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**CHALLENGES AND PROBLEMS IN  
FORECASTING CARIBBEAN ECONOMICS:  
SOME DATA ISSUES**

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# CENTRAL BANK OF TRINIDAD AND TOBAGO

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## Challenges and Problems in Forecasting Caribbean Economies - Some Data Issues

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*It is all too possible for someone to activate an econometric software package, of which he has only a dim understanding, to apply it to data of whose nature and provenance he is ignorant, and then to draw conclusions about an economic situation, whose historical and institutional realities he has, perhaps, not studied in any depth. The literature must surely contain more than a few nonsense regressions which have survived the editorial process, and have not yet been consigned to the econometric graveyard.*

Johnson (1991)

*I don't care about all that complexity, just give me the number.*

Anon

Forecasting is as old as time and one can trace some of the earliest recorded examples of forecasting to the Oracle at Delphi. Within recent times, macroeconomic forecasting has grown by leaps and bounds especially during the postwar period. The growth of Keynesianism and national income accounting provided a framework within which large scale macromodels could be built and tested. Macromodel building can be traced back to the work of the Cowles Commission and Tinbergen to mention a few examples. Developments in this early period dictated to a large extent the type of models which were built by the different schools - American, British and Dutch for example. Caribbean model building is of much more recent vintage and its early roots can be traced to the work of Nicholas Carter (1970) and others. Since that period, several macro models with forecasting features have been built within the Caribbean. The work of Gafar (1977), Persad (1975) and Holder and Worrell (1985) all come easily to mind. In the Central Bank of Trinidad and Tobago Hilaire, Nicholls and Henry (1990) combined the various existing submodels to produce the Bank's first macromodel of the economy

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of Trinidad and Tobago. Version I of this model was completed in 1990 but no further progress was made towards Version II.

In the fifty years or so since the work of the Cowles Commission was first presented there have been great strides made in economic theory, econometric theory, and even economic computing. Yet to a large extent, the data used in most econometric models have not kept pace with these developments, particularly so for developing countries, but less so for the industrialized economies. And even in the case of the more developed economies, some practitioners believe that there are still not enough data available.

Concerns with data are nothing new as is evidenced by the work of Morgenstern (1963) and Griliches (1986). Issues of reliability, measurement bias and comparability have been raised at several different fora. The latest issue of the *Journal of Development Economics* (1994:3 - 27) is devoted to concerns about the database used for development analysis and spans an area wider than that of economic statistics. In light of the recent decision by the Regional Programme of Monetary Studies (RPMS) to initiate macroeconomic forecasting for the CARICOM region, it is important that we take another look at our economic data.

This note examines some of the data deficiencies which exist in the case of Trinidad and Tobago and by extension the Caribbean. It is our view that data deficiencies pose serious problems for model building and forecasting in the Caribbean. Economic theory (including Caribbean economic theorizing) provides us with the conceptual framework and the particular mathematical formulation we might wish to test; econometric theory gives us the appropriate tools, techniques and the inferential procedures to test the validity of our models. Our statistical data provide the raw material for testing these models but if there are major deficiencies, we run a great risk of making wrong policy conclusions on the basis of our models. In the remainder of this note we

describe five major types of deficiencies to be found in the economic statistics of Trinidad and Tobago (TT);<sup>1</sup> and we provide some suggestions for improvements.

### **Some Major Deficiencies of Economic Statistics in Trinidad and Tobago**

Any discussion of the present statistical database in TT must be considered in terms of the two major actors in the system - the Central Statistical Office (CSO) and the Central Bank of Trinidad and Tobago (CBTT). In the case of the former, the Act of Parliament which established the CSO mandated the organization to '*collect, compile, analyse and publish statistical information . . . commercial, industrial . . . economic . . .*'. In some instances the CSO has delegated its authority to other public officers such as the Ministry of Agriculture or the Ministry of Energy. The Central Bank by its own enabling legislation has a regulatory function in respect of the financial system and also has a legislative mandate to undertake continuous economic research. To this end the CBTT has assembled and maintains on a current basis economic data with a primary focus on monetary, financial, fiscal and real sector variables. At first blush therefore one may argue that the country is well served in the area of economic statistics.

Perhaps ten to twenty years ago, this statement may have indeed been true; however given the changing economic situation and shorter time horizon of our decision makers one can identify six major areas of weakness in our economic statistics. These may be listed as follows - timeliness of current output; the lack of new data series; inadequate periodicity; not enough transformations; short data sets; absence of forward looking indicators. In outlining these deficiencies the focus is deliberately not placed on issues of methodology, measurement bias, economic sectoring (TTSNA versus ISIC), or even whether the data that we use bear any relationship to our theoretical constructs. Each of these topics may be subject to separate research notes and ought not to be

<sup>1</sup> In this paper the discussion is focussed on economic statistics. Other commentators may wish to explore problems which may be associated with data in the social arena.

dismissed very lightly. Indeed, if the RPMS intends to build a macromodel for the CARICOM region then these very issues need to be confronted at the immediate outset.

### *Timeliness of Current Output*

Let us consider the first deficiency - the timeliness of current output. Today, decision makers want access to data as well as forecasts of our data almost instantaneously, so as to inform policy formulation. Thus for example in the current liberalised environment in Trinidad and Tobago, any model which must be used to determine open market operations cannot be hindered by long data lags. In Trinidad and Tobago the timeliness of CSO's output has deteriorated over the past few years. While data on the monetary and financial system are available from the Central Bank with relatively short lags, there are major problems with the real sector data available from CSO.

The CSO's publication of the Index of Retail Prices generally has the shortest time lag (one month); however the situation with external trade data and some production data gives some cause for concern. In these instances the lags can be as long as one quarter. In the case of national income data, annual estimates of GDP by sector of origin are available once a year at budget time. Complete national accounts data seem to be available at five yearly intervals and in many respects some sectoral estimates are weak and are subject to constant revision. This is clearly an unsatisfactory position for a country and by implication any serious policy model builder. The situation has worsened considerably in the last eighteen months or so as is underscored in the following example. In 1989, the CSO approached the Central Bank to '*delegate*' to the Bank responsibility for the balance of payments. At that time, the Bank decided to introduce quarterly balance of payments accounts and report these statistics with a quarter lag. This approach was followed because of several new surveys which were introduced, even though at that time the merchandise trade data tended to be current. Over the past twelve to eighteen

months the situation has worsened and now the entire balance of payments is reported with a quarter lag in the Bank's Quarterly Bulletin.

### *Lack of New Data Series*

A second area of weakness relates to the absence of new data series and one may examine this issue from two dimensions. The first relates to the updating and rebasing of existing data series while the second to the introduction of entirely new series. For a considerable period of time into the 1980's, the CSO's series on real GDP was still measured at 1970's prices, and this very fact provided the impetus for the Central Bank to derive its own real QGDP Index. As a result the Bank introduced a quarterly real GDP series which took an *index number approach*. The very existence of the Bank's index number provided an impetus for the CSO to revise its own series and currently both series have a 1985 base year.<sup>2</sup>

A second example can be found in the area of the Index of Domestic Production. The CSO's current Index of Domestic Production which is a commodity based index, has a base year (1977=100) which is about 18 years old. While it may be relatively easy to splice new commodities in the index (e.g. methanol, natural gas liquids) the economy has changed dramatically over the past 18 years. In this respect, the individual weighting of the overall Index may be inappropriate for 1994; the index cannot take account of the changing nature of the operations of several manufacturing establishments. A similar argument can also be made for the Index of Retail Sales.

But if we ignore the issue of updating and revising, we cannot avoid the problems which arise from the absence of new data series. Forde (1989) identified the following areas in which no data existed for Trinidad and Tobago: concentration ratios, wealth, bankruptcy (personal, corporate), rates of return, capacity utilization, and investment

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<sup>2</sup> At present the Central Bank is in the process of revising the base year of its QGDP Index to 1991, rather than 1990, given the fact that 1990 was not a 'normal' year for Trinidad and Tobago.

intentions just to mention a few. This complaint was made some five years ago and today still no progress has been made in the compilation of even one of these series which are important to decision makers. In 1994 one would wish to add more items to the previous catalogue: house prices, housing starts and satellite accounts for example. Most Central Banks in the region make policy changes which directly or indirectly affect the mortgage market. Yet there are limited data available to even attempt an econometric model of the housing market in Trinidad and Tobago. In respect of satellite accounts there are several countries for which satellite accounts in the following areas may prove useful - tourism, natural resources, the environment. There are currently no major initiatives in the area and perhaps some entities may not be aware of the importance or the potential of satellite accounts.

#### *Periodicity*

Let us now turn to the issue of *periodicity*. By and large all the published macromodels and perhaps all of those in existence in the Caribbean are *annual* models. This is clearly so for the simple reason that we as a region do not possess fairly long enough monthly or quarterly data series, which can be used for these models. Trinidad and Tobago is currently the only CARICOM country which publishes quarterly balance of payments accounts as well as a quarterly real GDP series.<sup>3</sup> The non-existence of data series such as these, particularly real sector data, is a serious limitation, as one is restricted to annual models or the compilation of pseudo quarterly series. The calculation of such pseudo series have their own problems since several of the algorithms used may not be suited to the region (for example the Lisman and Sandee method). On a more positive note however, there appears to be a wealth of monetary and financial data which are available at appropriate quarterly and monthly intervals.

<sup>3</sup> My understanding is that one country has started to compile *quarterly* BOP accounts and will publish these accounts quarterly sometime in 1995.



This state of affairs with respect to periodicity is quite unsatisfactory given rapid economic changes and the need for policy makers to have as much information available to them in as timely a fashion. Most recently, decision makers in TT have made several demands for 'first flash' quarterly real GDP estimates, about 20-25 days after the end of the relevant quarter. The Research Department has attempted to provide these estimates and at times we have had to balance timeliness with accuracy. We intend to carry out statistical checks to determine the robustness of these first flash estimates. Today the Central Bank is the only institution which provides current economic reporting on the economy of Trinidad and Tobago.

#### *Data Transformations*

What of data transformations? - nominal and real series; seasonal adjustment? Indirectly we addressed the question of the existence of real variables when we highlighted the problems associated with the revision of base years in the real GDP data. However even when data on real GDP are generally available at regular intervals it is available only by industrial origin rather than by expenditure. While the industrial origin approach provides useful insights, on other occasions the behaviour of real consumption or real investment is sometimes much more relevant. What happens in practice is that the regular users e.g. the multilateral agencies, who are interested in such series will then introduce somewhat arbitrary deflation techniques and this may be worse than an outdated series. There is some evidence of this situation in TT in the late eighties (Crichton: 1983).

A second area of data transformation is that of seasonal adjustment. It is perhaps not by accident that the use of seasonally adjusted data is generally accepted in industrialized economies, where by and large temperate climates prevail. In this regard the four defined seasons - spring, summer, autumn, winter - do impact on their economic activity - construction, agriculture. In developing economies, there are also several seasonal patterns which may be related to climatic and other factors. Nonetheless the

existence of seasonal data is something of a '*rara avis*' in this part of the world. My colleagues from the Research Department have a companion paper on this issue so I will not tread in their area of competence. Trinidad and Tobago has attempted to seasonally adjust and publish certain economic statistics i.e. the QGDP series and the monetary aggregates. Although we have encountered many problems and even suspended publication of some series, we do intend to persevere.

#### *Short Data Sets*

Another area of weakness of our statistics is that of short data sets. We shall define 'short' in different ways depending on whether we are dealing with annual, quarterly or monthly data. Nicholls (1990) suggested several ways in which the problem could be tackled and recommended Monte Carlo approaches. In our case the shortness of some of the data sets reflects new areas of activity in the economy, while in other instances they are related to the cessation of an old, and the start of a new series.

#### *Absence of Forward Looking Indicators*

The sixth deficiency relates to the absence of forward looking indicators. Data on the historical past become more and more inadequate to guide us into the future as we move into an era of trade and financial liberalisation. Although the above discussion has focussed implicitly on data for purposes of macromodel building, one may also wish to consider the leading indicator approach. Following this approach allows one to find sequences which are repetitive, explain them and then use these sequences for forecasting purposes. For the developed economies leading indicators have been developed, not only for business cycles but to forecast inflation, turning points in the stock market and in other areas. Even with the '*rudimentary*' data available in the region it is possible to derive leading indicators series.

## Some Suggestions For Improvement

In the previous section we described several data deficiencies in the economic statistics for Trinidad and Tobago. But while we criticised many of the data series published by the CSO, we are mindful of the fact that the agency is operating under tremendous pressures. There are subject to several resource constraints - human, physical and financial resources - and this has had a deleterious effect on their output. We believe however that even with the existence of these constraints, improvements can be made on the basis of information already collected. For example data on rates of return are not readily available for the non-financial sector in Trinidad and Tobago. However the basic information needed to calculate these rates of return already exist in the annual business surveys which the CSO undertakes. One may take a similar position for other data such as wealth and concentration ratios, that is, that the raw information exists in administrative records. The immediate task is therefore to use these records in as optimal a fashion as possible.

The Central Bank has done its part in the area of enhancing the economic data base by the compilation and publication of series on quarterly real GDP and quarterly balance of payments. The Bank from time to time carries out special surveys, the most recent of which has been the survey on business use of bank credit. Over the next few years it is the our intention to continue such surveys for the financial sector and where necessary to extend them to the real sector.

It is also our view that fora such as these may be used for improvement of the statistical data used in model building. These meetings provide an arena in which research on new methodologies and new statistical techniques can be presented and analysed. Irrespective of the technical sophistication of our computers and the elegance of our theoretical models, we can do nothing in the absence of data. Finally, if the RPMS intends to forecast Caribbean economies some of the issues described above must be confronted immediately and solutions found.

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