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**Towards A Revisions Policy for India's
Balance of Payments Statistics**

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TOWARDS A REVISIONS POLICY FOR INDIA'S BALANCE OF PAYMENTS STATISTICS

Executive Summary

- Revisions policies, practices and studies form a key element of the Fund's Data Quality Assessment Framework (DQAF).
- Country practices reveal a wide diversity surrounding the key elements: regular, well-established and transparent schedule of revisions; clear identification of preliminary data; and public availability of revisions studies.
- A key driver of the formulation of revisions policy is user needs.
- Revisions policies for BoP statistics face a dilemma – incorporating more accurate/complete information versus preserving data stability
- Extraordinary revisions overriding the established revisions cycle are common, driven by detection of errors, significant revisions and methodological change.
- Historical revisions are difficult to identify and are typically associated with countries which have stabilised their revision cycles.
- In India, several elements of a stable and consistent revisions policy were already in place: consultations with key users; strong similarity with the country experience; timeliness in preliminary data releases; clear identification of preliminary and revised data; systematic dissemination of revised data.
- The lag structure of data reported for BoP compilation in India shows that the provisional data are received within a time period ranging from 7 to 80 days from the reference date. The maximum period up to which revisions occur is 14 months. The maximum lag of 24 months is reported for reinvested earnings of FDI enterprises.
- The Mean Absolute Percentage Error (MAPE) for India's gross current receipts and payments is low, attesting to co-movement between revised and preliminary data. Both the MAPE and the MARE attest to the stability and reliability of the revised CAB. For CAB, the RMSRE and MRE coincide.
- The two measures for errors and omissions *i.e.*, average absolute error (AAE) and root mean square error (RMSE), indicate a high level of internal consistency in India's BoP data.
- Quantitative indicators of data quality need to be back-tested more rigorously. They can only reinforce qualitative assessment of the data, not substitute for it.
- A clear understanding of the lag structures, institution of an electronic reporting system for banking data (FET-ERS) and benchmarking national requirements against the cross-country experience were key factors leading to announcement of a revisions policy for India's balance of payments data.

TOWARDS A REVISIONS POLICY FOR INDIA'S BALANCE OF PAYMENTS STATISTICS

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I. Introduction

This paper is intended to be a tribute to the seminal work undertaken in the IMF to coagulate good practices in revisions of macro economic statistics and encourage their wider adoption among national statistical authorities. Revisions policies, practices and studies form a key element of the cascading structure of the Fund's Data Quality Assessment Framework (DQAF). More crucially, they form aspects of good governance (Carson, Khawaja and Morrison, 2003). This, and other surveys of country practices (IMF, 2002) reveal a wide diversity surrounding the key elements of a good revisions policy contained in the DQAF: (i) regular, well-established and transparent schedule of revisions; (ii) clear identification of preliminary data; and (iii) public availability of revisions studies.

With the foregoing as its *leit motif*, this paper elucidates how processes of governance in balance of payments (BoP) statistics in India reached critical mass, leading to the announcement of a revisions policy on September 30, 2004 for the first time in India (www.rbi.org.in). The next section presents the main findings of a cross-country survey on revisions policy undertaken to learn and adapt. Section III sets out the specific features of the data reporting system in India – timeliness, accuracy, length of revision cycles, public awareness. Section IV attempts some quantitative assessment of the results of recent revisions as a prototype of a revisions study. In conclusion, the paper sets out the revisions policy for India's BoP statistics which essentially forms out of this accumulated analysis.

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II. A Summary of the Country Experience

As Carson *et al* underscore, a key driver of the formulation of revisions policy is user needs. Users – policy authorities, investors and financial market participants/analysts, international organisations, researchers and the media – ask the following questions

- How accurate are first releases?
- What is the likelihood of further revision, which way and by how much?
- What are the causes of revision?
- Is there a well-defined policy?

For most national authorities, the undertaking of revisions has two hovering spectres - additional work and the discovery of mistakes in a world rapidly shifting under their feet and necessitating generation of new data as well as conceptual and methodological revisions. These fears emerge from the country studies as the major impediments to publicly announcing revisions policies. Formally announced updating of weights/base year, bringing in authentic/new data that is well known, statistical refinement (seasonality, detrending, etc.,) changes in concepts/definitions/presentations recommended by supra-national standard setting bodies constitute the virtuous segment of the revisions policy motivation cycle. Here, resource constraints are clearly an overall constraining factor.

Countries which have announced revisions policies for BoP statistics have typically grappled with the horns of a dilemma – the desire to incorporate more accurate/complete information into official data series versus the practical necessity of preserving the stability of the data series since users interchange stability with accuracy (Australian Bureau of Statistics 2002; Central Bank of Chile, 2003, Statistics New Zealand, 2002). Accordingly, partial revisions to data for the current year are carried out during the year with every monthly/quarterly release (Australia, Chile, Estonia, Italy, Norway, New Zealand).

Final revisions are generally undertaken with long intervals, the earliest being semi-annually (Australia), at the last quarterly release for the financial year (New Zealand, Ukraine) and twelve-monthly (Chile). A common experience emerging out of

the country experience is that revisions are a process, not an event. The underlying drivers are arrival of late returns (New Zealand, Estonia, South Africa) different frequencies and lags for sources (Chile, Korea), integration with national accounts (Chile, Australia, Norway), replacing estimates with actual data (Chile, USA), correction of errors (New Zealand, Chile) and new data sources/improvement in reporting or estimation procedures/concepts (Chile, Italy, South Africa, Ukraine). Accordingly, only a third of SDDS countries are reported to complete revisions in one year largely with the hope that as time passes, the significance of revisions diminishes. Twenty per cent of SDDS countries revise up to two years and 15 per cent up to three to five years (IMF, 2002).

Extraordinary revisions overriding the established revisions cycle are fairly common in the country experience. The underlying causes range from the candid detection of errors (New Zealand) to ‘significant revisions’ (Australia) and methodological change (Chile, Estonia, Italy, Norway, Ukraine). More often than not, the reasons for extraordinary revision are not clearly discernible.

In most countries, studies of revisions are either not conducted or are not made public (IMF, 2002). Evidently, the desire to abstain from confusing users in the face of scanty public interest in such analyses is a major inhibiting factor. In a few countries, revisions studies are made available when major methodological changes occur or when there is a ‘structural break’ due to new data collection methods (Italy). Some revision analyses include cross-country comparisons (New Zealand). In one instance, revision studies seemed to follow a regular pattern (Australia). In the majority of countries examined, revisions are notified in the public release; in some cases, causes of revision are explained in footnotes or accompanying text.

Information on the occurrence of historical revisions is difficult to identify in country reports. Such revision exercises are typically associated with countries which have stabilised their revision cycles (South Africa, Australia, New Zealand).

A summary of these findings from a sample of 23 developed and emerging market economies is set out below (Table 1).

Table 1: Cross Country Comparison of BoP Revision Practices

Country	Pre-determined Revision Cycle	Lag in Release of Final Data	Escape Clauses (Extraordinary Revisions) (Reasons)
Argentina	Yes	6 months	..
Australia	Yes	4 years	Significant revisions that are important enough to require immediate publication
Brazil	Yes	6 months	..
Canada	Yes	4 years	Historical revisions
Chile	Yes	15 months	..
Germany	Yes	4 years	..
Hong Kong SAR, China	Yes	2 years	..
Indonesia	Yes	6 months	..
Israel	Yes	Updated each year	..
Italy	Yes	13 months	Methodological changes/new collection system
Japan	Yes	4 months	..
Korea	Yes	6-7 months	Conceptual and methodological
Malaysia	Yes	12 months	..
Mexico	Yes	5 months	..
New Zealand	Yes	18 months	Significant revisions balancing the need for stability in the series and integrity of the statistics
Philippines	Yes
South Africa	Yes	4 years	Changes in historical data in the light of new information
Sweden	Yes	Updated each year	..
Thailand	Yes	Updated each year	..
Turkey	Yes	Final at the time of dissemination of annual provisional data	Measurement issues
UK	Yes	12 months	..
US	Yes	6 years	Major conceptual and methodological revisions

.. Not available.

Source: IMF (2002), Revision Policy and Practice: A First Overview of Country Practices.

At the other end of the spectrum are countries with no established revision policies, inspite of considerable sensitivity to the need for such policies. Until September 2004, India belonged in this category. In the Euro area, lack of harmonisation across members and different reporting requirements to data authorities are the key impediments to a unified and publicly announced revisions policy. In Japan, the overarching desire to ensure continuity of data series and thereby their credibility has considerably dampened the need for a revisions policy even as recognition that it is an international best practice has grown.

III. A Revisions Policy for India's BoP

In India, the laying down of stable policies and practices for revisions in BoP data has been an abiding concern. This has found expression in a mammoth revision exercise covering data for the period 1950-81, primarily to incorporate reinvested earnings of FDI enterprises and non-cash inflows of FDI Reserve Bank of India, (RBI, 1993). Although revisions were not systematically conducted for subsequent years, an indigenous manual on balance of payments compilation procedures was developed to provide an anchor for latter day compilers to good practices of the past (RBI, 1987). A paper presented by the RBI at the fifteenth meeting of the IMF's BoP Committee in 2002 showed that several elements of a stable and consistent revisions policy were already in place:

- consultations on revision practices with key users
- strong similarity with the country experience on during the year revisions
- timeliness in preliminary data releases
- clear identification of preliminary and revised data with explanatory footnotes to Tables
- dissemination of revised data (RBI, 2003)

The principal factor that needs to be reckoned in the setting of a revisions policy for BoP in India is the varying lags in arrival of data from source entities. The lag structure of data reported for BoP compilation shows that the provisional data are received within a time period ranging from 7 to 80 days from the reference date (Table 2). Partial revisions for different items of BoP occur at discrete intervals of varying

periods, depending on the source of information. The maximum period up to which revisions occur is 14 months for data reported by banks for receipts and payments against merchandise exports/ imports, invisible and financial transactions. The maximum lag of 24 months is reported for reinvested earnings of FDI enterprises which are obtained from the IIP. In summary, the lag in arrival of final data from different sources varies from 2 months to 24 months.

Table 2: Lags in Receipt of Data for BoP Compilation in India

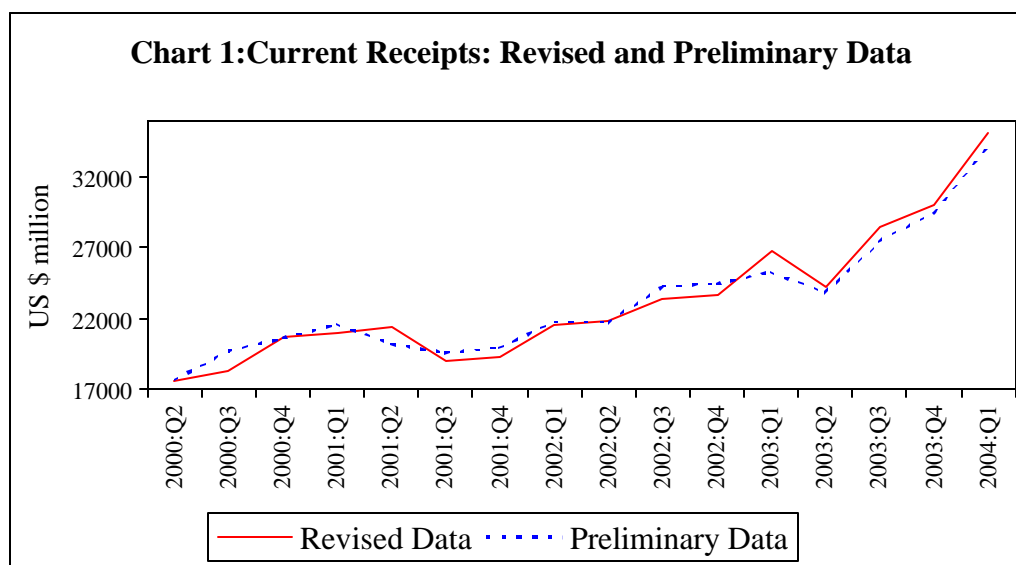
Items	Lag in Reporting of Data (measured from reference date) (No. of days/months approximately)		
	Provisional (First Release)	Partial Revisions	Final Revision
Merchandise Trade, Customs	30 days	3 revisions covering 10 months	10 months
Banks' Reporting of Receipts and Payments of Merchandise, Invisible and Financial Transactions	30 days	Monthly revisions covering 14 months	15 months
Tabulations for Preliminary data release	80 days		Occasional
Baggage Bullion, Customs Imports and Grants routed through Embassies/Consulates	30 days		2 months
Official Grants	30 days		2 months
Aid Receipts	60-75 days		12 months
Software Exports	60-75 days	3 revisions in 12 months	12 months
Foreign Direct Investment			
Equity	60 days		12 months
Reinvested Earnings	Estimates		24 months
Other Capital	80 days		12 months
Portfolio Investment in Stock Exchanges	15 days		Occasional
Bond/Equity Issues in International Stock Exchanges	30 days		Occasional
External Commercial Borrowings	60-75 days	3 revisions in 12 months	12 months
Short-term Trade Credits	30 days		3 months
Non-Resident Deposits	60 days		3 months
Foreign Assets and Liability of Banks	20 days		3 months
Other Components of Banking Capital	60 days	No revisions	
Other Financial Transactions	60-75 days	Monthly revisions covering 14 months	15 months
Foreign Exchange Reserves	7 days	No revisions	

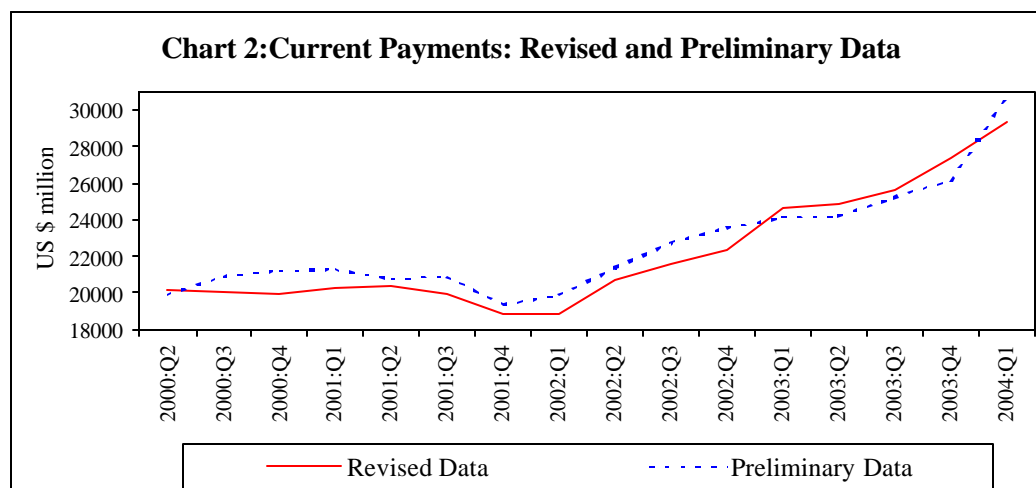
IV. Quantitative Analysis of Revisions

Revisions and reliability go hand in hand. Practical considerations emerging out of the country experience suggest that the former can be sacrificed at the altar of the latter in the short-run. In the longer run, however, there is a co-integrating relationship. Clarity about rules and processes of revisions can only complement reliability, which is a qualitative concept since information on macro economic statistics is a public good.

Reliability is quantitatively defined in the IMF's DQAF as the closeness of the initial estimated value to the subsequent estimated value. This involves the assessment of revisions in terms of size and stability *vis-a-vis* the earlier releases of data. In this regard, key indicators have been developed for the Euro area (Eurostat and European Central Bank, 2003). These indicators are assessed in the Indian context for the period Q2 2000 to Q1 2004 for which revised data on India's BoP were made available along with the announcement of a revisions policy.

The basic assessment of the reliability of revised data is the simple calculation of the differences from the preliminary data. This is set out in Charts 1 and 2 for gross current receipts and payments which, in the case of India's BoP, are subject to the maximum amount of revisions. The graphs reveal close co-movement between preliminary and revised data. For recent quarters, the revisions suggest that the preliminary data had a modest downward bias.

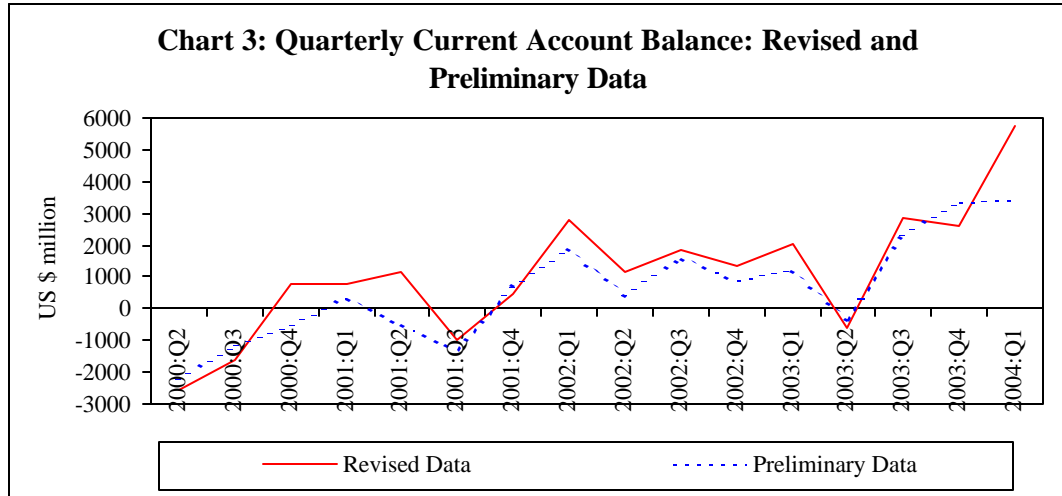




As the Joint ECB/Eurostat Task Force on Quality has pointed out, the evaluation of revisions in terms of magnitudes hampers comparability across time, across different variables and across countries. It is, therefore, necessary to employ a relative measure. The Task Force proposed the Mean Absolute Percentage Error (MAPE) for gross data which is expressed as percentage changes between revised and preliminary data as a ratio of the revised data and averaged over time. Table 3 shows that the MAPE for India's gross current receipts and payments is low, attesting to the co-movement showing up in the graphical representation.

Table 3: Mean Absolute Percentage Error Statistics For Current Receipts and Payments in India BoP	
Variable	MAPE= $1/N \sum (R_i - P_i)/R_i $, R= revised data, P= preliminary data
Gross Current Receipts	0.029
Gross Current Payments	0.036

The current account balance (CAB) reveals a generally close association between revised and preliminary data, except in Q1 2004 when methodological changes in the process of collecting merchandise trade statistics at the customs frontier brought about a significant upward shift and necessitated revisions in the BoP (Chart 3).



For the CAB, the MAPE may not yield meaningful results since the CAB is a net concept and expressed as the difference between exports and imports or foreign exchange relating to these opposing flows of underlying transactions. The quantitative indicator for the CAB as for other net transactions would have to express the difference in magnitudes in relation to the variability of the revised series. Accordingly, as recommended by the Task Force, the Mean Absolute Relative Error (MARE), the Root Mean Square Relative Error (RMSRE) and the Mean Relative Error (MRE) were computed to assess the impact of revisions on India's CAB.

Indicator	Value
MAPE	0.0430
$MARE = 1/N \sum (R_i - P_i)/Var(R) $	0.0002
$RMSRE = \sqrt{1/N \sum (R_i - P_i)^2} / \sqrt{1/N \sum (\bar{R} - R_i)^2}$ where \bar{R} is the average value of R	0.4747
$MRE = [\sum (R - P)^2 / \sum (\bar{R} - R)^2]^{1/2}$	0.4747

Both the MAPE and the MARE attest to the stability and reliability of the revised CAB indicated by the MAPEs for gross current receipts and payments. The RMSRE and the MRE yield somewhat higher values, possibly associated with the choice of reference

value for the revised series (denominator), since revisions are normally expected to minimize deviations from the series average. Moreover, the RMSRE and the MRE coincide, suggesting that the latter is a recommendation of the general case rather than an alternative to the RMSRE.

Given the ambiguity reflected in the values obtained for RMSRE and the MRE, data quality assessment was also undertaken in terms of the analysis of variance which highlights the reasonable degree of stability of revisions. The t-statistics and F-statistics relating to current account balances reveal that the variance of the revised series is not significantly different from the original series (Table 5).

Table 5: Analysis of Variance of Preliminary and Final Data Series on Current Account Balances

Sample period: 2000:Q2 to 2004Q1	
t-Test: Two-Sample Assuming Equal Variances	
t Statistics	0.7360
t Critical two-tail	2.0423
Null Hypothesis: Two series have the same variance	
F-Test Two-Sample for Variances	
F-Statistics	1.5069
F Critical one-tail	2.4034
Null Hypothesis: Two series have the same variance	

Tests were also conducted for internal consistency, based on the errors and omissions series. Revisions are expected to result in cancellation/reduction of estimation errors and consistency in the direction of errors associated with individual items. The two measures for errors and omissions (EO) recommended by the Task Force are computed *i.e.*, average absolute error (AAE) and root mean square error (RMSE), the latter being amenable to further decomposition into bias and variance.

Table 6: Indicators for Errors and Omissions	
AAE = $\sum EO / (N+1)$, where EO refers to errors and omissions as a proportion to gross current receipts (figures in brackets are EO expressed as proportions to gross current receipts and payments)	0.009 (0.00003)
RMSE = $\sqrt{\sum(EO)^2 / (N+1)}$	0.011 (0.00550)

Quantitative indicators of data quality need to be back-tested more rigorously and widely before they can be adopted as standards in revisions studies. Above all, it needs to be underscored that they can only reinforce ‘..... qualitative assessment of the data, not as a substitute for it’ (Eurostat and the European Central Bank, 2003).

V. Conclusion

In India, a clear understanding of the lag structures associated with the key factor – arrival of data – has been enabled by the institution of an electronic reporting system for banking data (FET-ERS), primarily with a view to complying with SDDS requirements for release of preliminary BoP data. Benchmarking national requirements against the cross – country experience reveals reasonably close co-movement. The Revisions Policy for India’s Balance of Payments Data pensively reflects the journey along the learning curve:

“India’s balance of payments statistics are published as ‘preliminary’, ‘partially revised’ and ‘revised’ data. Preliminary data are quarterly and are released with a lag of three months from the reference date (e.g., data for the quarter ending March 2004 are available at the end of June 2004). Preliminary data are subjected to some revisions during the year and partially revised data are released with lags of six months, nine months and twelve months from the reference date, alongside preliminary data for the relevant quarter(s). Thereafter, the data are ‘frozen’ and final revisions are incorporated in the revised annual data, which are released within a lag of twenty-four months from the reference date. Extraordinary revisions may be undertaken within this cycle in the event of methodological changes in respect of data collection and compilation procedures and/or significant changes indicated by data sources that cause structural shifts in the data series. These extraordinary revisions are documented at the time of release. Preliminary, partially revised and revised data are clearly identified in the text and tables”(RBI, 2004).

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