COMMENTARY ON INDIA'S ECONOMY AND SOCIETY SERIES

22

Panel Discussion on Union Budget 2022-23

R. Nagaraj

M. Parameswaran

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CDS

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India's Economy and indeed its society has been undergoing a major change since the onset of economic reforms in 1991. Overall growth rate of the economy has increased, the economy is getting increasingly integrated with the rest of the world and public policies are now becoming very specific compared over arching framework policies of the pre-reform period. Over the past few years, a number of important policies have been enunciated, like for instance the policy on moving towards a cashless economy to evolving a common market in the country through the introduction of a Goods and Services Tax. Issues are becoming complex and the empirical basis difficult to decipher. For instance the use of payroll data to understand growth in employment, origin-destination passenger data from railways to understand internal migration, Goods and Services Tax Network data to understand interstate trade. Further, new technologies such as Artificial Intelligence, Robotics and Block Chain are likely to change how manufacturing and services are going to be organised. The series under the "Commentary on India's Economy and Society" is expected to demystify the debates that are currently taking place in the country so that it contributes to an informed conversation on these topics. The topics for discussion are chosen by individual members of the faculty, but they are all on issues that are current but continuing in nature. The pieces are well researched, engages itself sufficiently with the literature on the issue discussed and has been publicly presented in the form of a seminar at the Centre. In this way, the series complements our "Working Paper Series".

CDS welcomes comments on the papers in the series, and these may be directed to the individual authors.

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CENTRE FOR DEVELOPMENT STUDIES
(Under the aegis of Govt. of Kerala & Indian Council of Social Science Research)
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Every year the Centre organises a panel discussion on the Union Budget setting it in the background of the Economic Survey. The panel discussion on the budget 2022-23 was organised on 2nd March 2022. The panel included Prof. R. Nagaraj, Dr.M. Parameswaran, Dr. Hrushikesh Mallick, Dr. Chidambaran G Iyer and Prof. Sunil Mani. It was moderated by Prof. K.N.Harilal. The presentations this year focused on a set of selected themes such as the Public Investment-Led Growth Strategy, Inflation, Finances of the Central Government, External Sector, and Technology and Innovation Issues.

The decision to organize every year a panel discussion on the Economic Survey and the Union Budget after nearly a month of their presentation in the parliament was a conscious one. The interim period will facilitate a fairly detailed analysis of both the Economic Survey as well the budget papers. It has the added advantage of knowing the initial response from various stake holder groups as well as the immediate post budget developments within India and outside.

This year the budget was presented knowing well that there would be major developments within the country and in the world system that might critically affect the budget estimates and expectations. Although it was not made too explicit, there were several observations in the Economic Survey that suggested the possibility global economic headwinds that are likely to upset the fiscal and monetary balance in developing nations like India. International financial institutions such as the International Monetary Fund have also been drawing the attention of the policy makers to some such systemic developments that are likely to change the global economic balances. The developments in the initial months of the year prove the apprehensions true. The building up of inflationary pressure in several countries including the developed ones, the Russian invasion of Ukraine, the upward pressure on oil and other commodity prices, global liquidity tapering, the threat of reverse flow of capital from developing nations, etc., were not completely unexpected. In a way it also explains why the Union Budget, in spite of the rhetoric, had steadfastly stuck to the well-known conservative limits. In fact, this point was made very clear by the presentations of the panelists as well as the participants from the floor of the CDS discussion.

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The Strategy of public investment-led growth

R. Nagaraj

The Union Budget starts with a self-congratulatory announcement that India's domestic output (GDP) is likely to grow 9.2% this year (2021-22) over last year — the highest among the world's large economies. What is unsaid is that India's output contraction the previous year (2020-21) was among the worst in the world. Compared to the pre-pandemic year (2019-20), the current year's GDP will be marginally higher by 1.3%, as per the Economic Survey. If the adverse effect of the ongoing wave of the Omicron virus is factored in, the (estimated) modest rise in GDP may vanish. Thus, it is worth starting with the factually accurate picture that India lost two years of output expansion. In other words, per capita income today is lower than it was two years ago. Regarding sources of demand, the share of private consumption declined by three percentage points of GDP between FY2020 and FY2022. The Government stepped up its expenditure to mitigate the decline, but only modestly; hence, the marginal output expansion. In contrast, the United States boosted public spending by about 10% of GDP, and its output roared back!

This year's Budget seeks to boost public investment by 35.4% at current prices over last year to raise its share in GDP to 2.9% from 2.2% last year. With grant-in-aid for state investments, the Budget hopes to increase public investment share to over 4% of GDP. The Budget hopes to trigger a virtuous investment-led output and employment growth by arguing in favour of the "crowding-in" effect of public investment on private investment. The theory is sound and is a welcome change from the past policy stance. The crux will be to mobilise resources to finance the investment as the Budget seeks to reduce the fiscal deficit ratio, as per the schedule laid out in the last Budget. The critical question is whether additional tax and non-tax revenue (that is disinvestment proceeds) will be sufficient to finance the investment plan.

To refresh our memory, last year too, public investment was sought to be raised by about the same proportion (34.5%). I had written, "These figures certainly look impressive. The realisation of these investments would crucially depend on tax revenue realisations, disinvestment proceeds, sale of rail and road assets and the Government's ability to raise resources from the market, without raising interest rates for the private sector." (https://bit.ly/3AWzxKP) It is ditto and holds for this year as well. Indeed, public investment has picked up in the current fiscal, by barely 0.2% of GDP. With the threat of higher (imported) inflation (on account of rising international oil prices) and rising interest rates (on account of the US Federal Reserve's decision), meeting the ambitious investment target would be challenging, but it is worth attempting.

On the employment crisis

But the larger question is: how will it address the sharp decline (of three percentage points of GDP) in private consumption, which is likely to be caused by loss of employment? The derived demand for labour from an infrastructure boost may be limited, as the suggested projects are machinery intensive, not labour intensive. The Budget does not directly address the employment crisis caused by the novel corona virus pandemic and the lockdown. The employment crisis would call for enhanced allocation for the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and initiating a similar scheme for meeting urban unemployment. Instead, shockingly, the Government has slashed the allocation for MGNREGA by 25% over last year.

Industrial slowdown

The manufacturing sector’s share in GDP has been stagnating at around 15% of GDP for quite a while. The annual industrial growth rate has sharply slowed down from 13.1% in 2015-16 to minus 7.2% in 2020-21. Perhaps a most telling example of the industrial slowdown is the fall in two-wheeler sales. As per news reports, it fell to 11.77 million units in 2021, below 11.90 million units sold in 2014. Expectedly, employment has contracted, most of which in the informal or unorganised sector. Lack of demand is the real problem, with low capacity utilisation. Indeed, the proposed public investment would create demand for capital and intermediate goods. But if a substantial share of such investment “leaks” out as imports, then the industrial output may not get the desired boost.

It is essential to appreciate that India has become an import-dependent economy, especially on China. Despite the clarion call for Atmanirbhar Bharat, India’s imports have shot up. Research reports show that India’s trade deficit with China has gone up from $57.4 billion in 2018 to $64.5 billion in 2021. The figure would be much higher by China’s official trade account. And the deficit would be even higher if exports from China and Hong Kong to India are combined.

Premature on PLI scheme

India launched a production linked incentive scheme (PLI) for numerous technology-intensive products, starting with mobile phone assembly a few years ago to augment production and reduce imports. The Budget has mentioned the overwhelming response to the scheme. However, evidence on the number of such projects that have taken off, their investment and employment generation and rise in domestic content in such industrial units is too sparse. Hence, it is premature to claim the success of the PLI scheme.

India launched the “Make in India” initiative in 2014-15 to raise the manufacturing sector’s share in GDP to 25% and create 100 million new jobs in the industry by 2022. However, the Government diagnosed the principal barrier to increasing manufacturing in India as excessive and dysfunctional regulation holding back the private initiative.

The solution, it was argued, was to improve India’s rank in the World Bank’s Ease of Doing Business (EDB) index. India did splendidly to improve its rank — from 142 in 2014 to 63 by 2019-20. But the improved ranking failed the industrial sector miserably, with a steady slowdown, noted above. Last year, the World Bank scrapped the index as it was flawed globally and reportedly politically motivated (https://bit.ly/3HlaWSm).

Yet, the present Budget harps on improving the EDB index and reducing regulatory constraints on industry and infrastructure to boost growth. It appears shocking as the Government refuses to learn from past mistakes.

To sum up, the Budget for 2022-23 is a bold effort at public investment-led growth — quite similar to last year’s. The widely discussed concerns of the unemployment crisis, fall in the share of private consumption in GDP, and rising economic inequality (caused by the pandemic and the lockdown) have been barely mentioned in the Budget. Instead, the Budget pins its hope on investment to boost employment, as derived demand for labour. Without fully committed funds for capital investment, the success of the ambitious effort remains questionable.

Trends in inflation and implications for budget estimates

M. Parameswaran

The chapter titled "Prices and Inflation" in the Economic Survey discusses the trends in inflation during the financial year under consideration. Among other things, the chapter attempts to account for the observed trends in headline inflation in terms of inflation in the component price indices, namely food price and energy and fuel. Here, the Survey observes that Consumer Price Index-Combined (CPI-C) inflation in India moderated to 5.2 percent in 2021-22 (April-December) from 6.6 percent during the corresponding period of 2020-21. The decline in the headline inflation is mainly due to the reduction in food price inflation, which declined to 2.9 percent in 2021-22 (April-December) from 9.1 percent in the corresponding period in 2020-21. This decline in the food price inflation is attributed to the relaxing of the supply disruptions caused by the pandemic and the associated lockdown. However, here I would like to add that the headline CPI inflation in India crossed the upper bound of 6 percent set by the flexible inflation targeting strategy before the onset of the pandemic and the associated lockdown. This was also driven by the increase in food price inflation. The annual food price inflation increased from 0.7 percent in 2018-19 to 6 percent in 2019-20, and further to 7.3 percent in 2020-21 (see: Balakrishnan and Parameswaran 2021 for more details)[1].

Given the higher share of food and beverages in CPI-C, it is not surprising that the food price inflation is actually driving the overall inflation. In addition, food price inflation can propagate future inflation by increasing the wage cost due to increased food prices. When we examine the trends in inflation during the last ten years, we can see that inflation was driven by commodity prices, mainly food prices, whenever food price inflation is lower, headline inflation is also lower (see: Balakrishnan and Parameswaran 2021 for more details). A recent study from RBI[2] gives further evidence on this. The study shows that Philips curve in India is flat since 2014, implying that inflation is not driven by the overheating of the economy, as postulated under the New Keynesian Philips Curve (NKPC), the basis of inflation targeting strategy. The fact that inflation is driven by the commodity prices gives some room to RBI to follow accommodative monetary policy. However, the recent developments in the world economy could force the RBI to change its stance on monetary policy. Inflation pressure in US and other developed countries is mounting and US Fed already announced its intention to increase the policy rate. This along with the increase in the crude oil price in the context of Russia-Ukraine conflict implies further escalation in the global inflationary pressure and consequent increase inflation in India also. All these suggest that RBI won't be able to continue the easy monetary policy to help the revival of economic growth. These developments further imply that the growth calculations and inflation rates on which budget estimates are based can go awry.

[1]Balakrishnan, P. and Parameswaran, M. (2021), *What Lowered Inflation in India: Monetary policy or commodity prices?,* Working Paper, No 66, Ashoka University Economics.

[2]Patra, M. D., Beheraand, H. and John, J. (2021), Is the Phillips Curve in India Dead, Inert and Stirring to Life or Alive and Well?, *in:* '*RBI Bulletin*', Reserve Bank of India, , pp. 63-75.

Another point caught the attention of the observers is the divergence between WPI inflation and CPI-C inflation. Because of the different commodity composition and weighting of commodity groups, we cannot expect that WPI inflation and CPI inflation move together. However, since commodities sold in the wholesale market are ultimately getting into the retail stage, we can expect certain co-movement of these two measures of inflation. The Economic Survey notes that till April 2019, these two measures of inflation were more or less equal and were moving together, but since then they diverged from each other. Till February 2021, WPI inflation was lower than CPI inflation, but since then the WPI inflation overtook the latter. For instance, in December 2021, WPI based inflation rate was eight percentage points higher than the CPI based inflation. This divergence in the movements of the relevant price indices in the country raises many important issues. Is it due to the very weak demand in the economy or is it due to the decline in the price-cost margin? Such questions will hopefully attract researchers as well as policy makers as we go on.

Government Finance

Hrushikesh Mallick

The budget envisages salubrious impact both at macro and micro levels. Its main goals are to raise the long term economic growth potential by undertaking major infrastructural development projects and promotion of welfare at the micro level by launching more inclusive development programs. It presents a futuristic vision (sets the agenda over a long term) over 25 years' time horizon from now depicting it as AmiritKal, so as to realise the transformative potential and sustainable development of the economy. It tries to simplify regulatory norms of the centre and align them with the state governments to reduce the regulatory distortions towards a more investment friendly (greater ease of doing business) regulatory regime for boosting up private investment on the one hand and ensuring better living conditions for the citizens/residents on the other.

Fiscal Policy Sustainability

The financial situation of the central government including the states has been worsening since the pandemic year 2019-20. Before the start of pandemic, debt to GDP ratio and fiscal deficit to GDP were stabilised relatively at lower levels both for the centre as well as for states. The debt to GDP ratio of the central government was 45% in 2018-19; it reached to 49% in 2019-20 and increased further to 59% in 2020-21. If one adds state's debt to GDP of around 31% in 2020-21, the combined debt to GDP for the year touches 90%. The combined debt GDP ratio has increased further in the current financial year. The borrowing requirement for the centre is projected to increase by 4.4% in 2022-23 over the revised figure. Interest payment of the central government in relation to its tax receipts is projected to increase to 48.61% in 2022-23 from 47.60 in 2021-22. That means for very rupee earned in taxes by the centre, almost half is going towards meeting interest payment alone and another 50% has to be spent on other committed expenditures such as defence and salaries. When interest payment is taken as a percentage to total revenue expenditure, it is projected to reach to 29.44 % 2022-23 from 25 % in 2021-22 (as per revised estimates). The pattern change outlined here no doubt raises serious concerns regarding fiscal sustainability.

Welfare versus Efficiency

More revenue expenditure means more welfare for citizens while greater capital spending results in greater productivity or efficiency of government expenditure which can significantly determine the long term growth of the economy. In continuation with last year's budget, in this budget, the government has earmarked greater amounts of resources for capital projects such as PM Gati Shakti in 7 critical areas such as roads, railways, waterways (ports). This would improve the competitiveness of the economy by reducing the cost of private investment. It would induce private investment, both domestic and foreign. Since capital spending involves massive construction projects and given that construction sector is labour absorbing, it would generate employment as well.

Allocating greater amounts of resources is good for a developing economy which is transitioning to achieve higher economic progress. Although the government has increased capital spending by 24.47% in 2022-23 over 2021-22, it was much lower than the hike of 41% over 2020-21. Further, from an overall economic perspective, this year's capital expenditure allocation is less than 3 percentage of GDP. The overall expenditure to GDP was 16.34% in 2021-22 and for the coming fiscal it is projected

to be at 15.30% implying an overall reduction in government expenditure. But the real question before us is regarding te adequacy of the allocation for meeting the future infrastructure needs of the economy, which has been experiencing rising population, and severe infrastructural bottlenecks. What is the optimality of capital spending requirement in each annual budget to meet any targeted infrastructure expansion? Obviously, the economy needs massive public infrastructure investment support for unleashing income and employment growth. But, the year to year fluctuations in the allocation for public investment suggest persistence of ad-hocism and of course lack of long term planning.

We have been hearing in each budget presentation that the FM increases the expenditure on education and medical facilities but on the contrary, there exists unavailability of proper health and medical facilities in government hospitals and unavailability of good doctors in different parts of the country. The gap between what is said and done is clear from the exodus of Indian medical and nursing students to foreign destinations including Ukraine and China. This exposes the reality of deprivation of the majority, in spite of having the required qualifications, and privileging of the few. It is about access to quality education in many areas at affordable prices for many middle and poor class people which could benefit the nation at large.

Further, when it comes to addressing the short term stability or growth rate of the economy, the budget should not have restrained the current expenditure from its expansion at least in this fiscal. The economy is in the midst of recovery where the private investment has fallen even prior to the pandemic along with falling private consumption. The drastic cut down of revenue expenditure especially on major subsidy programs such as fertiliser, food, petroleum and gas would have effects on welfare and reduce consumption spending and thereby delay recovery of the economy. Probably the government could have maintained the fiscal deficit at its previous years' level and allow a faster recovery path so as to meet its targeted longer term growth objective. The short term economic stability is very vital for attaining long term growth stability. In fact, greater buoyancy in tax revenue realisation like last year would help bring down the fiscal deficit to GDP ratio unchanged. However, while saying so I am not suggesting for continuation of subsidy long into future, which is unproductive and growth retarding.

Unemployment and Inequality

India is already a highly uneven society in terms of the distribution of income, where top 1% population earn 22% of the national income, while the bottom 50% of population earn only 13% of national income (World income inequality report, 2022). By cutting down the transfers to the people and other revenue expenditures, in the context of massive unemployment, would only accentuate inequality in a highly unequal economy.

India meets 80% of its energy requirement (crude oil and petroleum products) by importing from outside. In the present scenario of upward spikes in international petroleum prices and the volatility of Rupee (and the international fallouts like Russian invasion of Ukraine) India is likely to experience greater imported inflation. This inflationary pressure may further worsen the uneven distribution of income.

Rhetoric and Reality of Fund Allocation

The budget allocations do not match the government's rhetoric on employment generation. This year's budget has envisaged a lot of new initiatives but the funds allocated do not match the declared objectives. A good example for this is the skilling India initiatives. Investment on renewable energy and rural development are also too short to meet the stated goals. The budget cuts down spending on MGNREGA program citing ghost accounts and non-transparent expenditures, instead of making the scheme more transparent and productive. Vocational education and skilling program for the youth are very critical to absorb unemployed youth, but the allocation has been reduced compared to the previous year. It announces courses through e-learning or e-skilling but one has to assess the efficiency of these e-skilling programs in comparison to learning programmes based on physical presence of learners.

It talks about energy transition and climate action which are important steps in the direction of the global climate action policy of the UNO. But the allocation to support the pronouncements fall short of expectations. It raises the question whether India has already met its renewable energy targets from various renewable energy sources or has it encouraged the private sector adequately to explore and tap renewable energy sources, while other neighbouring Asian countries (like China) have been making remarkable progress in their energy and environment goals. The budget emphasises financial inclusion measures. By extending the core banking facilities to the post offices, it will create an opportunity of financial inclusion at the grassroots or rural levels. But greater financial inclusion is possible by making the people capable of developing their own livelihoods and finding employment opportunities, which are crucial for long term growth and inclusive development. Although a variety of novel ideas were presented in the budget, how many of them are finally translated into actual practice will depend on the commitment for and quality of implementation.

External Sector

Chidambaran G. Iyer

The aim of this note is to summarize the view of the external sector as per the Economic Survey (ES) of 2021-22 and then contrast it with the announcements made for the external sector in Budget 2022-23. We begin by delineating the external sector as portrayed by the ES, which is followed by the budgetary announcements, and finally a short assessment.

Economic Survey

Revival in global economic activity helped Indian merchandise exports recover and register positive growth. One of the reasons, as per the Economic Survey (ES), is an aggressive export push by the government, which it later explains as resolution of procedural issues to enhance ease of doing business. Given the delay in declaring the rates of the Remission of Duties and Taxes on Exported Products (RoDTEP) scheme, this conclusion is debatable. Rise in exports is contributed by the rise in petroleum products (around 15 per cent in 2021-22 (April-November)). In fact, the top 10 products comprise almost 47 per cent of the export basket; in addition, seven countries account for more than 40 per cent of India's exports. Thus, there is scope for diversification in terms of products as well as destinations, which as per the ES should be achieved through the free trade agreements both signed as well as currently under negotiation. Another initiative in this direction is the District Export Promotion Committees (DEPCs) that have been set up in each district, and products with export potential have been identified in all 739 districts across the country. The ES mentions that the government has through the Export Promotion Capital Goods Scheme (EPCG) incentivised domestic procurement of capital goods.

On the imports side, electronic items, vegetable oils, and computer hardware together constitute almost 10 per cent of the imports in 21-22 (April-November). Among others, India has a positive trade balance with USA, Bangladesh, and Nepal; while we have a trade deficit with China, Iraq, and Switzerland.

Service exports particularly, computer, business and transportation have performed impressively. These three services also constituted a majority of the service imports. In current US $ terms, India continues to be the largest remittance recipient in world in 2021. The higher net invisibles due to higher net services receipts and private transfers pitted against a sharp increase in merchandise trade deficit resulted in a current account deficit at 0.2 per cent of GDP in the first half of 2021-22. This deficit was countered by robust capital flows, mostly foreign direct and portfolio investment, resulting in a balance of payments surplus in the first half of 2021-22.

Budget announcements

The budget speech notes that "*Our experience suggests that reasonable tariffs are conducive to the growth of domestic industry and 'Make in India' without significantly impacting the cost of essential imports.*" It proposes to phase out the concessional rates in capital goods in sectors such as Textile, Power, Petroleum, Leather, Food packaging to name a few, and project imports gradually, and apply a moderate tariff of 7.5 per cent. The budget suggests a comprehensive review that will allow removal of exemption on items which are or can be manufactured in India and providing concessional duties on raw material used for manufacturing of intermediate products.

At least 11 eight-digit HS codes – Edible oils, Umbrellas (MSME sector), Gems and Jewellery, Electrical and electronic items, Solar cells and modules – have seen immediate increase in basic customs duty. In an exercise for simplification of the customs tariff structure for around 1000 eight-digit HS codes, concessional notifications/exemptions have been removed and tariff rates have been reduced from 1st May 2022 such that the effective basic customs duty rate (and applicable cesses) would remain unchanged.

Tariff rates have been reduced with immediate effect for around 150 eight-digit HS codes, primarily fabric inputs and textile products, couple of organic chemicals, and three agriculture/marine products. A phased manufacturing program (PMP) has been proposed with respect to certain electronic goods such as smart watches, hearable devices, smart meters. This, it is claimed will enable domestic manufacturing of high growth items. To facilitate export of jewellery through e-commerce, a simplified regulatory framework is planned to be implemented by June this year. To disincentivise import of undervalued imitation jewellery, the customs duty on imitation jewellery is being prescribed in a manner that a duty of at least Rs 400 per Kg is paid on its import. In the hope that domestic value addition increases, customs duty for certain chemicals where we lack capacity is being reduced while it is being raised for chemicals where we have adequate capacity. Some temporary relief has been given to the steel sector, for example, customs duty exemption on scrap steel, anti-dumping duties and countervailing duties are being revoked. To improve exports of handicrafts, textiles and leather garments, leather footwear and other goods, exemptions have been provided on few of its inputs. For marine products, the tenth largest exporter for 2021-22, duty is being reduced for certain inputs required for shrimp aquaculture.

Assessment

Sectors that comprise India's top ten exports require capital equipment that is not necessarily manufactured in the country. A mapping of our capabilities in the capital goods sector should have formed the basis of this decision to phase out the concessional rates in capital goods. As I had noted in my review of the external sector last year, our capital equipment manufacturing capability is first generation while most of the manufacturing world now uses fifth generation machines. Policy should have focussed on raising local capability in the capital goods sector. The effect of the phasing out of the exemptions for capital goods imports on the competitiveness of the top ten exporting sectors is an open question.

Imports of electronic item and computer hardware as per the ES continue unabated. In this context, implementation of PMP for few high growth electronic items is an indication of not learning from recent experience. For example, PMP in mobile phones only encouraged assembly from semi-knocked down to completely knocked down kits, without much value addition. Trade policy, at the maximum, can act as a complement to industrial policy but not as a substitute.

The budget suggests a comprehensive review that will allow removal of exemption on items which are or can be manufactured in India and provide concessional duties on raw material used for manufacturing of intermediate products. This is welcome provided the review is institutionalized, and reflects the ground realities and results in a database or understanding that can be periodically added on to.

The delay in the notification of rates for the RoDTEP is a clear example of the kind of support given by the government to exporters. The delay may have impacted the order book of many exporters in extremely competitive and job generating sectors like textiles. This may also explain the lack of diversification in terms of product and destination. Straightforward, transparent, and responsive institutions are needed if India expects these sectors to come up in the list of top exporters.

Union Budget 2022-23:
Issues related to technology and innovation

Sunil Mani

The union budget 2022-23 is unique because it deals with several issues related to technology and innovation. This is very timely as technology issues play a much more critical and proximate role in the conduct of economic activities in the country. One could see this in all three sectors of the economy, primary, secondary and tertiary sectors. The technology issues covered in the budget falls into three broad areas: (i) first putting in place institutions and policies for hastening the diffusion of new technologies both in services and manufacturing sectors; (ii) incentivising the generation of new technologies; and (iii) further improving the ecosystem for new technology-based start-ups to emerge and flourish. What is most interesting is that these issues are prefaced with proposals for a significant infusion of capital investments in the infrastructure arena, which through its multiplier effects is expected to increase the aggregate demand in the economy, which will, in turn, exacerbate the demand for the technological innovations that are sought to be impacted by the budget proposals. In other words, the current budget, more than any previous budget, have made a vital endeavour to jump-start and increase aggregate demand in the economy, the lack of which has been pulling the economy towards recessionary conditions. We undertake a critical survey of these policy initiatives embedded in the budget.

1. Creating the conditions for an efficient Sectoral System of Innovation to emerge- by creating demand through large infrastructure projects having high multiplier effects

It has been shown that a sufficient condition for new technologies to diffuse is an increase in the demand for such technologies. Given the continuous decline in the growth rate of the nation's GDP, exacerbated by the ongoing pandemic, there has been a steep fall in demand in general in the economy. Economists of different persuasions have urged the government to jump-start flagging demand in the economy by increasing public expenditure, especially in infrastructure projects with high multiplier effects. The current union budget has addressed this issue admirably well, as capital expenditure has increased by 24.5 per cent in 2022-23. See Table 1

Table 1: Trends in capital expenditure

	In Rupees thousand crore					Percentage of GDP		Growth Rate	
	2019-20	2020-21	2021-22 BE	2021-22 RE	2022-23 BE	2021-22 RE	2022-23 BE	2021-22 RE	2022-23 BE
Capital Expenditure	**336**	**426**	**554**	**603**	**750**	**2.6**	**2.9**	**41.4**	**24.5**
Capital Outlay	311	316	514	547	610	2.4	2.4	73.3	11.5
Loans&Advances	24	110	40	55	140	0.2	0.5	-50	153.5

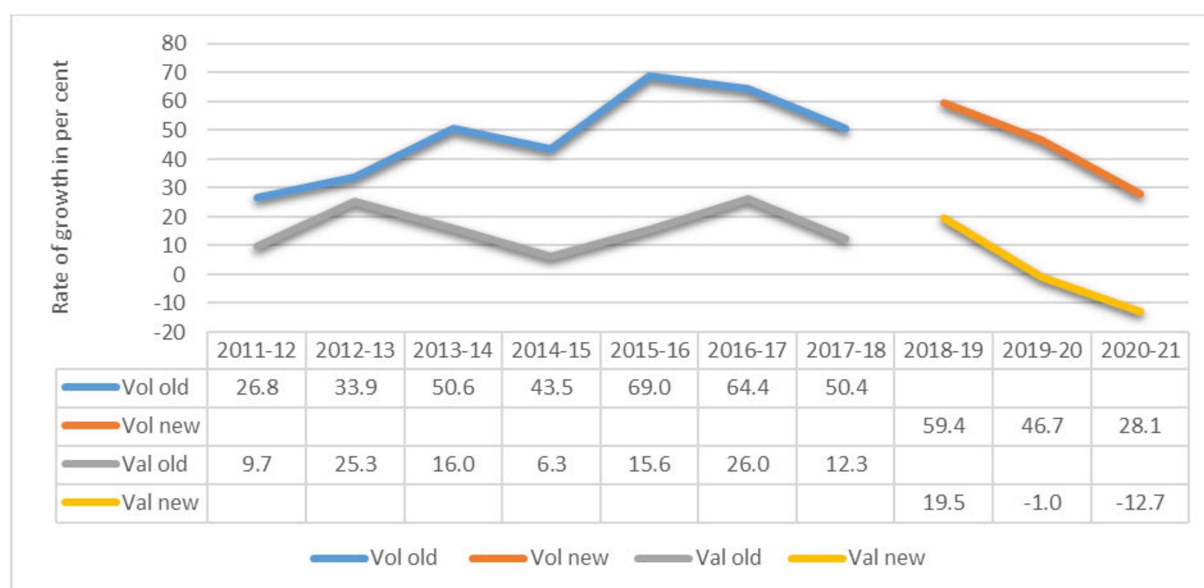
Source: Union Budgets

An important aspect of capital expenditure has been the earmarking of Rs 1 lakh crore to provide interest-free loans to the states for carrying out such infrastructure projects as PM *Gati Shakti* the *PM Gram Sadak Yojana*. Such a large-scale investment is sure to raise demand if and when implemented, resulting in the uptake of several new technologies sought to be diffused by the government. One oft-repeated problem with large public sector projects is that they suffer from severe time and cost overruns. To overcome this problem, the government has enlisted the services of the Capacity Building Commission for upgrading the skills of those involved in such prominent public sector projects. This will undoubtedly minimise the implementation challenges of such large infrastructure projects in a time-bound manner.

2. Incentives for the diffusion of new technologies

2.1 Digital payments

This is one new technology that the government has focused on since 2010. Through its central bank, India has put in place an elaborate set of institutions and technologies for diffusing digital payments in the country since 2010. The Reserve Bank of India has designated the 2010-2020 period as the digital payments decade. Through the union budgets, the union government has been incentivising digital transactions. Further, two temporary shocks, namely the demonetisation episode of 2016-17 and the pandemic since March 2020, are also expected to have spurred digital payments. But digital payments have not diffused in the economy during this period (Figure 1), and this could explain the move toward digital payments using the sectoral system of innovation framework (Mani and Chidambaran, 2022). The subsequent analysis shows that the growth rate of digital payments has declined during the decade even though two of the three building blocks of the sectoral system have been strengthened. But public policies from both the monetary and fiscal authorities do not appear to have affected the third building block, namely the demand for digital transactions. The union budget for 2021-22 set Rs 1500 crores for incentivising digital payments. But this amount was not expended during the current fiscal year as stated in the document, *Implementation of Budget Announcements 2021-22*. The current budget has merely repeated that the amounts set apart for this activity and not spent in the current fiscal year (2021-22) will be spent in the forthcoming fiscal year. But as argued earlier, the primary impetus for driving digital payments (in value terms) is the growth in demand. The incentives covered in the budget will only increase the supply of digital payments.



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Vol old	26.8	33.9	50.6	43.5	69.0	64.4	50.4			
Vol new								59.4	46.7	28.1
Val old	9.7	25.3	16.0	6.3	15.6	26.0	12.3			
Val new								19.5	-1.0	-12.7

Figure 1: Rate of growth of digital payments in India, 2011-12 through 2020-21

Source: Mani and Iyer (2022)

2.2 Digital Currency- Digital Rupee, using *blockchain* and other technologies, to be issued by the Reserve Bank of India starting 2022-23. The introduction of a Central Bank Digital Currency (CBDC) is to be seen in the context of two significant developments. First, cryptocurrencies have been diffusing very fast in India, although empirical data on this is hard to come by. The government has realised that it needs to provide an alternative lest the future of money pass them by. Second, almost 89 countries are

toying with this idea, although only nine countries have introduced a CBDC (Atlantic Council, 2022). But none of the larger countries except China has introduced CBDC even on a pilot basis. One could, of course, see several advantages with a CBDC. For instance, it can lead to more granular control over the economy. Under the fractional reserve banking system, all countries use currently, central bankers can only interact with the economy indirectly, such as by changing interest rates. If the monetary supply existed entirely in CBDC form, with all transactions recorded on one central ledger, central bankers could exert more control over financial flows. Second, it is meant to be easier than mobile apps and has the potential to make transactions easier for merchants by eliminating the need for third-party transaction settlements. But there are several significant challenges as well. These are; first, citizens could pull too much money out of banks at once and purchase CBDCs, triggering a run on banks. Our commercial banking system is already sagging under many Non-Performing Assets, which can lead to further destabilisation of the commercial banking system. Second, centralising, through the government, a system designed to be private may produce a backlash from users and create cyber security risks. But there are several challenges as well. Third, the regulatory processes are not updated to deal with the new forms of money and need to be more robust before adopting this technology. This is in contrast to the introduction of digital payments in the country in 2010. Before that, a comprehensive piece of regulatory mechanism to govern digital payments was introduced in the name of the *Payment and Settlement Act of 2007*.

2.3. Virtual Digital assets

One of the distinct aspects of the budget is that it has, for the first time, introduced provisions for tracking and taxing what is referred to as Virtual Digital Assets (VDA). The Finance Bill has defined a VDA as 'any information or code or number or token generated through cryptographic means. And which can be transferred, stored or traded electronically. Examples of VDA are cryptocurrencies like bitcoins and Non Fungible Tokens (NFT). However, commentators have pointed out that the definition of a VDA is left ambiguous in the specific clause (namely clause (47A) under Section 2 of the Income Tax Act, 1961). According to the budget, any income from the transfer of any virtual digital asset shall be taxed at 30 per cent. Further, to track such transactions, it is also proposed to provide for TDS on payment made about the transfer of virtual digital assets at the rate of 1 per cent of such consideration above a monetary threshold. To put it in perspective, in mid-2019, a Government of India- appointed panel recommended banning all private cryptocurrencies, with a jail term of up to 10 years and heavy fines for anyone dealing in digital currencies. However, the panel asked the government to consider launching an official government-backed digital currency in India to function like banknotes through the RBI. As opposed to the panel's recommendation, the government decided to legalise transactions in VDAs but has also agreed to issue a CBDC through the RBI. This government attitude may be understood in India being a significant player in the market for cryptocurrencies. For instance, according to the *2021 Global Crypto Adoption Index* (Chainalysis, 2021), India is ranked number two in the Global Crypto Adoption Index. See Figure 2. Unofficial estimates put the number of crypto investors in India around 20 million. Given the high adoption of crypto assets among many citizens, the budget proposal for tracking and taxing them makes eminent sense. However, the Finance Minister has subsequently clarified that the imposition of a tax on VDAs is not to be interpreted as the government declaring them legal. It has only made the gains from it taxable.

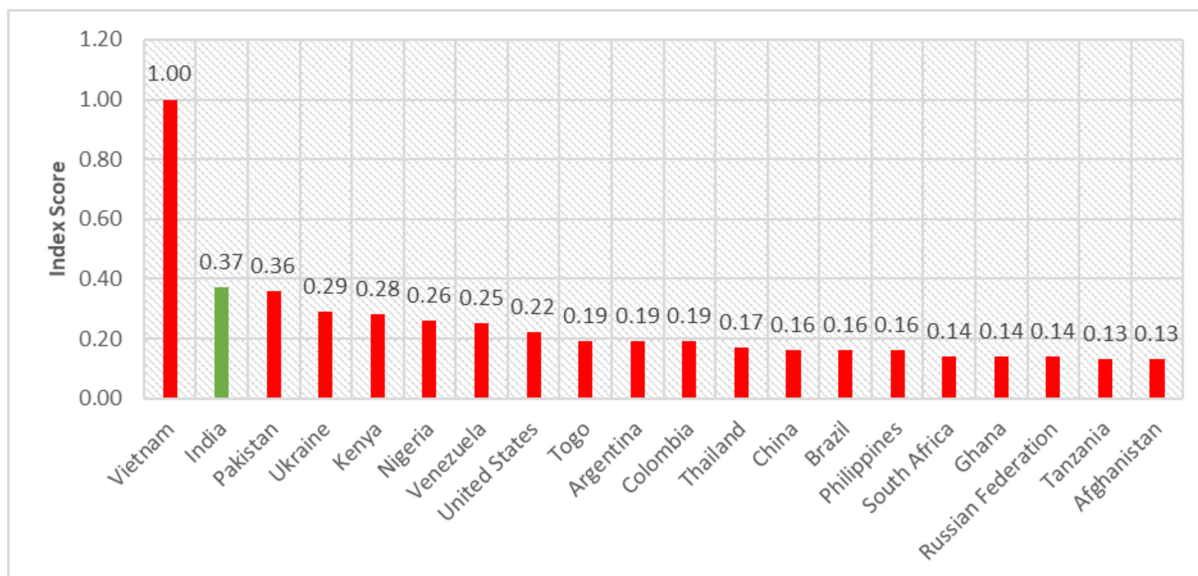


Figure 2: Global Crypto Adoption Index Score across countries, 2021
Source: Chainalysis (2021)

2.4 **Electric Vehicles**

In one of the earlier union budgets (2019-20) GST rate on electric vehicles was lowered from 12 per cent to 5 per cent, and an additional Income Tax deduction of Rs 1.5 lakh on the interest paid on loans taken to purchase EVs. This amounts to about Rs 2.5 lakhs during the entire loan period. But according to the *Society of Manufacturers of Electric Vehicles* (SMEV), the EV industry is at a nascent stage in India. It is less than 1percent of the total private vehicle sales *however has the potential to grow to more than 5percent in a few years.* India has only about 5 lakh electric two-wheelers and a few thousand electric cars[3]. One of the constraints to the faster diffusion of EVs is the lack of availability of charging stations. To overcome this, the current budget has suggested a battery swapping policy with formalised interoperability standards. The swapping policy will allow riders to exchange a fully exhausted battery with a fully charged one for a fee. Theoretically, this sounds like a better alternative to charging stations, especially in urban areas where the space to set up frequent charging stations may be lacking.

2.5 **Solar power**

Another crucial green technology diffusion that needs to be hastened much faster than now is the spread of solar power. The government aims to have an installed solar capacity of 280 GW by 2030. But as of March 31, 2021, the total installed capacity of solar power is only 37.46 GW[4]. Towards achieving this ambitious target, the budget has allocated an additional Rs 19500 crores for Production Linked Incentives to manufacture high efficacy modules. Preference is given to vertically integrated manufacturing units with the capability from polysilicon to solar PV modules.

3. Incentives for the generation of new technologies

3.1 Semi high-speed train technology- case of Train-18

Train 18 is India's first self-propelled train designed and manufactured in India for long-distance inter-city travel. It is yet another example of frugal engineering pioneered by the public sector Integral Coach

[3] Source: SMEV-https://www.smev.in/ev-sales (accessed on March 21, 2022)

[4] Ministry of Power (2021)

Factory of the Ministry of Railways. The project had run into some roadblocks (Mani and Iyer, 2020), which threatened its very existence and survival. Given that the Ministry of Railways is the leading consumer of these trains, public technology procurement is the best and most effective way of incentivising its production. This is precisely what the current budget has done. It has envisaged a public technology procurement of 400 Train 18 sets for the next three years. This certainly is the right way of incentivising the production of this indigenous technology.

3.2 Absence of any incentives for a vaccine for COVID-19

Given the public good characteristics of new technologies, especially those contributing to improved health, there is a strong case for state support for R&D and for converting those research results to commercialise products and processes. The state's support to the market is even more vital in developing vaccines for the pandemic COVID-19, which has engulfed the whole world and has shattered countries' economies and lives and ordinary citizens. There is a strong case for state support to the market in developing crucial technologies and making them affordable so that a large section of society can afford them. This is because new technologies also have natural monopoly characteristics as well. Furthermore, it underlines the importance of invoking industrial policy instruments to support R&D and manufacturing activities by the market. Vaccine for COVID-19 falls into this category of R&D projects which can only be sustained through state support. The cumulative production of the COVID-19 vaccine in India until the end of January 2022 is about 1808 million doses[5], of which only 14 per cent is manufactured with domestically developed technologies. This heavy reliance on foreign technology sources is to seen in the context of India having allocated insignificant amounts of financial support to vaccine manufacturers (Mani, 2021). It was hoped that the current budget would remedy this situation. But alas, the budget is totally silent on any form of financial support to domestic vaccine manufacturers and has not given any indication as to how the Rs 35000 crores that were set apart for vaccine development in the union budget for 2020-21 was spent.

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