arranged in the descending order of magnitude, $\lambda_1 > \lambda_2 > ... > \lambda_N$.

Corresponding to each value of λ, the matrix equation $(R - \lambda_i T) F_i' = 0$ is solved, where $F_i = [f_{1,i}, f_{2,i}, ..., f_{N,i}]$ is a $1 \times N$ eigenvectors corresponding to λ_i, subject to the condition that

$F_i' F_i = 1$. Thus, N eigenvectors $F_1, F_2, ..., F_N$ are generated, which corresponds to $\lambda_1 > \lambda_2 > ... > \lambda_N$.

The N principal components are computed by weighting normalised indicators with eigenvectors corresponding to eigenvalues $\lambda_1 > \lambda_2 > ... > \lambda_N$ as follows:

$$P_{1,j} = x_j F_1'$$
$$\vdots$$
$$P_{N,j} = x_j F_N'$$

where $x_j = \left[x_{j,1}, x_{j,2}, ..., x_{j,N} \right]$ is a vector of standardised indicators for unit j.

The first principal component accounts for the maximum variance of original indicators. The second principal component accounts for the maximum variation of the remaining variance. All principal components are mutually orthogonal. Eigenvalues calculated by performing PCA can be used to identify the number of principal components necessary to represent the variance in the dataset. A frequent practice is to select principal components that have an eigenvalue of ≥1, individually represent at least 10% of the overall variance, and cumulatively contribute to the explanation of the total variance by at least 60%.

v. Weighting and aggregation

Indicators should be weighted and aggregated in accordance with the underlying theoretical framework. Correlation and compensability2 problems among indicators should be considered, and either be corrected for or treated as the features of the phenomenon that need to be retained in the analysis. The choice of aggregation procedures is based on the weighting of indicators. We derive our weights from PCA and use the linear aggregation method to obtain the final index.

Selected principal components were rotated in order to obtain a clear pattern of loadings and a simpler structure of principal components. Following the study conducted by Nicoletti et al. (2000) and OECD (2008), varimax rotation is applied, which minimises the number of variables that have high loadings on a principal component and facilitates the interpretation of these components.

Let $r_{i,k}$ be the factor loadings of indicator i in the selected factor k and $r'_{i,k}$ is the rotated factor loading corresponding to the indicator i in the factor k. The construction of weights is based on the following formula:

The individual factor weight corresponding to indicator i in factor k is calculated as follows:

$$\vartheta_{i,k} = \frac{r'^{2}_{i,k}}{\sum_{i} \lambda_i}, \quad (1)$$

where $\sum_{i} \lambda_i$ is the total variation in normalised indicators.

Then, the final weight for each indicator i, $\omega_i = \sum_{k} \vartheta_{k,i}$

Equation (1) provides a weighting matrix, which included the individual weights of indicators in principal components. Each indicator was weighted in accordance with the proportion of its variance that was explained by the principal component it was associated with. Subsequently, each principal component was weighted according to its contribution to the explained variance in the dataset.

Finally, the composite indicator score for unit j was obtained using the following formula:

$$CI_j = \sum_{i} \omega_i x_{i,j} \quad (2)$$

where $x_{i,j}$ is the normalised individual performance measure of indicator i for unit j and ω_i is the weight attached to indicator i.

vi. Robustness and sensitivity

The robustness of the composite indicator, such as the inclusion or exclusion of indicators, the normalisation scheme, the imputation of missing data, and the choice of weights and the aggregation method, should be examined.

The Cronbach coefficient alpha (C-alpha) is used to estimate the internal consistency of a composite score (OECD, 2008). The C-alpha can be calculated as follows:

$$\alpha_c = \left(\frac{N}{N-1}\right)\frac{\sum_{i \neq j} Cov\left(x_i, x_j\right)}{Var\left(x_0\right)} = \left(\frac{N}{N-1}\right)\left(1 - \frac{\sum_{j} Var\left(x_j\right)}{Var\left(x_0\right)}\right), \; c = 1,2,...,M; \; i,j = 1,2,...,N \quad (3)$$

where M indicates the number of units considered, N is the number of individual indicators available, and $x_0 = \sum_{j} x_j$ is the sum of all individual indicators. The C-alpha measures the total variability of the sample of individual indicators based on its correlation with indicators. It increases with the number of individual indicators and with the covariance of each pair. If no correlation exists and individual indicators are independent, the C-alpha is equal to zero. If individual indicators are perfectly correlated, the C-alpha is equal to one.

4. Empirical Analysis

We constructed a debt sustainability index at the subnational level in India by using the methodology explained in section 3. We used time series data on state finances for the period from 2002-03 to 2019-20 to construct the composite indicator for debt sustainability analysis. The data were obtained from 'State Finances: A Study of Budgets' published by the Reserve Bank of India. Only those states with data available for all relevant variables for the entire study period were included.

On the basis of international practices, 11 fiscal/debt indicators were developed to evaluate the government's ability to manage and repay debt. Table 1 lists individual indicators used to construct the composite indicator, the recommended level of these indicators proposed by various Finance Commissions, Government of India, and abbreviations used in the rest of the paper.

Table 1. Indicators used to construct Debt Sustainability Index

Debt Indicators	Recommended Level	Abbreviation
Interest payment to GSDP	IP/GSDP ↓↓	Ipgsdp
Interest payments to revenue expenditure	IP/RE ↓↓	Ipre
Interest payments to revenue receipts	IP/RR ↓↓	Iprr
Primary balance to GSDP	PB/GSDP > 0	Pbgsdp
Primary revenue balance to GSDP	PRB/GSDP > 0	Prbgsdp
Public debt to revenue receipts	PD/RR ↓↓	Pdrr
Revenue receipts to GSDP	RR/GSDP ↑↑	Rrgsdp
Rate of growth of public debt to GSDP	PDG-GSDPG < 0	Pdg
Outstanding Liabilities to GSDP	OL/GSDP < 25%	Olgsdp
Gross fiscal deficit to GSDP	GFD/GSDP < 3%	Gfdgsdp
Revenue deficit to GSDP	RD/GSDP = 0	Rdgsdp

Source: Finance Commission Reports, Government of India

The first step in PCA is to examine the correlation structure of data, as explained in the section 3. The correlation matrix for the aforementioned 11 indicators is presented in Table 2. Coefficients higher than 0.5 indicates stronger relationships among individual indicators. The corresponding *p*-values of correlation coefficients are provided within parenthesis. To prevent one variable from affecting principal components, individual indicators should be normalised to obtain a common meaningful unit of measurement at the start of the analysis.

Table 2: Correlation matrix for individual indicators

	ipgsdp	ipre	iprr	pdgsdp	prbgsdp	pdrr	rrgsdp	pdg	ossgdp	gfdgsdp	rdgsdp
ipgsdp	1.0000										
ipre	0.1141	1.0000									
	(0.0139)										
iprr	0.1763	**0.9294**	1.0000								
	(0.0001)	(0.0000)									
pdgsdp	-0.0378	-0.0589	0.0281	1.0000							
	(0.4170)	(0.2050)	(0.5453)								
prbgsdp	-0.4185	0.4313	**0.5276**	0.2436	1.0000						
	(0.0000)	(0.0000)	(0.0000)	(0.0000)							
pdrr	0.0578	**0.8326**	**0.9232**	0.0362	**0.5838**	1.0000					
	(0.2136)	(0.0000)	(0.0000)	(0.4367)	(0.0000)						
rrgsdp	-0.5920	**0.5932**	**0.5546**	0.0517	**0.7736**	**0.5776**	1.0000				
	(0.0000)	(0.0000)	(0.0000)	(0.2665)	(0.0000)	(0.0000)					
pdg	0.0473	-0.0191	-0.0020	0.0762	0.0244	0.0026	-0.0494	1.0000			
	(0.3097)	(0.6818)	(0.9652)	(0.1010)	(0.6000)	(0.9553)	(0.2886)				
ossgdp	**0.8686**	-0.0659	0.0392	0.0333	-0.3602	-0.0156	**-0.6414**	0.0920	1.0000		
	(0.0000)	(0.1566)	(0.3990)	(0.4737)	(0.0000)	(0.7378)	(0.0000)	(0.0475)			
gfdgsdp	0.4042	-0.0370	0.0823	**0.7820**	0.0451	0.0567	-0.2415	0.1903	0.4621	1.0000	
	(0.0000)	(0.4268)	(0.0767)	(0.0000)	(0.3319)	(0.2226)	(0.0000)	(0.0000)	(0.0000)		
rdgsdp	-0.2285	0.4888	**0.6110**	0.2949	**0.9527**	**0.6182**	**0.7004**	0.0080	-0.2016	0.1808	1.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.8641)	(0.0000)	(0.0001)	

Source: Author's calculation

Table 3: Eigenvalues of individual indicators

PC	Eigenvalue	% of variation	Cumulative %
1	5.6667	51.52	51.52
2	2.0334	18.49	70.01
3	1.8289	16.63	86.64
4	0.7543	6.86	93.50
5	0.3605	3.28	96.78
6	0.2172	1.97	98.75
7	0.0805	0.73	99.48
8	0.0235	0.21	99.69
9	0.0202	0.18	99.87
10	0.0132	0.12	99.99
11	0.0017	0.01	100.00

Source: Author's calculation

Table 3 lists the eigenvalues[3] of the correlation matrix of the 11 individual indicators that were used to construct the debt sustainability index. The sum of eigenvalues is equal to the number of individual indicators. Given that the correlation matrix instead of the covariance matrix is used in PCA, all 11

individual indicators are assigned equal weights in forming principal components (Chatfield & Collins, 1980).

The first principal component explains the maximum variance (51.52%) in all individual indicators (eigenvalue of 5.67). The second principal component explains the maximum proportion (18.49%) of the remaining variance, with an eigenvalue of 2.03. The third principal component explains 16.63% of the variance, with an eigenvalue 1.83. The last eight principal components together explain the remaining 13.36% of the variance in the data set.

Table 4 presents component loadings for individual debt indicators. The component loadings indicate the correlation between principal components and each individual indicator. The high and moderate loadings indicate how individual indicators are related to principal components.

Table 4: Component loadings for individual indicators

	Principal Components										
Variables	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10	PC 11
ipgsdp	-0.0349	0.2409	0.6540	-0.0696	0.4789	-0.0482	0.1694	-0.0062	-0.3986	0.1706	0.2444
ipre	0.0964	0.6775	0.0440	0.0742	-0.1160	-0.0443	0.0473	0.0144	-0.0723	0.0356	-0.7071
iprr	0.3599	0.1036	-0.2500	0.0714	0.5485	0.1759	0.0981	-0.5933	0.3126	0.0310	0.0033
pbgsdp	0.1150	0.6318	-0.1976	0.1044	-0.3017	-0.0303	0.0010	0.0231	0.0627	-0.0344	0.6634
prbgsdp	0.3676	-0.0791	0.2977	0.1799	-0.1345	0.2968	0.1137	-0.0101	-0.1086	-0.7788	-0.0056
pdrr	0.3513	-0.1204	0.3464	0.1095	-0.2150	-0.0119	0.4625	0.2342	0.5354	0.3582	0.0006
rrgsdp	0.3728	-0.0858	0.2298	0.1940	-0.2184	0.2759	-0.6679	-0.1510	-0.1485	0.3852	0.0086
pdg	0.3503	0.0157	-0.3461	0.0667	0.4092	0.1953	-0.0587	0.7205	-0.1476	0.0533	-0.0025
olgsdp	-0.2362	-0.0634	-0.0113	0.9345	0.1280	-0.2236	0.0116	0.0103	-0.0128	0.0025	-0.0002
gfdgsdp	-0.3795	0.0346	-0.0882	0.1103	-0.1135	0.8155	0.3135	-0.0405	-0.1252	0.2032	-0.0019
rdgsdp	-0.3559	0.1989	0.2823	-0.0422	0.2378	0.2154	-0.4297	0.2202	0.6133	-0.2002	0.0056

Source: Author's calculation

The first three principal components individually explain more than 10% of the total variance, and they together explain approximately 87% of variance. Thus, we retained the first three factors for further analysis without losing considerable information. To understand the meaning of these components, the rotated factor loadings of individual indicators determined through varimax rotation can be analysed (Table 5). The rotation is used to minimise the number of individual indicators that have a high loading on the same factor. The idea behind transforming the factorial axes is to obtain a "simpler structure" of the factors (ideally a structure in which each indicator is loaded exclusively on one of the retained factors).

Table 5: Rotated factor loadings of individual indicators based on principal components

	Factor Loading				Squared factor loading (Scaled to unity)		
Variables	Factor 1	Factor 2	Factor 3	Uniqueness	Factor 1	Factor 2	Factor 3
ipgsdp	0.0386	0.9486	-0.0094	0.0986	0.0003	0.3633	0.0000
ipre	0.9279	0.1163	-0.2032	0.0842	0.1899	0.0055	0.0212
iprr	0.9768	0.0808	-0.0398	0.0377	0.2104	0.0026	0.0008
pbgsdp	0.0895	0.0351	0.9125	0.1582	0.0018	0.0005	0.4269
prbgsdp	0.7342	-0.4380	0.3561	0.1423	0.1189	0.0774	0.0650
pdrr	0.9407	-0.0566	0.0485	0.1095	0.1952	0.0013	0.0012
rrgsdp	0.7709	-0.5574	-0.0175	0.0947	0.1311	0.1254	0.0002
pdg	-0.0042	-0.0324	0.3945	0.8433	0.0000	0.0004	0.0798
olgsdp	-0.1446	0.8877	0.1618	0.1649	0.0046	0.3181	0.0134
gfdgsdp	0.0176	0.4834	0.7797	0.1581	0.0001	0.0943	0.3117
rdgsdp	0.8184	-0.1659	0.3950	0.1467	0.1477	0.0111	0.0800
Expl. Var	4.5339	2.4772	1.9507				
Expl. Var/Total	0.5059	0.2764	0.2177				

Source: Author's calculation

In the last step, weights from the matrix of factor loadings after rotation are constructed, given that the square of factor loadings represents the proportion of the total unit variance of the indicator, which is explained by the factor.

Table 6: Weights of individual indicators for constructing composite indicator based on principal components

	Individual Factor weights			Final
Variables	Factor 1	Factor 2	Factor 3	Weights
ipgsdp	0.0002	0.1004	0.0000	0.1006
ipre	0.0961	0.0015	0.0046	0.1022
iprr	0.1065	0.0007	0.0002	0.1074
pbgsdp	0.0009	0.0001	0.0929	0.0939
prbgsdp	0.0602	0.0214	0.0141	0.0957
pdrr	0.0987	0.0004	0.0003	0.0994
rrgsdp	0.0663	0.0347	0.0000	0.1010
pdg	0.0000	0.0001	0.0174	0.0175
olgsdp	0.0023	0.0879	0.0029	0.0932
gfdgsdp	0.0000	0.0261	0.0678	0.0939
rdgsdp	0.0747	0.0031	0.0174	0.0952

Source: Author's calculation

Individual factor weights are obtained by assigning a weight to each squared factor loading, equal to the proportion of the explained variance. The final weights for individual indicators for constructing the debt sustainability index are calculated by adding individual factor weights corresponding to each individual indicator. The individual factor weights and final weights obtained on the basis of the principal component method are listed in Table 6.

Different methods used for the extraction of principal components provided different factor loadings, and thus different weights for individual indicators. The weights used for constructing the composite indicator by using different extraction methods, namely principal component factor (PCF), principal factor (PF), iterated principal factor (IPF), and maximum likelihood (ML), are listed in Table 7. As Table 7 shows, the weights are approximately equal for all the different extraction methods.

Table 7: Weights for constructing composite indicator based on different methods for the extraction of the common factors

Variable	PCF	PF	IPF	ML
ipgsdp	0.1006	0.1088	0.1153	0.1045
ipre	0.1022	0.1217	0.1271	0.1252
iprr	0.1074	0.1227	0.1244	0.1198
pbgsdp	0.0939	0.0851	0.0870	0.1230
prbgsdp	0.0957	0.0754	0.0562	0.0603
pdrr	0.0994	0.1029	0.1005	0.0995
rrgsdp	0.1010	0.1133	0.1109	0.1085
pdg	0.0175	0.0068	0.1008	0.0068
olgsdp	0.0932	0.0903	0.0018	0.1088
gfdgsdp	0.0939	0.0950	0.1136	0.0859
rdgsdp	0.0952	0.0781	0.0625	0.0576

Source: Author's calculation

Table 8 presents values of the Cronbach coefficient alpha and covariance with the total after deleting one individual indicator at a time. The C-alpha is a coefficient of reliability based on the correlation between individual indicators. If the correlation is high, individual indicators are measured under the same underlying construct. Therefore, a high C-alpha, or a equivalently high reliability, indicates that individual indicators effectively measure the latent phenomenon. Nunnally (1978) suggests 0.7 as an acceptable reliability threshold.

The C-alpha value of original indicator variables of the study is 0.8087, which implies that the consistency of indicator variables used for the construction of composite indicators is satisfactory. The variable 'pdg' is removed from final index because it is not correlated with most of the variables. The C-alpha is further increased to 0.8338 after its removal.

The final weights obtained after the removal of the indicator 'pdg' is listed in Table 9. The weights obtained from principal component factors are used to construct the composite indicator. The simplest additive aggregation method given in equation (2) is adopted to construct the final index.

Table 8: Cronbach coefficient alpha results for individual indicators

Deleted	Covariance	Cronbach coefficient alpha
ipgsdp	0.2975	0.8090
ipre	0.2613	0.7796
iprr	0.2507	0.7699
pbgsdp	0.3339	0.8337
prbgsdp	0.2380	0.7575
pdrr	0.2435	0.7630
rrgsdp	0.2364	0.7558
pdg	0.3341	0.8338
olgsdp	0.3004	0.8111
gfdgsdp	0.3374	0.8359
rdgsdp	0.2467	0.7661
All	0.2776	0.8087

Source: Author's calculation

Table 9: Final weights for constructing composite indicator based on different methods for the extraction of the common factors

Variable	PCF	PF	IPF	ML
ipgsdp	0.1019	0.1011	0.1010	0.1068
ipre	0.1038	0.1121	0.1077	0.1046
iprr	0.1085	0.1140	0.1096	0.1087
pbgsdp	0.0971	0.0784	0.0836	0.0788
prbgsdp	0.0974	0.1069	0.1054	0.1087
pdrr	0.1004	0.0987	0.0955	0.0916
rrgsdp	0.1019	0.1089	0.1062	0.1014
olsgdp	0.0939	0.0847	0.0898	0.1087
gfdgsdp	0.0981	0.0896	0.0982	0.0938
rdgsdp	0.0970	0.1057	0.1029	0.0969

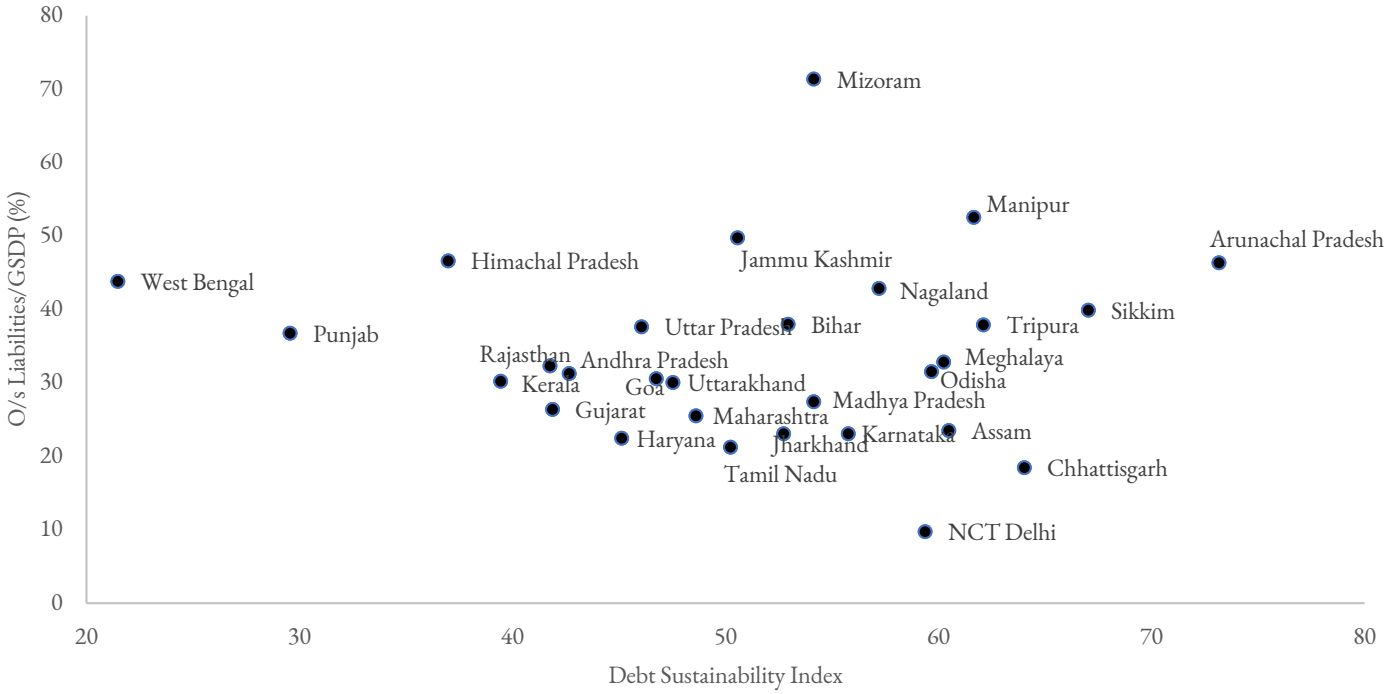
Source: Author's calculation

The resulting state-wise debt sustainability indices for the period from 2003-04 to 2019-20 are listed in Table 10. The higher the index value is, the better is the performance of the state in terms of debt sustainability.

Table 10: State-wise Debt Sustainability scores for the period 2003-04 to 2019-20

State	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Average
Andhra Pradesh	51	42	43	46	46	43	45	49	47	40	42	31	36	36	47	48	33	43
Arunachal Pradesh	55	50	65	81	80	62	72	82	65	69	60	89	90	90	86	71	78	73
Assam	59	59	66	63	65	68	55	63	63	60	63	59	64	61	46	58	56	60
Bihar	46	54	44	50	53	56	56	59	59	57	60	54	53	55	52	55	37	53
Chattisgarh	58	62	66	65	65	66	69	73	72	65	67	60	63	66	64	59	49	64
Delhi	55	65	58	55	55	49	58	59	54	54	60	58	59	59	67	72	71	59
Goa	53	53	49	48	48	46	48	53	51	41	44	44	42	47	47	38	42	47
Gujarat	43	42	44	43	44	37	40	41	43	39	44	39	36	40	47	46	43	42
Haryana	55	59	60	60	57	48	50	53	49	42	47	36	25	28	38	33	28	45
Himachal Pradesh	27	31	44	42	44	31	35	43	45	35	39	34	40	39	38	32	29	37
Jammu & Kashmir	70	66	59	56	44	54	57	53	51	42	46	35	37	45	55	40	51	51
Jharkhand	60	53	49	47	40	48	59	53	58	53	58	52	47	51	59	51	57	53
Karnataka	59	63	61	57	57	54	56	57	59	54	59	53	52	52	55	51	50	56
Kerala	46	46	44	42	42	40	42	40	40	34	40	34	33	34	41	40	31	39
Madhya Pradesh	50	50	52	52	53	53	58	59	61	55	60	55	54	52	54	51	50	54
Maharashtra	50	49	48	49	55	48	48	49	49	48	50	44	43	45	50	54	49	49
Manipur	53	51	63	56	75	68	54	60	58	76	77	61	60	62	64	59	52	62
Meghalaya	64	59	62	61	60	57	67	63	57	64	67	55	57	59	61	55	59	60
Mizoram	48	50	43	48	39	62	53	46	59	42	50	50	71	73	68	67	51	54
Nagaland	71	62	61	61	55	58	56	64	59	53	62	59	53	58	51	50	40	57
Odisha	42	51	48	55	58	60	60	64	70	65	68	65	64	63	64	56	60	60
Punjab	43	42	45	37	38	31	38	38	28	27	33	24	16	7	19	20	16	30
Rajasthan	40	41	41	43	45	40	42	48	52	48	51	45	30	30	39	41	33	42
Sikkim	79	69	73	71	74	62	74	64	73	73	77	64	57	65	61	50	53	67
Tamil Nadu	55	59	60	56	56	54	55	54	55	51	54	46	41	37	41	44	36	50
Tripura	60	65	66	66	63	65	76	68	77	74	71	58	52	54	49	51	41	62
Uttar Pradesh	37	38	47	46	45	40	50	49	51	46	53	46	42	45	52	48	48	46
'Uttarakhand	50	39	48	52	48	48	49	54	53	49	56	46	42	43	49	40	41	48
West Bengal	23	25	23	19	20	18	14	20	19	16	19	16	20	23	30	33	27	21

Figure 1: Scatter plot of Debt Sustainability Index and outstanding liabilities to GSDP (average for the period 2003-04 to 2019-20)



This new index provides a starting point for debt sustainability analysis. Although this index can be used as a summary indicator to guide public debt policymaking, it can be decomposed such that the contribution of individual indicators in the final index can be identified and the state-wise performance can be analysed.

Moreover, the debt sustainability index can be linked with other variables and measures for further analysis. For example, in Figure 1, the debt sustainability index helps to assess the position of a state government relative to outstanding liabilities. The analysis of selected individual indicators can help to understand the relative position of state governments in the overall debt sustainability index. The detailed analysis of the performance of each state government by using the proposed composite indicator is not discussed here, leaving that for future research.

5. Concluding Remarks

Debt sustainability analysis frameworks provide an intertemporal consistency check that under current policies, a country or a government will be able to service its debts in the medium and long run without renegotiating or defaulting the policies. This paper proposes a new framework for public debt sustainability analysis by constructing the debt sustainability index, a sound composite indicator based on different fiscal or debt indicators of a country or a government. We emphasised the need for

an explicit conceptual framework for the construction of a composite index and the usefulness of multivariate statistical analysis prior to the aggregation of individual indicators.

Most composite indicators rely on equal weighting, that is, all variables are assigned the same weight. This implies that all variables are the same in the composite, but it could reflect the absence of a statistical or an empirical basis. In the present study, statistical methods, such as PCA, are used to group individual indicators in accordance with their degree of correlation. However, weights cannot be estimated using these methods if no correlation exists between indicators. Thus, we selected 10 significantly correlated debt indicators, measuring the multiple aspects of fiscal or debt position of state governments in India, to construct the composite indicator.

PCA involves the use of the factor loadings of the first component to serve as weights for indicators. However, the first component alone is inadequate to explain a large proportion of the variance in indicators, thus requiring more components. In this study, the first three principal components were used for analysis. This paper uses PCA as the extraction method and varimax rotation to minimise the number of indicators with high loadings on each component. By considering the factor loadings of all retained factors, we could preserve the largest proportion of variation in the original dataset.

The final step involves the selection of weights used to construct the composite indicator. The approach followed in this paper was to weigh each individual indicator in accordance with the proportion of its variance that is explained by the factor it is associated to (i.e. normalised squared loading). Each factor was weighted according to its contribution to the portion of the explained variance in the dataset (i.e. the normalised sum of squared loadings). Finally, the additive aggregation method was adopted to construct the debt sustainability index.

To sum up, we constructed an index based on the composite indicator approach for the assessment of the debt sustainability of national/sub-national governments. The index was used to determine the comparative position of different Indian sub-nationals in terms of debt sustainability. The findings of this study are in accordance with those of previous studies on the debt sustainability of sub-national governments in India.

The proposed composite indicator can help summarise various debt indicators for assessing debt sustainability. Moreover, this index can be used as a benchmark to measure the performance and compare the performances of governments or countries in terms of debt sustainability. Future studies should determine the sustainable level of public debt based on the composite indicator.

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Notes

[1] The rollover risk mainly encompasses the possibility of rolling over debt at relatively higher cost and in extreme circumstances, failure to rollover debt completely/ partially.
[2] Compensability refers to the existence of trade-offs, i.e., the possibility of offsetting the poor performance in some indicators with outstanding performance in another.
[3] The eigenvalues are related to the variances of the indicators on which the correlation matrix is based. The eigenvalue for each principal component indicates the percentage of variation explained in the data by that principal component.

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IPPR

Financial Flows of the Blue Continent

A Case Study of Potential Pacific-India-Australia Collaboration

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Abstract

This paper proposes a collaborative effort between India, Australia, Papua New Guinea, and Fiji to pilot a payments system using the infrastructure underlying India's Unified Payments Interface framework. This aims to catalyse the creation of an open, interoperable, and efficient regional payments system in the Pacific that enfranchises all stakeholders. While cost is a central factor, existing funds within the Pacific Financial Inclusion Programme, Forum for India-Pacific Islands Cooperation, Pacific Islands Forum, India-UN Development Partnership Fund, or Quadrilateral Security Dialogue can be leveraged. Frank dialogue about the financial needs of Pasifika peoples and their countries is critical, and open-source protocols can allow for tailor-made, sovereign solutions without vendor lock-in. Current efforts to strengthen regulatory frameworks and address money laundering risks should also continue in concert with this endeavour. More broadly, this paper demonstrates India's potential to collaborate with Australia – and others – to create positive outcomes for low-income states. The policy recommendation in this paper exemplifies how such collaborations can drive positive change globally and accelerate progress for the developing world, such as in the Pacific Islands.

Keywords: India, Australia, Pacific, UPI, financial inclusion, Pacific Islands

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1. Introduction

During its G20 Presidency, the role that Digital Public Infrastructure ('*DPI*') played in India's public service delivery, pandemic response, economic development, and digital and financial inclusion was front and centre. Now, with over a decade worth of experience in building these digital systems at scale (a scale much larger than most), India hopes to develop open technological solutions to socio-economic issues, with a focus on improved governance, inclusion, and efficiency. Many countries could benefit from its leadership on building digital identity, fast payments, and data transfer systems in a way that empowers citizens with individual sovereignty over their own data (Matthan, 2022).

As India mounts the world stage as an economic and technological superpower, it is seeking to engage both more deeply with existing partners, and more broadly with areas previously outside its sphere of concern. Australia is an example of the former, and Pacific Island Countries ('*PICs*') are an example of the latter. In this pursuit, India's DPI is a potent soft power tool which it can use to help solve some of the major challenges for developing countries. Strategically positioned as a conduit between the Global North and South, India can help build technological solutions for low- to middle-income countries directly informed by its own experiences.

This paper will demonstrate the value India could bring to PICs by using its Unified Payment Interface ('*UPI*') as the basis for a regional instant payment system. It will act as a case study of how India can leverage its partnerships with developed countries to campaign for and create positive outcomes for countries in the Global South. The proposal contained herein is proof of concept of partnerships which could be developed to push positive change around the world, and accelerate progress towards the Sustainable Development Goals 2030.

2. Background

Preliminarily, there are definitional issues with the concept of 'digital public infrastructure' (DPI), a term coined by politicians and policymakers, and a subject on which the literature is nascent (Gupta and Nair, 2023). The DPI movement is inspired by the open standards and specifications that led to some of the most transformative technological advancements of our time, namely the Internet and mobile networks (Centre for Digital Public Infrastructure, 2024).

There are common buzzwords across the rhetoric of those championing DPI, such as 'inclusion', 'accountability', 'interoperability', 'accessibility', 'scalability', and 'open standards' (Centre for Digital Public Infrastructure, 2024; Dhamija et al., 2024; Massally, Matthan, and Chaudhuri, 2023). DPI is beyond simple software but encompasses technology, markets, and governance, and is underpinned by common design, robust governance, and private sector participation (Massally, Matthan, and Chaudhuri, 2023).

These definitions market DPI as leading us to a utopian future reminiscent of Arthur C. Clarke's third law: 'Any sufficiently advanced technology is indistinguishable from magic.' It provides little guidance to policymakers, especially those without the technical expertise at hand to understand complex ICT solutions. The international community has been slow to focus on and adopt a definition that aptly describes the purpose, requirements, and nature of DPI. The only working definition provided by a multilateral body was contained in the Outcome Document from the G20 Digital Ministers' Meeting last year:

> Under the Indian Presidency's initiative, we recognise that digital public infrastructure, hereinafter referred to as DPI, is described as a set of shared digital systems that should be secure and interoperable, and can be built on open standards and specifications to deliver and provide equitable access to public and/or private services at societal scale and are governed by applicable legal frameworks and enabling rules to drive development, inclusion, innovation, trust, and competition and respect human rights and fundamental freedoms (G20, 2023).

This definition, and many others, merely tout the benefits of DPI, or offer a set of aspirational standards which DPI must exhibit. These normative approaches are dressed-up opinions about what DPI *should* be, not what it *is*, and often have ideological undercurrents (Gupta and Nair, 2023). The definition put forward at the G20 is vague, with the exact nature and features of DPI still unclear. For example, many current solutions considered to be DPI are not 'built on open standards and specifications', especially if considered 'secure' (G20, 2023).

International institutions have provided no substantive guidance about 'applicable legal frameworks', and for many countries looking to develop DPI, simultaneously 'enabling...inclusion, innovation, trust, and competition' is near impossible. The definition of DPI is outside the scope of this paper, but scholars and policymakers should put more thought into developing objective and empirical frameworks which measure the applicability and suitability of DPI, and guide its implementation (Gupta and Nair, 2023).

A common analogy to explain DPI characterises it as the 'digital rails' or 'digital building blocks' upon which goods and services can be built to benefit entire populations (Chakravorti, 2023; Alonso et al., 2023; Manur, 2023). In India, the set of Application Programming Interfaces ('*APIs*') and shared standards used to support these solutions is called 'India Stack'. This name borrows the 'stack' phraseology from the ICT world, and refers to the physical, connective, and application layers of DPI (Chakravorti, 2023).

The 'connective' layer, considered the most crucial, generally consists of digital identity, payments, and data exchange systems (Alonso et al, 2023; Manur, 2023). For the everyday Indian, these are respectively Aadhaar, Unified Payments Interface ('*UPI*') and Account Aggregator. This connective layer is the foundation for the application layer, where private actors can create a range of end-user products automatically available to huge populations. This modular and extensible approach where new innovations can be built on preceding ones results in a deeply enmeshed ecosystem of solutions.

UPI is an real-time payment network built, owned, and operated by the National Payments Corporation of India ('*NPCI*'), a not-for-profit company jointly owned by the Reserve Bank of India and major banks in India (National Payments Corporation of India, "About Us.", 2023; Alonso et al., 2023). Its interoperable protocol allows anyone to build an app providing payments as a service to all customers of participating banks (Alonso et al., 2023). The payments are settled instantly and for almost zero cost.

According to the NPCI, there were over twelve billion transactions on the UPI network in February 2024 (National Payments Corporation of India, "UPI Product Statistics", 2024). UPI has demonstrated that it is a robust payments interface, which within three years of launch was effortlessly processing 750 million transactions per month, which is now closer to ten billion (Matthan, 2019). The central protocols and infrastructure are under the control of the National Payments Corporation of India ('*NPCI*')[1], while the market strategy and end-user experience are spearheaded by the private sector. Market participation rules can be directly encoded into the infrastructure without stifling innovation and consumer-centric outcomes (Matthan, 2022).

Other economies have seen how this approach enables financial inclusion and provides users with access to services using their digital footprint (ibid).

- Last year, UPI was connected with Singapore's PayNow and the UAE's NEOPAY systems, and Nepal and Bhutan have been using it since 2022.
- In Sierra Leone, digital wallets used during the Ebola crisis allowed response workers to receive fast, accurate, and secure payments which augmented the country's ability to contain the disease (Matthan, 2023).
- The well-studied mPESA service in Kenya has been responsible for lifting an estimated million people out of abject poverty (ibid).

India is in discussions with more countries to install systems based on UPI, touting the micro- and macro-economic benefits which an instant payments system can provide. Of India's DPI offerings, UPI has the clearest use case in other jurisdictions, and could rectify significant issues with current payments systems, including in the Pacific.

There are caveats to the success of this model, factors unique to the Indian context or design decisions that would not be replicable in other markets. For example, the Government of India has mandated that banks not charge transaction fees on UPI payments, in order to attract users. It pays them a compensatory subsidy to achieve this, which amounted to almost $257 million in the most recent budget, a two-fold increase from the $125 million previously allocated (Choudhury, 2023). This strategy seems to have worked, as the two-year period from 2020 to 2022 saw UPI transaction gross value increase four-fold, from $0.4 to $1.5 billion (ibid).

Some might attribute this rapid uptake to the COVID-19 pandemic, due to the need for contactless payments and emergence of widespread government stimulus disbursements. Undoubtedly, the government played the anchor client role, opening basic bank accounts and using UPI to make social security payments (Alonso et al., 2023). However, in 2021 and 2022 alone, the volume of UPI transactions jumped by 40% and the gross value increased by 76%, demonstrating long-term uptake by individuals and the private sector (Ahuja, 2023).

The regulations which mandate zero-cost transactions, however, significantly disadvantage the companies creating products in that final applicational layer. This scheme is unlikely to be sustainable in the long-term in India, nor would it receive the same altruistic private investment in other markets. The end-user application market for UPI is dominated by three companies – PhonePe, Google Pay and Paytm – who collectively possess 94% market share (Menon, 2022). The largest is PhonePe, which reported a loss[2] of 16.12 billion rupees in the 2022 financial year, which widened to 17.55 billion in FY2023 (Reuters, 2023). These companies have failed to report profits due to the absence of transaction fees (Menon, 2022).

To achieve profitability, these companies would only require a miniscule levy on the 11.6 billion transactions worth $134 billion that are recorded monthly.[3] The NPCI and government leaders in India argue that zero-cost transactions have been instrumental to UPI's success, whereas private actors point out that the digital innovation, especially in end-user applications, has been a more decisive factor in attracting users (Sunilkumar, 2023).

In February, new Reserve Bank of India limitations saw Paytm's UPI transactions drop from 1.4 billion to 1.3 billion, further cementing a PhonePe/Google Pay duopoly, and increasing concerns about the long-term sustainability of UPI (ET Online, 2024). In India, private players might have a higher risk tolerance for direct losses on UPI transactions, because of the access UPI provides to the country's vast population. In other countries, however, private actors will need to be more certain of returns before they pour resources into developing new products.

Regardless, the net benefit that UPI has provided for India and its citizenry is undeniable, and the underlying infrastructure shows promise for international application. The modular, open and interoperable characteristics of the technology will allow for versatile, tailored solutions for different markets, and help to address unique national and regional challenges.

3. Geopolitical Context

3.1 India and the Pacific

India has had cursory interactions with the Pacific countries through the Commonwealth, the Non-Aligned Movement, and the UN system (Saint-Mézard, 2023). In 2006 it became a Pacific Islands Forum (PIF) dialogue partner, primarily due to its special relationship with Fiji, where 40% of the population originate from indentured servants the British Empire brought from India (ibid).

India's diplomatic presence in the region is sparse as its focus has been on island states in its own Indian Ocean Region (ibid).

In the early '90s, India introduced a 'Look East' policy which focused on building socio-economic and cultural ties with South-East Asian states through multilaterals such as ASEAN and the East Asia Summit (Wadhwa, 2019). When Prime Minister Narendra Modi and his government were elected in 2014, this was reshaped into the 'Act East' policy, which aimed to drive deeper engagement across South-East Asia, but also Japan, South Korea, Australia, and the Pacific Islands (ibid). This coincided with the US' Obama Administration changing its chief strategic concern from the Middle East to the Asia-Pacific, which was soon coined the 'Indo-Pacific' to enfranchise an emergent India as a strategic and economic power (ibid).

With India taking a more active role in ensuring the region is free, open, inclusive, and resilient, it has sought to engage more deeply with PICs. The main body for cooperation is the Forum for India-Pacific Islands Cooperation ('*FIPIC*'), launched by Prime Minister Modi during a visit to Fiji in 2014, as part of the Act East Policy (Ministry for External Affairs India, 2023).

More recently, India's strategic and economic interests have aligned to match those of its partners in the Quadrilateral Security Dialogue ('*Quad*')[4] and it has sought to engage more extensively with the Pacific on security, trade, development, disaster relief and more. In 2017, it convened the India-Pacific Islands Sustainable Development Conference in Fiji and in 2019, the India-Pacific Small Island Development States Meeting (on the sidelines of the UN General Assembly) (Saint-Mézard, 2023).

India has provided training for nearly 1000 Pacific officials between 2015-2023, and sent experts on long-term secondments to national and regional agencies (ibid). It has also funded many projects in the Pacific through the India-UN Development Partnership Fund, including solar-powered refrigeration in the Republic of the Marshall Islands, upgraded facilities and equipment in Palau's community health centres, and the repair and reconstruction of an export and fumigation facility in Tonga (ibid). The Fund was established in June 2017 to help encourage Global South countries to meet their Sustainable Development Goal targets, and the Government of India committed $100 million to the fund for this decade, as well as an additional $50 million for Commonwealth countries (Permanent Mission of India to the United Nations, 2023). From 2017 to 2019, the Fund developed 36 projects in 37 partnering countries with 21 already under implementation (ibid).

At FIPIC 2023, PM Modi unveiled a 12-point plan to further drive India's engagement with the Pacific Islands (Press Trust of India, 2023). It was announced that the India-funded Centre for Excellence for IT in Papua New Guinea would be upgraded and transformed into a Regional Information Technology and Cybersecurity Hub (ibid). A further 1000 scholarships for training PIC officials were also announced (Saint-Mézard, 2023).

India cleverly engages with the Pacific not in its role as a regional power or Quad member, but as a fellow Global South country facing similar development challenges. It holds itself as a voice for the Global South, indicated by the Voice of the Global South Summit it held this year (ibid). It also leads

landmark multilaterals aimed at challenges disproportionately affecting developing countries, such as the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure (ibid).

There has been a gradual positive shift in India's foreign policy in the Pacific due to a more transparent and inclusive relationship built on historical ties with countries like Fiji, a focus on driving development and cooperation in the Global South, and a shift in its strategic aims to creating a stable and peaceful external environment for its own growth (Pandey, 2023). This has paralleled the pivot of other actors -- such as the US, UK, France, the EU, Australia, and New Zealand -- to the Indo-Pacific, to help ensure it continues to create economic opportunities for all, and to sustain the peace which is a necessary precondition for that prosperity.

3.2 Australia and the Pacific

Australia has been the key security, development, and engagement partner for many Pacific Island countries. It is the region's largest development partner, with budget estimates showing Australian Overseas Development Assistance ('*ODA*') to the Pacific region in 2021-22 totalled USD 1.03 billion (Department of Foreign Affairs and Trade Australia, 2023). Papua New Guinea is the largest recipient of this aid, followed by the Solomon Islands, Vanuatu, and Fiji (ibid).

Australia has a small Pasifika[5] diaspora of 337,000 people, whilst over 38,000 additional Pasifika peoples work temporarily in Australia under the Pacific-Australia Labour Mobility ('*PALM*') Scheme (Collins, 2023). Between July 2018 and December 2021, short-term workers in Australia remitted approximately $681 per month, while for long-term workers it was closer to $841 per month (ibid). These numbers are expected to expand in the coming years as the diaspora grows at a faster rate than the general population, plans to expand the PALM Scheme are advanced, and the new Pacific Engagement Visa becomes available (ibid).

There is a storied history between the Australia and Pacific countries, marred by practices such as blackbirding[6], but since most Pacific countries obtained independence from their colonial powers, Australia has provided help, support, and safety. The exceptions would be those which are dependent territories or freely associated states with the US[7], France[8] and New Zealand.[9]

Australia's close relationship with the Pacific, including as a founding member of the Pacific Islands Forum ('*PIF*'), has also been affected in recent years by accusations of paternalism and an 'insulting and condescending' attitude, and frustration amongst Pacific states concerning Australia's reluctance to act on climate change (Turnbull, 2022). A change of government in Australia in 2022, however, led to PM Anthony Albanese declaring a 'new era' for Australian engagement in the Pacific. This has been followed up with high-level visits to every Pacific country, new commitments to combatting climate change at home and abroad, and an emphasis on speaking to the Pacific Islands with respect (ibid).

Australia has committed to providing an additional $318 million in aid over the next four years. Its most recent aid policy also promises to 'strengthen trade and business ties within the region, including through Australia's banks', which seeks to address the desertion of the region by major Australia

banks, as discussed below (Herr, 2023). In November 2018, Australia also committed to delivering $1.38b for its Australian Infrastructure Financing Facility for the Pacific, which aims to provide funding for energy, water, transport, telecommunications, and other projects that are predicted to improve outcomes for Pacific Islanders (Wadhwa, 2019; Australian Infrastructure Financing Facility for the Pacific, 2023).

As the most developed country in the neighbourhood and a close US ally, Australia continues to endeavour to support, strengthen, and invest in PICs in a genuine manner to improve its desirability as the partner of choice. The Pacific Islands, however, are responding with increasing suspicion, all too aware of their small size and strategic importance, which makes them vulnerable to manipulation and great power security concerns (Herr, 2023). This partly reflects the increasing securitisation of the region, such as the emergence of the Quad as a new 'minilateral' quite clearly intended to help counter China's regional influence.

3.3 The Role of the Quad

The Quadrilateral Security Dialogue consists of the United States, Japan, India, and Australia, and has dramatically deepened its engagement with the Pacific in recent years. The Quad contributes across many domains, including infrastructure. It works on disaster risk reduction, largely in the Pacific, through its Infrastructure for Resilient Island States ('*IRIS*') initiative (Sharma and Manoj, 2023). This has aided in capacity-building efforts towards digital and economic connectivity, clean energy, and power sector infrastructure (ibid).

The work of the Quad Infrastructure Working Group is relevant, as it assesses regional infrastructure needs and coordinates on technical assistance, as well as ensuring that infrastructure investments do not place unsustainable debt burdens on recipient countries, a criticism often levelled at China when funding projects in developing countries ('*debt-trap diplomacy*') (ibid).

In their 2023 Joint Statement, the Quad leaders reaffirmed their commitment to working with the Pacific Islands to 'achieve shared aspirations and address shared challenges', a sentiment somewhat undermined by the fact that only India would broadly share the same challenges as Pacific states (The White House, 2023). They announced plans to continue to improve infrastructure development in the region through their own IRIS initiative, and also the India-led CDRI mentioned above. This was complemented by the announcement of a Quad Infrastructure Fellowships Program which aims to train over 1800 regional practitioners to design, build and manage quality infrastructure in their home countries (ibid).

Another infrastructure initiative announced this year was the Quad Partnership for Cable Connectivity and Resilience which aims to draw on its members' expertise in manufacturing, delivering and maintaining cable infrastructure (ibid). Notably, the Quad also announced a joint effort to deploy an Open Radio Access Network ('*Open RAN*') in Palau, the first in the Pacific, an effort to strengthen and diversify the telecommunications infrastructure supply chain in the region. The idea that the Quad could play a role in DPI deployment adoption in different jurisdictions has

been suggested in the past, and it certainly presents as one of multiple options for building core DPI capabilities in the Pacific region (Chaudhuri and Gupta, 2024).

The important caveat to these initiatives, however, is that the Quad assumes responsibility for and covers a large area. These programs are potentially always on the proverbial chopping block, as the attention of one or all four members shifts rapidly from the South China Sea, to the Pacific, to the Indian Ocean Region, to *outer space* or *the cybersphere* and around again.

Further, the individual members view the Quad markedly differently, with Japan emphasising it as a group of regional democracies, India viewing it as a mechanism for functional cooperation, and Australia hesitating to call it a formal alliance (Smith, 2021). It is, however, undoubtedly beneficial in the long-term for developing countries in the region, as these states flood the Pacific with expertise, resources, and support to counter China's influence. It also provides an opportunity for India to bring that important Global South voice to a meeting of key regional players, which could help avoid future accusations of paternalism. Although the Quad does not necessarily have digital payments within its purview, its members often collaborate on joint initiatives in bilateral or trilateral arrangements not under the Quad banner. The solution proposed in this paper is one such example.

4. Problem Description

4.1 The Pacific's Need for Instant Payments Systems

4.1.1 Financial Inclusion

Currently, approximately 37% of the global population – 3 billion people – are not digitally connected, yet 70% of global economic value will be generated by the digital economy in the next decade (Mita, 2023). The terms 'digital inclusion' and 'financial inclusion' are almost synonymous in this digital age.

Globally, COVID-19 resulted in the emergence of some fintech and other non-bank financial services, and increased adoption of cashless transactions in remote areas and villages where dispensers, ATMs and financial institution branches were hard to access (Sheth, 2021). These were collaborations between financial institutions and other payment service providers, government agencies, intergovernmental organisations, multinational corporations, fintech providers and agent networks (ibid).

The expansion of formal financial services has created new economic opportunities, increased account ownership and built household resilience against financial shocks (World Bank Group, 2022). As of 2021, 76% of adults globally have an account with a bank, other financial institution, or mobile money provider, up from 51% a decade prior (ibid). During the pandemic, low- and middle-income countries saw over 40% of adults use a card, phone, or the Internet to make a merchant, in-store or online payment for the first time (ibid).

Two-thirds of adults worldwide now make or receive digital payments. The Global Findex Database found that receiving payments into an account instead of in cash catalyses use of the formal financial system, as 83% then use that account to make payments (ibid). The establishment of an interoperable and accessible digital payment infrastructure can provide the foundation for the second-order lending and investing services which contribute to business growth, innovation and entrepreneurship, and development.

The Pacific truly is the wild frontier when it comes to digital transformation, especially in payments. PICs have small and geographically sparse populations, with an average of 34 people per square kilometre (Statham et al., 2021). This is exacerbated by high emigration rates to Australia and New Zealand. Regional GDP sits at USD 23 billion (USD 3600 per capita), which pales in comparison to nearby Australia's USD 1.3 trillion (USD 51812 per capita) (ibid). The small regional economy and production base has created diseconomies of scale for many businesses, which hinders the growth of services, and discourages international players from entering these thin markets (Statham et al., 2021; Collins, 2023). In the Pacific, only 40% of adults have a bank account due to remote living, challenges acquiring identity documents and accessing bank branches, and a regional preference for cash (Collins, 2023).

There have been collaborative efforts to improve Pacific Islanders' access and enfranchisement in the formal financial system. The Pacific Financial Inclusion Programme ('*PFIP*'), a collaboration between the UNDP and UNCDF, worked with the PNG Women's Micro Bank to set up access points for customers to access basic transaction services (de Groot, Payne and Reddaway, 2022; Statham et al., 2021). Mobile Network Operators ('*MNOs*') are also important stakeholders in the Pacific payments space, and the PFIP worked with the two major regional providers, Vodafone and Digicel, to launch mobile money solutions in Fiji in 2010, which have now expanded to other countries too (de Groot, Payne and Reddaway, 2022). These efforts are a step in the right direction, and demonstrate that a digital solution which helps to maintain security whilst working around the accessibility challenges of the Pacific is ideal.

4.1.2 Remittances

Limited natural resources and economic opportunities leads to large Pasifika diasporas in these richer neighbouring countries, and dependency on inbound remittances. During the COVID-19 pandemic, remittances outperformed foreign direct investment ('*FDI*') and overseas development assistance ('*ODA*') as a source of income for low to middle-income countries (Collins, 2023). For many smaller Pacific countries, remittances comprise upwards of 40% of total GDP, and even in Fiji, which has the most inbound remittances by dollar value, it still represents a significant 9.2% segment (World Bank Group, 2023; Collins, 2023).

The average cost of a remittance transaction to Fiji was 10.2%, which is exorbitantly high compared to the G20 global target of 5%, or the UN Sustainable Development Goal ('*SDG*') target of 3% (Collins, 2023). There have been efforts, such as through the Pacific Working Group on Remittances

('*PWGR*') to integrate regional payments systems to align them with the SDGs, which also includes removing corridors with costs above 5% per transaction completely (Statham et al., 2021).

Multilateral and bilateral partnerships which provide PICs with this foreign aid have also driven efforts to improve digital payments. The Tonga Development Bank in cooperation with The World Bank, Australia, and New Zealand, launched the *'Ave Pa'anga Pau* voucher system, which allowed diaspora and seasonal workers to remit funds fixed at interbank rates. Mobile money wallets developed by MNOs, as mentioned above, resulted in a 28% increase in remittances during the 2020-21 financial year too (Collins, 2023).

However, these pilot programs are built as siloed one-off development solutions, rather than open and interoperable frameworks upon which any private entity can expand. Due to the small populations involved, the network effect is not sufficient to provide transaction volumes that justify continued investment. Therefore, these solutions are either heavily subsidised by national or international development partners, which is not a sustainable solution, or are slowly wound up as the private entities involved seek to invest elsewhere.

4.1.3Innovation and Entrepreneurship

End-consumers and merchants play an important role in digital payments systems. Their inclusion requires suitable point-of-sale ('*POS*') terminals and gateways, low latency settlements, and basic infrastructure such as electricity and connectivity. In the Pacific, many products and services provided by small or medium enterprises ('*SMEs*') are marketed online but transactions are completed in cash. There have been grassroots efforts, such as through local online marketplaces such as Vitikart, Pacifickart, CyberFood, to provide seamless e-payment options; however, the absence of underlying infrastructure hinders these efforts (Statham et al., 2021).

The acceleration of digital transformation in the region could not only reduce leakages and losses in these direct sources of income, but create new opportunities for innovation and entrepreneurship. As Datuk Paul Khoo, CEO of Malaysian technology firm ReGov Technologies said: 'In a region where small economies are cut off from each other and the rest of the world by vast distances, a digitally-connected Pacific can become a significant economic bloc' (Mita, 2023).

4.2 Common Development Challenges

There are a number of characteristics about India's development of DPI unique to its situation. Due to the need for support payments during COVID-19, the government acted as an important anchor client which encouraged society-wide adoption (Alonso et al., 2023). India has a high IT capacity in its domestic labour market, which allowed it to develop these solutions in-house and avoid siloed solutions (ibid).

India has subsequently endeavoured to increase the accessibility and availability of this infrastructure and help other developing countries avoid vendor lock-in as well. As part of the G20 Digital Economy Ministers' Meeting, India offered to develop a Global Digital Public Infrastructure

Repository ('*GDPIR*') to encourage knowledge sharing between countries implementing these technologies (G20, 2023). In collaboration with Pacific Islands governments, India could provide expertise, experience, and insight into lessons learned from its own DPI journey, so that the Pacific can quickly build a scalable and reliable fast payments system.

There are a number of challenges to building effective, inclusive, resilient, and instant payments systems in the Pacific. The demographic challenges caused by small, disparate populations with low economic resources and low financial and digital literacy are the most obvious. Other challenges include building critical infrastructure, such as undersea cables, in fragile ecological environments; lack of trans- and even intra-national interoperability; and a lack of uniform or harmonised regional regulation across financial systems, digital payments, cybersecurity and data privacy (Statham et al., 2021).

In certain ways, India has faced and overcome (or continues to tackle) similar challenges, and it is these commonalities which make it the ideal partner for the Pacific to develop their own capabilities. A clear example is the inherent weakness that Internet connectivity penetration poses for fast payments. Connectivity is still a major issue in the Pacific region, with only an average of 64% 4G and 81.4% 3G coverage (ibid). India partly circumvented this by providing an offline payment option through phone banking, however one party still has to be online, and is therefore not a substitute for connectivity.

Another chief challenge is data safety and sovereignty, but India Stack – and DPI more broadly – aims to be secure-by-design, and takes an *ex ante* rather than *ex post* approach to data sovereignty by ensuring that the protocols and architecture are federated, or at least controlled by an independent authority, while consumer data remains as decentralised as possible. India's Data Empowerment and Protection Architecture (DEPA) is not purely regulation (which does little to protect the consumer), and instead focuses on reprimand and restitution for poor data practices. Instead, it utilises a techno-legal model which gives individuals greater agency over their personal privacy and use their data in ways that empowers them (iSPIRT Foundation, 2023).

Another area where India has unique insight is the need for simple and effective systems that facilitate inbound remittances, given it is the highest global recipient of such remittances. The World Bank predicts that the total value of international remittances to India will be $100 billion in 2022, compared to $89 billion in 2021 (Ahuja, 2023). The gap between India and the next highest recipient is high, with Mexico receiving $54.1 billion in remittances that year (Kumar, 2023).

The integration of India's UPI framework with Singapore's PayNow system, as well as the financial systems of the UAE, Mauritius, Nepal, and Bhutan is expected to dramatically improve cost and latency of international remittances (ibid). As these developments are recent, however, data is yet to be collated on the existence and extent of any improvements in these corridors. However, research demonstrates that mobile money solutions like UPI, even accounting for transaction costs and cash-out fees, are significantly cheaper than other formal remittance channels (ibid).

India has struggled with many of the challenges that the Pacific Islands also face. In engaging with the Pacific Islands and Australia, India will be able to help bridge gaps in understanding created by these actors' markedly different levels of development, which may have contributed to disagreements and strained relations in the past. Meanwhile, Australia has the financial resources and familiarity with the region that India could use to better orient its investments and efforts at building this platform. Therefore, the complementary strengths of both states and their individual relationships with the Pacific Islands make this collaboration an ideal nexus for diplomatic, developmental, and digital leadership from all involved.

5. Policy Recommendation

The Union Government of India and the Commonwealth Government of Australia start a dialogue with Papua New Guinea and Fiji to establish a pilot program that helps to streamline, integrate, and modernise their payments system, based on India's UPI framework.

Papua New Guinea and Fiji

The introduction of a UPI system will need to have a solid value proposition for private sector actors, given the opportunity to develop end-user applications. Papua New Guinea and Fiji are amongst the largest sovereign states in the region (excluding Australia and New Zealand) by population and area (Central Intelligence Agency, 2023). There are already efforts underway in both countries to introduce digital identity, which is an important foundation for digital payments, like Aadhaar was for UPI.

The prominent players in financial systems in the region are also mostly present in these two countries, and their active participation in this scheme will be necessary. These are not only large regional banks such as the Bank of the South Pacific, but also MNOs like Digicel Pacific (now owned by Telstra Australia) and Vodafone.

Many will point to already established successful mobile money programs as justification that this renewed investment is duplication of effort. However, the lack of underlying payments infrastructure and investment cohesion means these solutions are stop-gap measures which address very specific issues, such as the Australia-Tonga remittance vouchers, or are constrained to a single market. In many cases, these initiatives are not sustainable because of thin markets in the Pacific and lack of private sector buy-in.

Conversely, this policy recommendation is that India and Australia work with the two Pacific Island countries with which they have the strongest ties respectively – Fiji and Papua New Guinea – to create an open, interoperable, and efficient payments network that can be used by government, banks and other financial institutions, mobile money operators, money transfer operators (e.g., Western Union), large and small vendors, and individuals.

India brings technical expertise and developmental experience with the transformative impact of constructing an effective digital payments system. Australia can use its strong and profound ties

through the Pacific, and its membership in regional fora to help advocate for this unique solution, and to be the primary listening post for Pacific Island countries' specific financial needs or concerns.

Costs and Sensitivities

In considering a practical policy solution, cost is nearly always the principal concern of policymakers, legislators and political leaders. In India, the creation of UPI required NPCI to spend $50 million in 2016, although this would be partly affected by its efforts to subsidise banks as a participation incentive (National Payments Corporation of India, 2016). While this provides a yard stick, the cost for the Pacific Islands would likely be higher given the need to integrate cross-jurisdictional infrastructure and provide not only direct financial support for the costs of constructing a UPI-esque system, but also the technical expertise and logistical support that these countries will need while they build their own capacity to maintain it.

These costs could be mitigated through the adoption of the 'DPI as a packaged Solution' (DaaS) model which is different from the 'traditional custom build' (TCB) approach [notwithstanding the oxymoron of a cutting edge field like DPI already using the term 'traditional'] (Varma et al., 2024). This would see fully packaged, easy to adopt, cloud-based, well-productised, modular solutions sold to countries with smaller populations, that can be rapidly deployed and easily maintained (ibid). This would reduce the long design, procurement and IT implementation of typical DPI rollout for smaller countries, which often do not have the economies of scale or adequate technological talent to build, operate, and maintain custom digital infrastructure (ibid).

The original proponents of this approach argue that all DPI pilot efforts could start with the DaaS model and be adapted into a more tailored solution as demands grew and evolved (ibid). Brief efforts to scope the costs of implementing this DaaS model have suggested that for states with population less than 10 million – such as in the Pacific – a pilot should not cost more than $2 million (Chaudhuri and Gupta, 2024). This would include the buildout of a particular technology asset, aligning local governance structures with a broader DPI framework, socialisation, and training in local jurisdictions.

The implementation costs might be higher than this predicted figure for the Pacific, but the DaaS approach could allow for solutions to be developed outside of the Pacific, in India for example, and deployed once efforts to upgrade physical infrastructure to the requisite levels were complete. The funds are already available and even earmarked for projects which would potentially fall under the umbrella of DPI. This could be achieved through a third iteration of the PFIP, FIPIC, the PIF, or with the support of the India-UN Development Partnership Fund or the Quad. Regardless, there are some important principles which should be considered for the governments of India and Australia when working with Papua New Guinea and Fiji on this pilot program.

The first is the importance of frank dialogue between all four states in implementing this solution. Australia has been accused of paternalism in past interactions, and so should be careful to understand the needs of Pacific states, especially given their markedly different economies and financial environments compared with Australia. Honest and open communication will be important for

identifying the preconditions for the establishment of a regional payments system, and for understanding stakeholders' specific strengths and weaknesses.

The second is narrative control, especially emphasising that – as opposed to other potential solutions or systems – a payments framework based on open protocols like UPI can help combat financial oligarchies or dependencies. It will need to effectively enfranchise private sector actors such as regional banks, other financial institutions, and MNOs and persuade them that this model will be more effective, holistically beneficial, and profitable in the long-term.

Finally, there should be a concomitant effort to strengthen regulation and governance around banking, financial systems, and digital privacy in the Pacific. Both India and Australia have built recent initiatives to build data sharing networks based on informed – the Data Empowerment and Protection Architecture, and Consumer Data Right respectively – although both are in their infancy (India Stack, 2024; Australian Government, 2024).

There is no shortage of literature or resources for regulatory development in the Pacific, and there has already been significant strides by major donor partners to help countries develop their legal regimes, including in these areas. These must also help to ensure that the Pacific countries hedge against money laundering ('*AML*') and terrorism financing ('*CTF*) risks, and comply with international standards in this manner. The reluctance of major financial actors to enter the region or scale-up their service provision is partly due to AML/CTF risk, which is a concern that will need to be addressed in order to remove barriers to their participation on this new platform (Davies, 2023).

6. Conclusion

The Pacific Islands are in desperate need of a tailor-made, interoperable, and efficient financial payments system which improves financial inclusion, reduces regional remittance costs, and enables more innovation and entrepreneurship in their communities. Although strides have been made in this direction, through bilateral and multilateral efforts alike, these are small solutions for specific problems and have reached issues when attempted at scale, or have suffered from a loss of economic or political support.

Australia has made a concerted effort to engage more openly and genuinely with the Pacific, while simultaneously also seeing its relationship with India strengthen and broaden as their respective goals for their shared region align. As the state with the premier development and diplomatic presence in the region, Australia is positioned to contribute through its own efforts for stronger cooperation with the Pacific Islands. It has access to funding designed to help drive development and infrastructure projects in the region, governance and technical expertise which can complement that provided by India, and experience in coordinating and facilitating implementation and monitoring in the Pacific.

India's domestic success with DPI, of which UPI is a prime example, has established it as a world leader for creative tech-driven solutions to development challenges. It is now looking to use this as a tool to help its fellow members of the Global South realise the same gains and benefits it has

experienced in recent years. The core principles of UPI and the issues it has solved for Indians align with the needs of the Pacific, and there is political will in India to increase its investment in the region, especially through DPI projects. Through this program, India will be able to lift millions of Pasifika people out of isolation and include them in the world economy, and serve as the seminal example of India's global leadership.

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Notes

[1]The National Payments Corporation of India is a not-for-profit company jointly owned and administered by the Reserve Bank of India and a consortium of India's leading banking institutions.

[2] Earnings Before Interest, Tax, Depreciation and Amortisation ('*EBITDA*')

[3] Figures refer to volume and value of UPI transactions in September 2023.

[4] The Quadrilateral Security Dialogue comprises India, Australia, Japan and the United States.

[5] Pasifika is the term used to broadly refer to the indigenous peoples of territories in the Pacific Islands.

[6] Blackbirding was a historical practice of forced kidnapping of Pasifika peoples and removal to Australia as indentured servants, predominantly on sugar cane plantations.

[7] The permanently inhabited US Pacific Territories are Guam, the Northern Mariana Islands, and American Samoa. The Compacts of Free Association govern the US relationship with the Federated States of Micronesia, the Republic of Palau, and the Republic of the Marshall Islands.

[8] The French external territories in the Pacific are New Caledonia, Wallis and Futuna, and French Polynesia.

[9] New Zealand has one Pacific external territory, Tokelau, and also has a free association relationship with the Cook Islands and Niue.

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IPPR

Commentary: Navigating Tensions and Stabilising Public Safety with Internet Shutdowns

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1. Introduction

Violence, ethnic clashes, and any form of social tensions that are likely to threaten public order may invite the imposition of temporary internet shutdowns as a precautionary measure by the Governments. The internet shutdown is an intentional disruption of internet-based communications in the region chosen for its implementation. Governments may resort to such measures on the basis that dissemination of fake news, rumour, and misinformation through internet access can fuel more violence.

Internet shutdowns in India are governed by the Temporary Suspension of Telecom Services (Public Emergency or Public Safety) Rules, 2017, framed under the provision of Sec. 5(2) of the Internet Telegraph Act, 1885. Earlier, such shutdown orders were issued under Sec. 144 of the Code of Criminal Procedure, 1973 (CrPC). The Telecommunications Act 2023 adopted similar provisions regarding the temporary suspension of telecommunication services in the interest of public safety following a public emergency.

Human rights groups have opposed the internet shutdowns, calling them a digital 'blackout' (Human Rights Watch 2023). There are recurrent discussions on the range of collateral damages – including citizens incurring economic loss, and adverse impact on education and health care services – due to network disruptions, alongside issues of curbing people's freedom to internet access. However, internet shutdowns remain a common practice during active conflict, protests, and events of political instability. And with the ascending frequency of social unrest, it is unlikely that the number of internet shutdowns will slow down.

As an example, the beginning of the year 2024 saw the protest called by the farmers' collectives, which immediately led to the "suspension of mobile internet services, bulk Short Messaging Services (excluding banking and mobile recharge), and all dongle services provided on mobile networks except voice calls" in several districts of Haryana and Punjab (Jagga 2024).

Public inconvenience can be an outcome of the actions taken before reaching the normalisation of the emergency. Moreover, it is observed that the mechanism of control of the internet could be

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intensely oppressive to segments of society who are socially and culturally vulnerable. Media reports have particularly highlighted the adverse effect of internet shutdowns during a conflict situation on women's safety, restricted mobility, and increased time lag in reporting violence against women (Chandran 2023). The question arises: while blocking information access and obstructing public connectivity, which is most essential to people who are already facing the consequences of the tensions, how will an assurance of public safety can be maintained?

This article emphasises that public safety alongside public emergency clauses used as a pre-requisite for internet suspension in India demands adequate attention, as it encompasses the core law and in the first place triggers the implementation of internet shutdowns—revisiting the term public safety is one of the major aims of this paper. Second, the paper tries to argue that despite the frequent use of shutdown measures there is a lack of clarity on the assurance of public safety by the Government. A recent Parliamentary Standing Committee report has discussed that Government in India has used internet shutdowns without assessing its impact on citizens and the economy and recommended a detailed study to assess its effectiveness in dealing with public safety and public emergency (Lok Sabha Secretariat 2023, 18) It further raised concerns that at present due to the lack of stipulated guidelines, the law enforcement agencies may resort to imposing telecom shutdowns on the basis of their own perceptions of disruptions in the law and order (Lok Sabha Secretariat 2023, 16). The discussion here does not aim to mark out a specific event, instead broadly examining the use of internet shutdowns as a policy measure during social unrest.

We start therefore by giving an overview of recorded numbers of shutdowns. The second section draws upon existing scholarly work to understand the digital public space. It argues for the protection of such space for an effective public safety outcome. To further guide the discussion and explore the applicability of public safety, we refer to the legal understanding and the observation report of a Parliamentary Standing Committee (2022-23) that was constituted for reviewing internet suspensions.

2. Growing Instances of Internet Suspensions: What's the Justification?

There are no official estimates available for tracking the trend of internet shutdowns. Based on web-based research, it is found that India has witnessed around 690 instances of internet shutdowns between 2012- 2023 (SFLC 2024). It is observed that, since 2017, the incidence per year has been high around 70-130 shutdowns (Singh 2023). The most explicit type of internet shutdown is the absolute blackout of services, but there could be other types such as speed regulation or slowing down the internet. The target group at the receiving end was usually a group of areas, like tehsils (subdivisions), or districts, and in some instances the entire area of Indian states.

Internet shutdowns have been implemented in most of the Indian states, with some surging much ahead than others to block communication services on the pretext of an approaching threat. Jammu and Kashmir have faced repeated shutdowns, counting to more than 442 up to 2023 (Singh 2023).

The impact that the internet shutdown can cause is not indicated by measuring the instances or location alone, as a lot depends on the duration. Following ethnic clashes, Manipur experienced a prolonged period of internet shutdown spanning more than 200 days in 2023 (Chakraborty 2023). At times, a few days of lifting the shutdown may be sanctioned, or district-wise normalisation may be carried out, depending on the government's assessment of the situation. Globally, India has acquired a prime position to rush to suspend internet access for prevention against internal security threats and maintenance of order, notwithstanding that there may be other reasons too.

In response to UN Special Rapporteur David Kaye's public consultation on internet access, a study found that the most-commonly cited official justifications for internet shutdowns worldwide are national security, elections, protests and demonstrations, and also prevention of unfair means during examinations. In many instances, transparency surrounding processes that led to the implementation of internet shutdowns was absent, and the governments may have broadly justified causes as public safety or maintenance work (Access Now 2016).

Observing the pattern of internet shutdowns in India from 2012 onwards, it is seen that these were more for preventive action than reactive action. That is, they were mostly used as a precautionary measure to maintain law and order, and only in a few cases were shutdowns a step taken after a specific incidence of violence. In 2023, out of 95 internet shutdowns, 81 can be categorised as preventive ones, and only 14 as reactive (Basuroy 2024).

It is observed that the administrative orders may be a copy-paste of language, without specifying the incident that occasioned the preventive act of shutdowns. A study of around 26 internet shutdown orders, issued in a span of a year between 2020 and 2021 by the Rajasthan administration, reveals identical content in each order (Bapat 2021). x Though protests and political instability may be an immediate cause, however, these terms are rarely used in the justification language (Bapat 2021; Pankaj 2022).

The Supreme Court, in *Anuradha Bhasin v. Union of India* (AIR 2020 SC 1308), has laid out a requirement to maintain procedural safeguards on how internet and telecom shutdowns are to be imposed. The reforms remain far away in the regulatory frameworks, including the recent Telecommunications Act, 2023, which glosses over the existing shortcomings of the previous rules. The Act does not elaborate anything in the section on procedural safeguards, only uses a vague official explanation 'as may be prescribed', and therefore without specific prescribed norms the aim may get further diluted in the process of implementation.

3. The Digital Public Domain

The digital space, which is the information and online activity space, has become a significant category of public space. Low and Smith (2006, 5) have discussed that the definition of public spaces is very complex. It can be identified as 'recognisable geographies of daily movement,' and include the internet despite its 'seeming[ly] spacelessness'. The digital space is no exception to other public spaces and demand appropriate public behaviour. Though digital spaces appear to be open and accessible to all people regardless of their social identity, its exclusionary nature cannot be ruled out.

Despite shortcomings, the number of active internet users stood at 759 million in India in 2021 and has been growing. Internet users engage in a range of activities, from online shopping (34%) and e-commerce (52%) to social media usage (70%), communications (77%) and entertainment (85%) (Kantar-IAMAI 2022).i This is evidence of an emerging active public life.

Scholars have also investigated whether the internet was evolving as a new 'public sphere'. A functioning public sphere is understood as a communicative space that 'can circulate information, ideas, and debates—ideally in an unfettered manner' (Dahlgren 2005, 148). Kumar (2015, 136-137) argues for the potentiality of the internet, particularly social media, and confers it with a special role in a democracy by its capacity to develop a network between citizens, and between citizens and the political class. A 'sense of public' may be created and may eventually convert into votes. Though the internet has led to some interesting changes in the way democracy works, and internet freedom is conducive for 'informed' and 'engaged' public to evolve, but the design of unrestricted internet access might be a misleading aspect. Most national governments are using internet to defend their interests, and for dissemination of information; in turn, they decide the controls, and the limits of user rights.

Democratic states agree to the freedom of political and social expressions until they do not catch the flavour of revolution and are transacted within the framework of approved ideas. What fits the boundaries of public discourses in the internet space and establishing rules of 'what is acceptable speech' is not only difficult but 'is inevitably political' (Ricknell 2020, 111). Scholars argue that limiting the understanding of internet freedom is a serious reductionism that denies the public of its rightful share of opportunities (Kumar 2015, 135). The issue of internet access is not only about rights and freedom; it is a matter of usage and needs. Access to the internet has arrived at an age beyond technological convenience; it is more of a dependency and a necessity.

A large majority of internet users access the internet through mobile devices, and this proportion is expected to grow manifold in the coming years. The mobile device users (phones and dongles) stand at around 847.17 million, compared to wired subscribers which is around 36.87 million, and fixed wireless subscribers at 0. 97 million (Telecom Regulatory Authority of India 2023). This aspect is important as the maximum shutdowns were targeted at mobile internet services, and only a few of them targeted both mobile and fixed-line internet services.

In the condition of shutdowns, the legitimised surveillance and information dissemination by the authorised platform companies gets curbed in the affected area. Studies discuss that without access to

the normal trusted sources of information, people may be willing to access any sources that are available, amplifying the scope of people moving to more unauthentic sources. This may leave people more exposed to harmful content, without the provision of fact-checking at the user's end (Shah 2021, 2695).

The regulatory shutdowns are often leaky and can be bypassed through human and technological backdoors. (ibid). Information is readily available on how to circumvent the local internet restrictions by connecting through Virtual Private Networks (VPNs). However, VPNs does not protect the users' privacy when browsing. (Elliot 2022). Misleading claims, distorted facts, or disinformation continue to remain active even after days of internet suspension, depriving the digital public space of authentic protection, with the possibility of a further dent in the mission of public safety.

Moreover, there are no significant studies globally that have objectively assessed how internet shutdowns have directly increased public safety, or if violence and security threats were curtailed by adopting shutdowns. Gohdes (2015, 367) has found that restricting information dissemination due to internet shutdowns have resulted in increased violence, as violent tactics are less reliant on effective communication in comparison to non-violent public dissent that relies on using the internet for organising grievances. Rydzak's (2019, 1) study on India also implies that the information vacuum during collective action as a result of shutdowns may compel participants to substitute non-violent tactics with violent ones. A critical mission of the temporary internet shutdown – to stop spreading propaganda – does not seem to have achieved much.

4. Balancing the Motive of Public Safety with Ground Reality

Public emergency remained a vague expression even after its use for decades, carried down from the colonial era. The terms 'public emergency' and 'public safety', not defined in the statute of the telecom suspension rules, tend to be stretched with concerns where these aspects may not be applicable. The Parliamentary Standing Committee admitted in its report that since public emergency and public safety are the only grounds for imposing internet shutdowns, and without a clear-cut definition, the gravity of its use by the State governments remains open-ended for misinterpretation. It came to be used in a purely subjective manner, relying on the ground situation assessed by the district officers (Lok Sabha Secretariat 2023, 46).

What might be an issue of local crime and routine policing were often given the nature of emergency and safety threats. The authorities have almost a free hand to determine the usefulness and applicability of shutdowns, and what they perceive as detrimental to public safety. There is a consistent emphasis on the issue of transparency and clarity, given that internet shutdowns are being used as an instant means for maintaining order. The need of the hour is to define the parameters of public emergency and public safety to rule out ambiguity in the decisions and actions of the State governments (Lok Sabha Secretariat 2023, 46).

The Supreme Court in *Hukam Chand Shyam Lal v. Union of India and Others* (AIR 1976 SC 789) has specified that any other kind of emergency is not to be confused with a public emergency. Further, in *People's Union of Civil Liberties v. Union of India* (AIR 1997 SC 568), the Court distinctly mentioned that a public emergency must be declared only when there is a prevailing condition affecting the people at large, subject to overcoming it with an immediate action.

Anuradha Bhasin v. Union of India (AIR 2020 SC 1308) was a landmark judgment on the question of internet suspension. It revisited the Hukum Chand Shyam Lal case to observe that public emergency is to be determined as 'sudden and its consequences are grave', primarily subject to the interest of public safety, and concerns the security of the State.

In much earlier pronouncements, the Supreme Court in *Brij Bhushan and another v. The State of Delhi* (1950 SC 605) established that public safety acquired a well-recognised meaning juxtaposed with the maintenance of public order. To observe a deeper sense of the term, the court distinguished it with public 'unsafety', which is to be usually 'connected with serious internal disorders and such disturbances of public tranquillity' that 'jeopardise the security of the State'.

In *Rajeev Kumar @ Monu Shukla v. State Of U.P* (Writ - C No. - 31473 of 2019), the Court clarified with the support of previous pronouncements that public safety does not mean any ordinary disturbance of law and order, rather it means the safety of the public at large.

The courts have broadly interpreted public safety as something that affects the community at large and is indispensable to the larger social interest. Maintaining public safety is a legitimate state concern. However, actions towards its implementation must carry safeguards that protect the interest of both the state and the public, whom the state seeks to protect. By the precedent of the Court cases, one may say the terms public emergency and public safety must not be used as a blanket mechanism. Any authority determining if any situation involves a threat to the public order must carry accountability for a responsible decision. The Supreme Court's guidelines allow discretion to governments with certain limitations.

It can be inferred that public safety is not as ambiguous as the legislative rule treats it to be. The use of the term must be seen in a 'means and ends' spectrum. Following legal and Committee report discussion that warned against the subjective notion of public safety authority must make assessment of the presence or apprehension of 'danger' to public safety. Indicators can be devised by examining the First Information Reports (FIRs) showing serious damage to public utilities and threats to public peace (Chatterjee 2020, 9). In the aftermath of imposing the shutdown, to prevent any further danger to public safety, caution must involve ensuring the utility services and government assistance are within reach to people, primarily if it is a conflict-ridden situation.

Public safety' is seen for more than a hundred years of law as government protection of persons or property from sudden and violent injury, but it often gets narrowly defined as physiological protection. With the expansion of the protection aspect to include well-being as per the development goals, any threat to basic needs and opportunity worthy of protection must encompass public safety (Friedman 2021, 13-19).

In an attempt to reimagine public safety applicable to the scope of growing public needs, experts have discussed the practical necessity of online network platforms between community and law enforcement agencies, among other measures, to enable effective public safety (Prabhakar, Gupta, and Mehrotra 2015). It can be argued that the public safety clause needs more strengthening, which otherwise weakens due to an emergent situation of tension and unavailability of information services due to the shutdowns.

The shutdown debate is often weighed by considerations of freedom versus safety. Both aim at keeping the public at the central point, so either way, neither should be easily compromised. Owing to the limited capacity of government monitoring mechanisms, internet shutdowns may amplify threats to safety, due to heightened vulnerability during a public emergency. It is widely discussed that internet shutdowns seriously hamper real-time reporting and obstruct the coordination of agencies and the public. For example, unless the public is prepared in advance for the emergency, the people may find difficulty to seek government helplines, given the reliance placed on the internet for information scouting.

Experts have suggested democratic gatekeeping is a viable option, where platform companies strictly filter or delete undesired information in the areas affected. The most agreed consensus from all quarters is that internet shutdown measures must be used as the last resort rather than the first for public safety intentions, and only after a thorough assessment of conditions inciting public emergency at the conflict-hit sites.

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Notes

[i] The data recorded is for a year on all segments. Online shopping refers to shopping through Amazon, Flipkart, etc. E-commerce is measured by access to online shopping, online finance, online travel, etc. Social media refers to those who have accessed content on social media websites or platforms. Communication means those who have done text/ voice/ video chat or used email, video conferencing, etc. using an online website or app. Entertainment covers those who are either Online Video Viewer, or Online Music Listener, or Online Gamer (Kantar-IAMAI 2022).

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IPPR

India Cannot Afford to Ignore Manufacturing

Review article based on "Breaking the Mould: Reimagining India's Economic Future" by Raghuram Rajan and Rohit Lamba.

Sridhar Krishna*

At a time when India is deeply polarised and when facts seem to not matter, Raghuram Rajan and Rohit Lamba attempt to show willing Indians a mirror. This is not to say that the authors' political leanings are invisible; that said, the authors do support many of their arguments with facts and logic.

The question in many people's minds a decade after the NDA came to power – and a few months before the 2024 election – is whether the fabled *"Acche Din"* are here.

The authors make no bones about what they think: we are not there yet and will not be there soon. As they clearly say, while India is the fifth largest economy by GDP (2022), and is the fastest growing economy among the G20 (Trading Economics 2023), it is also the poorest country by per capita income among the G20 (Trading Economics 2022).

Once the authors make it clear that *"Acche Din"* are far away, they go on to point out that the direction India is taking may not get us there soon. At her current pace of growth, she will not even reach China's current per capita income by 2047.[i] The authors suggest that India's posturing in the world stage as a superpower needs to be moderated by facts. Such posturing may have some positive domestic impact on the electorate but may not suffice to reach our economic goals in this manner.

The authors bring a fresh perspective to the discussion about the direction India should take towards becoming a developed country by 2047, the hundredth year of India's independence. They say focus on education, grow in services, devolve more power and resources to local government, and build good relationships with other countries to de-risk our supply chains and promote peace.

Manufacturing vs Services

The authors question the obsession with manufacturing as the way to grow India's economy. They argue eloquently that it is intellectual property and services that gives Apple a $3 Trillion market capitalization while manufacturing prowess gives Foxconn, the company that makes all the iPhones, only a market capitalization of $50 Billion. This seems to suggest that if India focuses on manufacturing competitiveness at the cost of services excellence, it would be highly inefficient.

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The authors suggest India should try to become for services what China became for manufacturing. (Khan 1997) However, it is important to note that services as a share of global trade is still quite small, at 23% (UNCTAD 2023), and growing exports in services will take a long time.

The enormous number of unskilled youth seeking jobs in India could benefit from a growth in manufacturing jobs. Devashish Mitra writes in detail about the low education levels of youth in India, and strongly argues that their lack of higher education and low skill levels makes them prime candidates for jobs in labour-intensive manufacturing and not services jobs. (Mitra 2022)

China's manufacturing output is over 10 times that of India, at $4.98 trillion while India is at $456 Billion. (Manufacturing value added by country 2022) The developed world has been using China as the preferred source of manufactured goods for a long time, but now seeks an additional source. (Reuters 2023) This could be a real opportunity for India to gain some market share from China.

The other — and potentially more important — trend is that "India and some of the developing countries are becoming more prosperous". (The World Bank in India 2023) There is a vast market which has been deprived of goods due to poverty; as these economies are emerging from such destitution, the demand for manufactured goods could grow locally. The authors seem to ignore the opportunity to tap into this demand and be a preferred supplier of manufactured goods to the developing world. Given the need for creating large scale employment in India and the still untapped potential for manufactured goods exports, India cannot yet afford to ignore manufacturing.

Nevertheless, it is possible and desirable for India to look at high-end services like chip design, while also making it possible for large scale low-skill manufacturing to grow. The authors claim they are not against growth in manufacturing, but question the large subsidies given by the government for creating manufacturing jobs – for example, subsidies to the tune of ₹16,500 crores given to Micron in Gujarat for assembling and testing chips. They calculate that these subsidies amount to spending ₹3.2 crores for creating one job, since only 5,000 jobs will be created by Micron through this effort.

While it may be prudent for the subsidies to be in line with the number of jobs created, the authors fail to highlight the other benefits of building capabilities in high-end electronics. There is a strategic need for India to build capability in multiple stages of the chip supply chain, and this is one viable way of building that capability. Government-owned companies like Semi-Conductor Laboratories (SCL) have not seen remarkable success in this endeavour in the ~4 decades of their existence. (Economic Times 2023). Subsidies to those who have demonstrated capabilities in the chip supply chain can kickstart the effort in our country.

The 2023 Future of Jobs Report by the World Economic Forum (The Future of Jobs Report 2023) indicates that the jobs of the future are not in manufacturing but in services.

The areas in which India is strong, namely trade in computer services, have been growing even more rapidly than all services, at 10% p.a., according to the same report. With technological advances in digital, "sections of services such as those in education, health and environmental services could see a significant rise" according to this report.

Growth in services will require Indians to upskill themselves very significantly. The authors suggest that the government should invest more in higher education. However, upskilling efforts are not a one-time investment but rather a continuous process, as technology makes one set of skills redundant and others desirable.

In this context, this author had contributed a piece on career impact bonds and how it could help finance the upskilling efforts of a large population. (Krishna 2021) This involves providing people desiring new skills with an "at-risk" loan, to procure training in these skills, repayable under certain conditions (getting a job, earning more than a certain amount of money, etc.) These loans are pooled and structured into career impact bonds with multiple tranches. The tranches which are less risky may see investments from financial investors, while the riskier tranches could use money from the government, CSR funds of companies, and the training institutes themselves. The financial markets will ensure money goes towards training programmes and training institutions that help students get good jobs.

International Relations

India's trade policies and diplomacy need to also focus more on agreements around services with our trade partners. However, "failures to advance multilateral and regional trade integration through Trade in services Agreement (TISA)" (WTO 2023) adds to scepticism that India can grow quickly in services trade.

While India has had troubled relationships with China and Pakistan for decades, she currently has the worst-possible relationships with all her neighbours. The authors cite the case of Bangladesh, where some of India's majoritarian politicians have targeted Bangladeshi immigrants with abuse. They point out that China's increasing influence in Nepal, Sri Lanka, and even Bhutan is making it attractive for these countries to keep India guessing about their alignment when faced with a muscularly nationalistic India.

Nitin Pai, in his blog, talks about how India's interests are best served by selectively aligning with either the United States or China by issue. (Pai 2010) Similarly, it is in the interest of many of India's neighbours to align with India or China selectively by issue. The authors may be reading too much into this, but India would do well to make more friends in her neighbourhood.

The authors claim our desire to coerce and even insult other countries, to try and cow them, resembles the "Wolf Warrior" approach taken by parts of the Chinese establishment. They feel our efforts at chest-thumping could be counterproductive and are premature. Too much chest-thumping could lead to fears from the developed western world that India is another aggressive China in the making, and this could scuttle our efforts to become a developed nation ourselves. This would not be a favourable outcome for India and India should walk the tight rope of diplomacy between aggression and assertiveness.

Governance and Decentralisation

The authors point out that India is a large country – the most populous in the world – and needs more decentralisation, not less. Poor state capacity is a big problem. The number of government and public sector employees is low and has been going down. India has less than 4.5 civilian employees per 1,000 population according to the authors. In comparison, they point out the US federal government has 8.07 civilian employees per 1,000 population. When one looks at local government, in the US and China, two-thirds of the government employees are in the local government, but in the case of India, only 12% of government employees are in the local government.

As per the 2011 census, 69% of India's population live in rural areas. (Press Information Bureau 2022). The government had made big promises about doubling farmers' income. The reforms to farm laws might have been beneficial to farmers, but the inadequate quality of effort in explaining the benefits of the bill led to long and widespread protests, eventually leading to the withdrawal of the bill. Subsidies to agriculture through fertiliser subsidies, free power in many states (GOI 2021) and free water have distorted the market, and – according to the authors – have not been efficient or effective.

The authors make a convincing case for further devolution of powers and resources to the states, and then to the local district and panchayat levels. This, they feel, will create greater accountability and efficiency in the delivery of public services and goods, tailored to local needs.

Education and Healthcare

The authors compare many of the subsidies given to promote manufacturing and even agriculture with budgetary allocation for primary and higher education and try to make a case for greater investment in education. They point out that the subsidies given to Micron was 50% of the entire education budget.

This is indeed a key point of great concern. India's spend on education as percentage of GDP is very low, at 2.9%. (Bhattacharya 2024) In comparison, the United States of America spends 6% of its (substantially higher) GDP on education, and the United Kingdom, 4.2% (on a significantly smaller population). The authors feel the money will be better spent on education than on many of the above subsidies. India does require a much higher spend on education, but it is more than just money. Ensuring greater accountability of teachers in government schools can be achieved, according to the authors, on devolution of authority and budgets to local bodies.

Freedom and culture

Lastly the authors talk about a culture of freedom of thought and expression to create an environment of innovation and progress. A culture of innovation is required to drive research and development. This is also required to achieve and maintain competitiveness in every sphere of work.

The authors question whether a regime which seems to tolerate no dissent will be able to foster innovation. The authors doubt India will be able to see the return of many of its highly qualified engineers and scientists from the US and other countries unless there is a culture of freedom. Some may argue that an authoritarian regime like China has succeeded in attracting their talent back to their country, and almost 46% of all global patents filed were from China, but the authors make a valid argument that long-term innovation and progress will require freedom of thoughts and expression.

Overall, this is a delightful read, with many things to think about even if one does not agree with all of them.

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Notes

[i] If we grow at 6% per annum, in 24 years our per capita GDP will quadruple and at $10,000 it will still be less than $11,560 (Trading Economics 2022) which is China's GDP today.

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