DETAILED ANALYSIS ON BALANCE OF PAYMENTS ON CURRENT ACCOUNT

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Abstract: In most cases, an examination of the data comes first, followed by an interpretation of it. The objective of an analysis is to construct some kind of an intellectual model, in which the relevant links have been meticulously established in order to allow for the derivation of certain conclusions that are both reasonable and significant. It is important that the analysis of the data be carried out in such a manner that it may be meaningfully tied to the objective of the research being conducted. An interpretation is defined as an examination of the generalisations and the implications that follow from them. The meanings of the research, as well as the consequences of it, are made abundantly obvious via interpretation. Both the analysis and the interpretation are incomplete without the other, and the interpretation cannot be given any significance in the absence of an accurate analysis. Therefore, they are very interdependent on one another. In point of fact, one may argue that interpretation is a component of the analysis itself. During the time period under consideration, the current account element of the balance of payments account is analysed in this research paper, with a focus on the trend as well as the compound growth rates. The performance of the current account both before and after the implementation of the New Economic Policy was one of the aims of the research, which aimed to analyse the performance of both. A regression model model, the compound growth rates, the t-test were used in the examination of the performance of the debit card.

Keywords: *"Current account, pre-reform periods, post-reform periods".*

I. Introduction

Current Account

A favourable balance in the current account is shown when a nation's transactions with the rest of the world result in current account receipts that exceed current account expenditures. These transactions take place between the country and the rest of the world. The transactions that pertain to products, services, and income that make up the current account of the balance of payments might be functionally categorised into two broad groups. These categories are the merchandise (visible objects) and the services (Invisible items). The tangible goods that are exported and imported are collectively referred to as merchandise. Goods should be provided on a free on board (fob) basis for both imports and exports, meaning that freight and insurance costs should not be included in the total price. The expenses of such things as freight and insurance should, according to logic, be included in the category of invisibles.

Exports

The definition of "exports" is "the act of selling products or services to a foreign nation or of sending or carrying (goods) overseas, particularly for the purpose of sale or commerce." 1 Prior to the nation's achievement of independence, the pattern of international commerce had a colonial bent. During the time before it gained its independence, India's primary exports consisted of foodstuffs and raw materials to the more industrially developed countries. When India first gained its independence in 1947, its percentage of total global commerce was 2.2 percent. Over the course of the previous 55 years, there was a clear downward trend in its proportion of the total commerce in the globe. In the fiscal year 1952-1953, India's exports accounted for close to 1.3% of the total exports made throughout the globe. During that decade (the

seventies), it accounted for a meagre 0.5 percent of total global commerce. The nations that are part of the Commonwealth received about 54% of all of our exports. At that point in time, the United Kingdom alone had purchased 34% of our total exports. The value of India's exports has been gradually increasing during the decade of the 1980s. The table that follows provides an overview of India's export status prior to the implementation of economic reforms.

II. Literature Review

(Foundation, 2008) According to the study's findings, MapReduce is a software framework that makes it easier to create applications that process enormous volumes of data (multi-terabyte data sets) concurrently on big clusters of common hardware in a reliable and fault-tolerant way. Incoming data sets are often separated into distinct, self-contained pieces before being presented to map tasks. To achieve this, a MapReduce task is employed. The reduction tasks arrange the outputs of the maps in accordance with the framework. The likelihood is high that the input and output data for the job are kept in the same location in the file system. The framework handles duties related to scheduling and monitoring. Retries are made for tasks that fail to complete. The processing and storage nodes are often the same. As a result, the Hadoop Distributed File System and the MapReduce framework both use the same set of nodes to carry out their respective tasks (for more information, see the HDFS Architecture Guide). This design produces a high aggregate bandwidth for the whole cluster since the framework can efficiently plan activities on the nodes where data already resides.

(Abouzeid, 2009) Dean is said to have initially proposed MapReduce in 2004. It is not necessary to fully appreciate the inner workings of the MapReduce framework to understand this article. Simply said, MapReduce is a data processing system that uses three fundamental operations to manage replicated and dispersed data over many nodes in a shared-nothing cluster. The cluster's nodes will first individually do a certain set of Map jobs in parallel, independently of one another. The data is subsequently reorganized and disseminated throughout all of the cluster's nodes. Finally, each node on the specified partition runs a series of Reduce processes concurrently. Then, you may do as many map-repartition-reduce cycles as required. There is no restriction on how many cycles may take place. Instead of being decided during preparation, this information is discovered when the program is really being run. By increasing the number of jobs assigned to faster nodes and reassigning work from failed nodes, this enables MapReduce to make adjustments on the fly to account for sluggish nodes and failing nodes.

(Zaharia, 2009) It is possible that some people may come to the conclusion that MapReduce and Hadoop, which is an open-source version of MapReduce, were initially developed for huge batch activities such as the construction of web indexes. On the other hand, in today's world, a MapReduce cluster may be shared by several users for a wide range of applications. These users carry out batch operations and interactive queries in relation to a shared data collection. The results of data multiplexing may be combined and shared, which can cut down on the costs associated with establishing individual private clusters for each research group. The sharing of a cluster results in the consolidation of data (colocation of disparate data sets). The process of replicating data across many private clusters is one that is both time-consuming and costly. Using it, a corporation may also easily run searches that were not expected across a large number of databases. The MapReduce workload at Facebook, a well-known website that operates a data warehouse on Hadoop, was the key driver for our research and development activities. Every hour, a cluster of computers called Hadoop analyzes the event logs from Facebook's website. These logs are then put to use for a number of

reasons, including the analysis of user patterns to enhance site design, the detection of spam, data mining, and the optimization of advertisements.

(Ngazimbi, 2009) As has been shown, one method for addressing certain categories of distributed problems involves combining the MapReduce programming language with the operation of a cluster of connected computers. At its most fundamental level, the MapReduce algorithm may be simplified down to a process that consists of only two steps. During the Map process, a master node will break an issue down into numerous components. These components will then be allocated to other map jobs after being broken down by the master node. There are many map jobs now working on the issue, and each one has its own individual set of duties and tasks to complete. The outputs from the maps are dealt with by the reduction phase before being sent back to the maps. Only map outputs that have a certain key will be given to a particular reducer, and that reducer will only process outputs that contain that key. The value of the MapReduce framework lies in the fact that the Map and Reduce jobs may be partitioned and distributed over several nodes for concurrent processing. As a direct result of this need, the MapReduce platform was developed to provide distributed sorting. The fact that maps are self-contained suggests that they may be run in parallel with other operations, which enables them to be finished even while other endeavors are still being worked on. This makes it possible to finish maps while other tasks are still being performed. An inexperienced parallel or distributed programmer is able to employ a computer cluster with the help of Apache Hadoop, which is a free Java framework for the MapReduce algorithm.

(Wang & Butt, 2009) Some people believe that the MapReduce programming paradigm is a straightforward illustration of machine-independent parallel computing at massive sizes. It does a better job of improving fault tolerance than it does of concealing architectural details by just offering the most basic of abstractions. MapReduce is an ideal solution for operations that need the finding and processing of massive amounts of data, such as those described above. It has shown very strong I/O capabilities when used with conventional clusters. According to recent breakthroughs in petascale research computing and business computing, MapReduce is a parallel programming paradigm that offers a high-productivity alternative to more classic parallel programming paradigms. This is because MapReduce is able to process massive amounts of data in a very short amount of time. It is not known how the publicly available implementations of MapReduce, such as Hadoop and others, perform in a variety of settings and applications; this is the case despite the fact that MapReduce is gaining more and more popularity. When it comes to this subject, the vast majority of individuals rely on their intuition and a kind of approximative science in order to make it through each day. The majority of system designers will only copy and adjust the configuration of another installation without taking into account the particular requirements of their own applications.

III. Discussion
TABLE: "INDIA'S EXPORTS DURING THE PRE-REFORM AND POST REFORM PERIOD FROM 1980-81 TO 1990-91 TO 1991-1992 TO 2001 TO 2022 TO WHOLE PERIOD 1980-1981 TO 2001-2002"

Model	Period	Year	A	B	t	R2	Absolute growth rate	Compound Growth rate
Linear	Pre-reform	1980-81to 1990-1991	1028.78	2376.41	7.05	0.74	2376	-
	Post-reform	1991-1992 to 2001-2002	20285.57	16975.26	20.77	0.87	16975	-
	Whole period	1980-1981 to 2001-2002	-42830.40	9700.88	11.45	0.76	9700	
Log-linear	Pre- reform	1980-81 to 1990-1991	8.600	0.1506	14.18	0.85	-	16.27
	Post-reform	1991-1992 to 2001-2002	10.671	0.1522	18.00	0.86	-	15.22
	Whole period	1980-1981 to 2001-2002	8.470	0.1800	37.24	0.87	-	19.68

Source: Estimated by the Researcher

The chart that came before this one makes it plainly obvious that the slope co-efficient was 2376.41 before the reform was implemented. The fact that the R^2 score for the export variable was 0.85 implies that the independent variable was responsible for more than 85% of the variances in the data. It was discovered that there was a statistically significant difference between the estimates of "b" and "c." This showed that throughout the course of the previous eleven years prior to the adoption of the structural adjustments, exports had climbed by an average of Rs. Prior to the implementation of liberalisation, the similar growth rate was 16.38 percent. As a direct consequence of the BOP crisis, private investment had been showing signs of gradual improvement prior to the introduction of the New Economic Policy. It was determined that deregulatory action was required in order to release the latent productive capacity of Indian business owners and accelerate the growth rate of the Indian economy. This was done with the goal of increasing exports and reversing the downward trend in private investment. The economies of the East, which were more open to trade and investment, saw spectacular rates of economic development and reductions in levels of poverty. The rise in exports may be attributed to the introduction of new export incentive programmes and the expansion of existing ones that took place after 1990. One such incentive is the provision of replenishment licences to exporters, which are then made available for free exchange on the market. This is just one example. The regulations governing the import of some commodities, in particular raw materials and components used in the production of local products, have been loosened as of right now. Between the years 1985 and 1990, profits from exports were exempt from taxes, and selected export businesses were

granted permission to import capital items without paying duty. In addition to that, the interest rate that is applied to export credit was cut from 12% to 9%.

At both the 1% and the 5% levels of statistical significance, it was discovered that the estimations of the regression coefficient "b" (20.88) were statistically significant. The R2 value showed that the example relapse line was very well matched to the data, and the time period immediately after the adjustment had an inclination coefficient of 16975.26. This was made possible by private investment in international firms and government subsidies that encouraged company owners to manufacture and export more between the years 1991 and 2002. This indicates that exports climbed by an average of Rs.16975.26 crores per year during this time period. It was found to be 0.98 percent, while the growth rate that corresponded to that time period immediately after liberalisation was 15.22 percent.

Large product lots will often result in a slowdown or reduction in the number of shipments. When compared to the previous year, 2000-2001, which saw a gain in exports of primary products of 9.2%, the period of 2001-2002 witnessed a fall of 0.9%. Within this sector, a fall of 2.0 percent was seen in exports of agricultural commodities and other associated products. When compared to the growth of 15.6 percent that took place in the years 2000-2001, a number of the major manufactured goods, including handicrafts (17.2 percent), carpets, textiles (10.0 percent), gems and jewellery (1.1 percent), leather and leather manufacturers (2.0 percent), and carpets, all experienced a decline. Leather and products made of leather were also important parts of the manufacturing industry.

The Organization for Economic Co-operation and Development (OECD) and the nations of Eastern Europe saw a decline in the number of trade complaints lodged against them during the years 2001 and 2002. On the other side, there was an increase in product exports to developing countries in Asia and Africa, as well as to OPEC (the Organization of the Petroleum Exporting Countries) and OPEC. Commodities exported to Africa's non-industrial nations witnessed a strong development of 14.4 percent in 2001-02, which is directly proportional to the growth rate of 25.9 percent that was attained in the year 2000-01.

In addition, there was an increase in the quantity of items sent to Malaysia, Singapore, Thailand, and other Asian nations during the years 2001 and 2002. Exports to Japan and the United States had fallen by 16.7% and 8.8%, respectively, for members of the Organization for Economic Co-operation and Development (OECD). In the year 2001-2002, exports to OECD countries accounted for 49.4% of total exports, while exports to developing nations accounted for 30.7% of total exports.

During the course of the research, the slope coefficient was calculated to equal 9700.88, which was the final result. Throughout the course of the research, it was made abundantly evident what the typical annual growth rate of exports was. It is possible to draw the conclusion that the independent variable was responsible for about 87% of the fluctuations based on the fact that its R2 value was 0.76 for the export variable. According to the conclusions of the study, exports had greatly expanded throughout the course of the research period, as shown by a compound growth rate of 19.68 percent. In terms of India's international competitive edge, the country's performance in terms of its software, business, and commercial services exports was better than its performance in terms of its goods exports.

The medium-term export strategy, which was tied to the 10th plan, made a prediction that India's present 0.56 percent share of world commerce will climb to 1 percent by 2006-2007. This prediction was made in the context of the Indian economy. At the levels of 1% and 5%, it was determined that the regression estimate of "b" (11.56), which was deemed to be statistically significant. The Reserve Bank of India (RBI)

has put in a significant amount of effort to persuade banks to provide export credit in a more efficient way. In addition to this, it has simplified the process of managing accounts, transferring money, investing, and many other financial operations. The government announced a number of trade facilitation measures between the years of 2002 and 2007, with the goal of lowering transaction costs in order to increase exports and turn the country into a manufacturing "hub" for high-quality goods and services. This was done as part of a significant fine-tuning exercise for the Export-Import (Exim) policy that was carried out between 2002 and 2007.

Thanks to a gold card conspiracy to recognise commendable exporters for a good history of easy access to commodity credit based on the best conditions to be worked out by the RBI, adaptability in the release of product commitments (EO) by stretching the degree to include the product of goods and services by a group of organisations, and refixation of the product commitments of the previous commodity credit, India's exports had also increased by approximately 34% in rupee terms. This was made possible by a gold card conspiracy This was a really important accomplishment.

Because of the appreciation of the rupee, it's possible that some exporters, especially those whose goods included a little amount of imported material, are worried about the impact the strengthening of the rupee would have on their profit margins. On the other hand, it looked that exporters were displaying their proficiency in the market. The annual results of the largest software exporters, such as Infosys and Wipro, which had admirably maintained strong growth in sales and profits despite the rise in the rupee, were abundant evidence of this fact. These companies' results showed that they were able to maintain this growth despite the rise in the rupee. It was plainly evident that the Indian exporters had effectively capitalised on the extent of the present productivity increases.

If the country's infrastructure continues to grow to the level of world-class standards, this should become even better. In addition, the exporters had tremendously benefitted from lowering credit rates in order to retain their level of competitiveness, which in turn helped the exporters remain competitive. This tendency had to carry on reinforcing itself as India gradually achieved market access, particularly in the assistance domain, in accordance with the principles of the WTO.

t Test

The following 't' test was carried out in order to determine whether or not the growth figures of exports were distinct in the two sample periods.

$$t = b_1 - b_2 / \sqrt{SE\ (b_1)^2 + SE\ (b_2)^2}$$

b1 represents the slope coefficient prior to reform, and

b2 represents the slope coefficient following reform, ranging from 2376.41 to 16975.362.

$$t = \frac{2387.52 - 16986.373}{\sqrt{(338.117)^2 + (813.52)^2}}$$

t = -16.57

It was determined that there was a considerable disparity between both the growth rates of both the two sub units for exports due to the fact that the computed value was greater than the number that was shown in the table.

The current account deficit (CAD) had a precipitous reduction throughout this time period, going from a peak deficit of -4.7 percent of GDP in 2001-2010 to a deficit of -1.7 percent of GDP in 2011-2020. The decrease in the price of oil made this feasible in significant part, while the performance of other components, such as goods exports, the noirs balance, and currency rates, is well below par.

After reaching its all-time high of USD 122.3 per barrel in the January-March 2010 time period, the price of oil dropped to USD 60.4 per cent by the October-December 2020 time period, and it then reached its all-time low of USD 34.7 per oil in the October-December 2015 time period. Because of an increase in global supply, oil prices have seen a precipitous and unprecedented decrease, which has led to a reduction in the proportion of total imports that are comprised of oil (30.8 per cent in 2013-14 to 21.7 by 2015-16). Because of this, the trade imbalance went from reaching its highest point of 10.5% of GDP in 2012–2013 to reaching its lowest point of 6.2% in 2019–20.

The performance of the income statement was satisfactory, and the annual growth rate of goods imports decreased to an average of -5.8 percent from with a rate of 20.5 percent from 2015-2016 to 2017-18. (2018-19 to 2019-20). Even though exports fell from 18.2 percent (2000-2010 to -1.9 percent) (2011-2020), a more favourable position with a reduced trade imbalance was produced as a result of the higher fall seen in imports in comparison to the decline in exports. This was accomplished. The primary reasons for the decline in exports were the regression of global growth (from 3.4% in 2015 to 3.2% in 2016), the reduction in international commerce (from 2.6% in 2015 to 2.3% in 2018), and the high level of policy uncertainty that is now affecting the United States and Europe (GOI, 2020).

The "invisibles" portion of the current account will contribute 4.3 percent of GDP in 2019-20, which is a significant decrease from its previous level of 6.1 percent in 2016-17. This was because of a decline in both the nett exports of services and the nett transfers. Both nett services exports and nett transfers decreased over this time period, with the former going from USD 76.5 billion in 2014-2015 to USD 69.5 billion in 2019-20 and the latter going from USD 65.7 billion to USD 65 billion. The drop in the value of software services exported (from 71.5 billion to 70 billion USD) combined with a decrease in the value of other exported services between 2016–17 and 2019–20 resulted in a drop in the value of nett exported services. The value of private transfers, which accounted for roughly 98 percent of the total nett transfers, decreased from USD 66.3 billion in 2014-2015 to USD 56.6 billion in 2019-2020.

Figure Net Software Services Exports and Net Private Transfers, 2000-10 to 2011-20, India
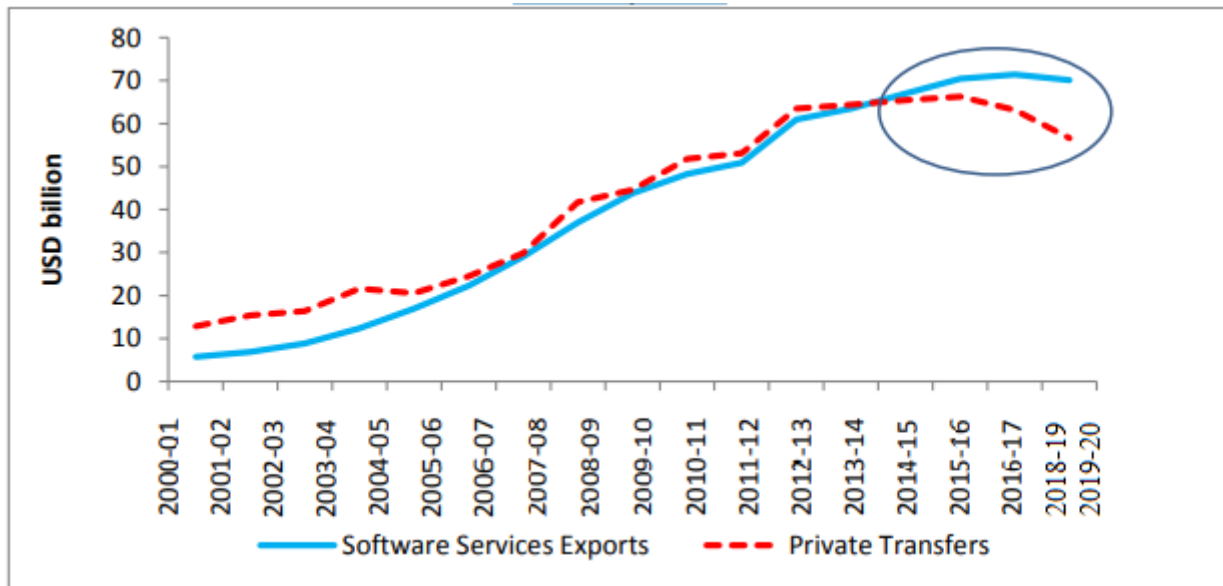
Both the incorporation of severe restrictions for hiring non - resident workers in the United States and a satisfaction and innovation for labourers in Gulf nations, as well as an overall continuing to rise anti-immigration viewpoint in the United States, Europe, and Gulf nations, were major contributors to the decline in nett private transfers. (a) Restricted economy in reference countries probably in Regional countries due to declining oil prices which also have real effect on the business activity, job growth, and income; (b) Total rising pro government sentiments in US, Europe, and Gulf (GOI, 2017). Therefore, bringing down the rate of labour migration out of India by 35% between 2019 and 2020. (World Bank, 2020).

IV. Findings

Before New Economic Policy the trend analysis for exports for the years from 1980-81 to 1990-91 had revealed that there was an increasing trend. The average annual growth rate of exports during pre liberalization period was 2376.41. The compound growth rate was 16.27.

After new economic policy for the years from 1991-92 to 2001-02, it shows continuous growth rate. It increased more than five times during the study period. From the year 1991-92 to 2001-02 the average annual growth rate of export was 16975.26. The calculated compound growth rate of export was 15.22. The Indian exporters were to trade with the international trading community and there was a significant influence of the increasing exports on overall economic activity of the country during the years.

During 1980-81 to 2001-02 the average annual growth rate of export was 9700.88. Regression co-efficient was significant at both levels. 99 percentage variation found in exports had been explained. It shows sizeable growth rate due to adoption of New Economic Policy. The compound growth rate was 19.68. Chow's 'F' test which was carried out to study the structural changes that occurred in the trends of exports between the pre-reform period and the post-reform period, led to the conclusion that the increase in the compounded growth rate during the post reform period compared to that of the prereform period was statistically significant. Thus, there was a structural difference in the growth rates between the pre-reform period and post-reform period.

The 't' test, which was carried out to examine whether the growth rates for exports differed between the two sub-periods, had shown that there was a significant difference between the two periods for exports.

Despite the fact that the most recent period (2001-2010 to 2011-20) saw a significant decrease in the current account deficit owing to falling oil prices, the global headwinds imply that challenging times are ahead for India's external sector. There is a growing concern that India's services exports and remittances would suffer as a result of the rise in nationalist impulses, as well as the growing anti-globalization and anti-migration attitudes. The statistics indicated that there was a decrease in remittances as a result of decreased economic activity in the Gulf area (due to the fact that it is strongly associated with oil prices and exports) and higher return migration (stricter immigration rules and local hiring requirements). In the midst of technological upheavals and upgrades as well as growing trade barriers, particularly with the United States, the performance of software services, which are still another major component of the current account, was lacklustre throughout the time in question.

The objective of external stabilisation was met in large part, with the exception of the years 1990–1991 and 2000–2011, during which the current account deficit (CAD) as a percentage of GDP reached levels that were unsustainable. This made India's external sector vulnerable to shocks in foreign capital flows and volatility in foreign interest rates. Therefore, it is essential to emphasise the need of preserving and limiting CAD to levels of GDP that are sustainable in order to guarantee external stability. In addition to outlining and documenting the most significant historical events in India's current account, this chapter also compares the CAB of major countries from the years 2000 to 2020. After the global financial crisis of 2008-2009, most of the chosen nations, including India, went through transitions. The worldwide recession that began in 2009 has varying effects on the world's main economies. While China saw a decline in surpluses as a result of falling global trade and an appreciation of the yuan versus the dollar, Germany continued to see expanding surpluses in its current account. This occurred as a result of the increasing trade surpluses with peripheral states like as Greece, Portugal, and Spain. Between the years 2000 and 2010, Greece was hit with the severe economic crisis and an enormous and unsustainable CAD. Greece was able to get out of its BOP scenario because to the injection of funding by the European Central Bank and harsh austerity measures. On the other hand, Brazil's economy remains a somewhat closed one, and except from the tiny surplus that was seen during the years 2000-2010, it has faced a prolonged deficit in its current account, which has marginally improved over the years 2019 and 2020. The current account deficit for the United States has decreased since 2019, which may be attributed in part to increasing fiscal restraint and an increase in savings relative to investments.

V. Conclusion

India's balance of payments has been stabilised and is on a sustainable path thanks to the liberalisation of the country's external sector during the previous decade, which began in response to the crisis of that year. The changes made the Indian economy more accessible to foreign trade and investment, particularly from other rising nations. Nonetheless, there is still a lot of work to be done. Even when compared to its 'peer rivals,' India's economy is still rather closed. Additional reform of domestic policies, as well as the elimination of tariff protection and liberalisation of capital flows, would encourage investment and growth in the Indian economy. The most important takeaway from the 1990s was that a more liberalised current and capital account makes the balance of payments more adaptable and stable. The same holds true for the foreign currency market, non-visibles, equity capital, MLT debt flows, and commerce. This thesis affirms

that the currency rate is a potent mechanism of adjustment in India's current account deficit. It also confirms that capital flight is not expected to be a significant contributor to BOP issues. As a result of changes in the external sector, the effect of fiscal profligacy on the balance of payments is now diffuse and complicated. As a result, it functions primarily via the risk premium required by international (and local) investors and lenders in light of prevailing views of economic prospects. As a result, it will probably have more of an impact on the current account at home than on the trade balance. That is to say, the growth rate of the economy and the domestic financial sector will be more likely to feel the long-term impacts of fiscal profligacy in the future.

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