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Philippine Economic Timeseries Data Base (PETIDAS)
---Its Contents and Packaged Programmes

by

Toshiyuki Mizoguchi

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ABSTRACT

1. Introduction

This paper explains the structure and the use of an economic time series on Philippines that I constructed at the University of the Philippines' School of Economics. A small program package suitable for use with a minicomputer both on a BATCH or on ON-LINE system was designed and the initial data, consisting of the more important time series data, was written into tape. The package includes software to maintain, update, and perform calculations and statistical procedures on the data base.

The package is especially efficient when these computations are done with use of some data sets like the case of the simulation analysis, in that some kinds of data are used by multiple researchers with some different interests.

In Japan, some research institutions have made up a large scale data base. For example, the time series data base for the economic forecast of the econometric models have been made independently by the Economic Planning Agency, the Bank of Japan, the Japan Economic Research Center and Kyoto University. The long-term historical data

This paper covers the work done in the UPE with the financial support of the Japan Foundation. The writer expressed his great thanks to Dr. M. F. Santos who read the original draft and gave his precious suggestions. The supports of members of computer section of UPE were essential to complete the work.

Philippine Economic Timeseries Data Base (PETIDAS)---Its
Contents and Packaged Programmes

*Toshiyuki Mizoguchi**

I. Introduction

This is an introduction for the Philippine Economic Timeseries Data Base (PETIDAS), which was built up for the general uses in the empirical researches on the Philippine economy for the UPSE staff and students.

It is a recent tendency to arrange the data base compiled in an electronic computer when a project is expected to have a large number of computations. The attempt is especially efficient when these computations are done with use of same data sets like the case of the simulation analysis, or when same kinds of data are analyzed by multiple researchers with some different interests.

In Japan, some research institutes have made up a large scaled data base. For example, the time-series data sets for the economic forecast or the econometric models have been made independently by the Economic Planning Agency, the Bank of Japan, the Japan Economic Research Center and Kyoto University. The long-term historical data

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base (since 1880) has been arranged for the general users in the Documenta-
 tion Center of Japan Economic Statistics, Institute of Economic Research,
 Hitotsubashi University. There are, of course, cross-section data bases.
 The Japan Economic Research Center have compiled the managerial data for
 large firms. The Income Distribution Data Sets are made up by our project
 (Income and Assets Distribution Research Project).
 These data base are composed of (1) Name File, (2) Data File and
 (3) Packaged Programmes. It should be noted, however, these data bases
 are not made up by a single person or a single group. While their basic
 part was compiled through a systematic work (usually supported by a
 special research fund), they have been remarkably enlarged in their
 coverages by the requests of users who could not find figures they wanted.
 This indicates that the success of data base project depends on the colla-
 boration of multiple us
 To start the works on PETIDAS, we had to answer a question. What
 is the general work? In the cases of data bases mentioned above, it was
 not too much difficult to decide the scope of data compiled, because the
 objects were clear. But the general economic research in the case of the
 PETIDAS is too broad to decide the scope. However, we have one example
 of the data base in a similar character. The Data Base, NEED, supplied
 by the Japan Economic Research Center aims to supply the economic data for
 various researchers. For this purpose, the NEED started from the data sets
 compiled in the Monthly Bulletin of Statistics published by the Office of
 Prime Minister, Bureau of Statistics. In return for the membership fees
 for the users, the JERC has tried to increase the number of serials com-

giled in the NEED. Owing to this, the NEED has obtained the highest evaluation among various data bases. This experience seems to suggest us what kinds of data should be compiled in our starting line.

In our first step, we decided to compile the annual figures shown in the Philippine Statistical Yearbook. Annual figures from 1948 were compiled as far as data are available. While all figures are taken up as the candidates to be compiled, data restricted to one year are excluded owing to the nature of data bases. In order to save input costs, figures are shown, in principle, within 5 places, even if more detailed information is obtained.

The next problem is how to compile the figures on the data base. An easy-going way be to compile them in the ready made programmes such as the SPSS. However, most of these packaged programmes request the middle-scale computers and the rental fees are required. So we took a rather troublesome way; to write down a small packaged programme by ourselves. Our system can be used either (a) in the BATCH system (usually adopted in the MINI-computer) or in (b) the ON-LINE system. While the following explanation concerns on (a) with the consideration of the FACOM U-300 computer of the UPSE, the reader can easily use the ON-LINE system if he can refer the forthcoming brief manual.

II. Outline of the PETIDAS

The PETIDAS has three kinds of files. The first is labelled as the DATAFILE. This composed of about 2,000 time series data from 1948 to 1985 (some of figures are, of course, should be added in the future). These

serials are grouped by the nature of series and named like as AGRICULTURAL STATISTICS. A group contains at most 97 serials and is titled in like as DATABASE 003.

Each serial in the datafile can be identified by three kinds of number: (1) Data Base Number, (2) Serial Number (2 places) and (3) year (5 places). For example, the serial with number of 0032501973 is found in Data Base 003, Serial number 25 and 1973 year's figure. The DATAFILE is compiled in the MAGNETIC TAPE, and any serials can be called with use of the packaged programme which is explained in the latter part of this section.

The second is the NAME FILE which contain the name list of serials compiled in the DATABASE. This file is also compiled in the MT next to the DATAFILE, but in the case of BATCH system, it is more convenient to refer the output list rather than to seek the name through packaged programmes.

The third file is the PACKAGED PROGRAMMES. In the on-line system, all these programmes are to be compiled in disks. But in the BATCH system in the MINI-computer, we must rely on the input of IBM cards written by the FORTRAN. These programmes are subgrouped into four.

- (I) DATA INPUT-MAINTENANCE PROGRAMME,
- (II) SERIAL NAME INPUT-MAINTENANCE PROGRAMME,
- (III) DATA CALL AND CALCULATION PROGRAMME, and
- (IV) SERIAL NAME CALL PROGRAMME.

Since the final one can be used only for the ON-LINE SYSTEM, we shall explain here only From (I) to (III).

The Programme (I) is originally made for the data base-maker and its chargers. The programme can transfer systematically the data from IBM cards to the DATA FILE or replaces the figures in the file to those from IBM cards. But users can use the programme not only for the copy of the Data FILE to their personal tape but for the build-up of their own database through the addition of some new data sets which they are interested in. The programme (II) is made for the data base maker to compile the serial name list, and so usual users have few chance to adopt this. The interested readers should refer the Appendix of this paper.

The most important programme for the data base users is the DATA CALL and CALCULATION PROGRAMME. With the programme, they can call figures compiled in the DATA FILE only by assigning the period of their study, the data-base and serial numbers and the time lages if any. While they can continue their calculations after the first data call, it is advised that he should investigate the outputs for the called data from the LINEPRINTER because some mistakes arise from the lack of call data.

The called figures are compiled in MAIN MEMORY designed as $X(i,t)$ ($i = 1, 2, \dots, 49$, $t = 1948, 1949, \dots, 1985$). The i is decided in order of calls. Note that the time lag operation has been done in this stage. The data calls can be done through the input of small number of IBM cards after the program. For example, if we want to call figures from 1960 to 1971 of serials, No. 23 and 25 of DATABASE 1, and of No. 4 and

11 from DATABASE 2 with one year's lag (that means from 1959 to 1970), it is enough to input four cards:

10 or 11

0196001971

0010000023000025

002010000400011

Blank card

MT Reader Device

Year from 1960 to 1971

DB 1, Serials 23 and 25 with 00 time lag

DB 2, Serials 4 and 11 with 01 time lag

Details of coding format will be explained in the subsequent section of this paper.

The calculation programme contains most of calculations used in the ordinary empirical researches in the economy, although this does not includes the econometric techniques belonging to the simultaneous equation estimation owing to the limitation of main memory. We can apply these calculation by the inputs of IBM cards assigned the calculation number and the serial numbers in the memory to which the calculations are applied for. For example, the data calls and calculation for the estimation of the personal consumption

$$C = a + b Y$$

where C and Y are the real personal consumption (per capita) and disposable income (per capita), are done by the cards of

10 or 11

0197001980

0010000001

02100000270008700089

Blank card

0100000030200003

02000-000400002

MT Reader Device

Year from 1970 to 1980

Data Call Section

End of Data Call

Calculation Section

(To be explained later)

02000-00510000200050

02000-00010005100052

070000005200051

Blank card

End of Calculations

The users can compile the calculated results for his personal tape if they want by adding TRANSFER TO MT card.

III. Contents of Datafile and Namexfile

The DATAFILE contains about 2,000 serials in the first input.

The number of serials is expected to rise in the future through the requests of users. These serials are classified into 23 DATABASE's. The standard of the classification, in principle, depends on chapters in the 1980 Philippine Statistical Yearbook, although some minor changes were done by the writers. The name of DATABASE is as follows.

Database	1	Population and Vital Statistics
	2	------(ii)
	3	Agricultural Statistics
	4	------(ii)
	5	Fishery and Forestry Statistics
	6	Industry and Establishment Statistics
	7	------(ii)
	8	------(iii)
	9	------(iv)
	10	Transport, Communication and Tourism Statistics
	11	Monetary and Banking Statistics
	12	------(ii)
	13	Social Services and Social Security Statistics
	14	Public Finance Statistics
	15	Energy and Water Resource Statistics
	16	Foreign Trade Statistics
	17	------(ii)
	18	Price Index
	19	Family Income and Wage Statistics
	20	Education Statistics
	21	National Accounts Statistics
	22	------(ii)
	23	------(iii)

Most of time-series shown in the Yearbook are compiled in the DATAFILE.

However, to save the input costs, figures are omitted when they are easily obtained from other figures compiled in the DATAFILE. For example, while the Yearbook shows the demographic data, by both sexes, male and

female, we compile only the figures for both sexes and male only because female figures can easily come out as the differences in these serials. When the 'total' is compiled, the minor item like the miscellaneous is not compiled. Further, the Yearbook shows same data in multiple tables but we compile the serials only in a part, although we treat the National Accounts Statistics as an exception regarding this aspect.

Figures in the DATAFILE are restricted up to 5 places in order to save the input costs. While this writer believes that this is sufficient for empirical researches when we remember the reliability of economic data, he, of course, welcomes to revise figures in more detail by users. One should take care when he uses the indices because these are shown with the base 1,000 not by 100. For the fiscal years or school years, like 1955-56, the figures compiled in the beginning year, 1955.

The data are compiled to use the information in the Yearbook before 1982. It is well known that the figures have been revised as years pass on, so the writer hopes that users check and revise the DATAFILE when new yearbooks come out.

The NAMEFILE is used to seek the serials for researches and compiled in the MT. In the ON-LINE SYSTEM, one can seek the names directly from the file. However, on the BATCH SYSTEM, it would be much efficient to investigate the output of the LP in the computer room.

The file for a serial is composed of (a) DATABASE and Serial number, (b) the title of serial and (c) the unit of serial. The title is usually written in two lines: One is the general character of serials

and another is the detail specialization. For example, there is an indication in the foreign trade statistics like

Volume of Export

T/T Coconuts

The units include both the numeral values and the measures. TP means thousands Pesos. For ten, hundred, million and billion, we use 10, H, M and B. So HMP means hundred millions Pesos. D is used to indicate U.S. dollars. Measures other than currency units are characterized with a slash. For instance M/T means millions tons. When we judge that there are few chances to arise misunderstandings, the slash is omitted. Further, some comments on the units are attached in the title when the units are not too familiar ones.

IV. Personal Database

While the PETIDAS are considered to be sufficient for the ordinary empirical researches with use of time series data of the Philippines, one may want to make up his personal data base because of two reasons. Firstly, he may consider that he uses only a part of DATAFILE, for example DATABASE 21, 22, and 23 (National Accounts), so he wants to save the Data call times by compiling the small scale database. Secondly, one may add some data in addition to the PETIDAS, but these are too specific for the general uses, for example figures estimated by himself. The programme 1, the DATA INPUT AND MAINTENANCE PROGRAMME, can be used to compile the personal database although the programme is made up for the use of database makers and chargers.

The copies from the DATAFILE to the personal tape can be done by the DATABASE as their unit. What one should do is to input the following cards after the programe.

- (1) A card with 1 in the first column.
- (2) xxx9801986 for each DATABASE, where xxx is the DATABASE number. cards should be input in order of the DATABASE number.
- (3) card with 9999801986 in first 10 columns.

When one wants to add the data, input the data cards after (2). The DATABASE number from 900 to 996 are assigned. Each DATABASE can contain at most 97 serials. The data cards should be the following FORMAT.

DATABASE NUMBER(I3), SERIAL NUMBER(I2), BEGINNING YEAR OF DATA :
CONTAINED IN THE CARDS(I5) AT MOST 7 DATA(F10.2).

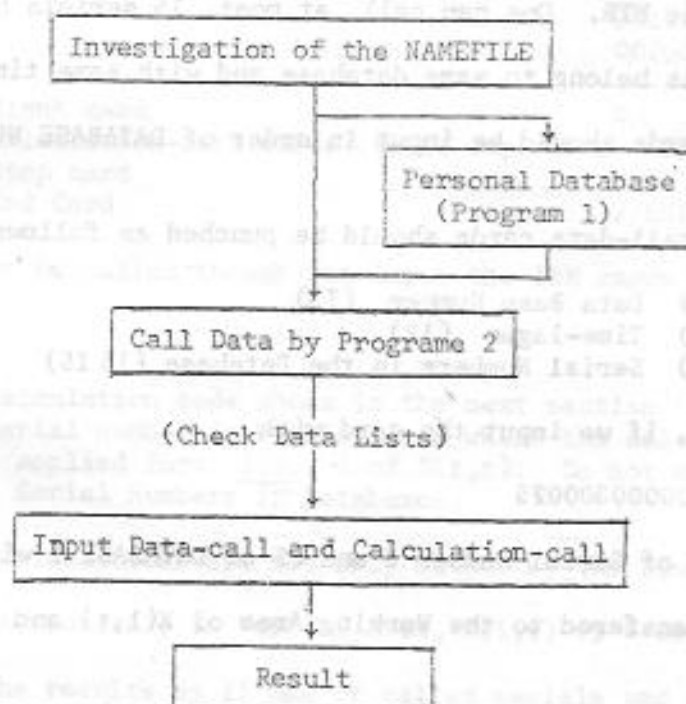
For example a card shown as

9932501972052347.210132000.00

can input 52347.21 and 132000.00 as the data for 1972 and 1973 in Serial number 25 of DATABASE 993. Note that the decimal point and the minus sign, if any, are included in F10.2. However, it should be noted that the addition of data with uses of the personal database is preliminary in its nature. Users should request to include the serials for the PETIDAS for the chargers because the attempt is very important to improve the PETIDAS.

Diagram 1

How to Use the PETIDAS



V. Data Call and Calculation Programme

To proceed the empirical researches, we need to call serials from the PETIDAS' DATAFILE or the our personal DATABASE produced through the process shown in the previous section. While the MT of PETIDAS is designed to be set in MT Reader 11, the Personal DATABASE's MT is designed to be set in MTR 10. The programme 2---DATACALL AND CALCULATION---can be used in both cases only through the input of one card with 10 or 11 from the top. At most 49 serials can be transferred from the MT to the Working Area of Main Memory. One should note that since the time-lag operations have been done the serials with time lages are treated as if their original serials.

Data can be called by the IBM cards followed to the head card assigning the MTR. One can call, at most, 15 serials by one card if these serials belong to same database and with same time-lages. The call-data cards should be input in order of DATABASE NUMBER.

The call-data cards should be punched as follows:

- (i) Data Base Number (13)
- (ii) Time-lages (12)
- (iii) Serial Numbers in the Database (15 15)

For example, if we input the card with

0010000000300025

the figures of Serial Number 3 and 25 of DATABASE 1 without time-lage (00) are transfered to the Working Area of $X(1,t)$ and $X(2,t)$.

Users must also input the card to show the range of years they want to call between the card assigning MTR and data cards. This card should take the form of

0197001980

which means t runs from 1970 to 1980. To order the computer the end of data-calls, a blank card should be attached after the final data call card. The list of figures called are automatically printed by the LINE PRINTER. When we continue the calculations, the calculation-call cards should be attached after the blank card. But if users want to stop work in order to investigate the called figures, input two cards of

999

//END

In sum, the input cards should be ordered as follows:

(i)	Assignment of MTR	10 or 11
(ii)	Range of years like	0197001980
(iii)	Data-call cards in order of DB like	001000002300031 001010002300001 00200000005
(iv)	Blank card	0
(v)	Calculation-call cards (to be explained---and may be omitted)	
(vi)	Stop card	999
(vii)	End Card	//END

Calculations can be called though the input the IBM cards in the following forms.

- (i) Calculation code shown in the next section (15)
- (ii) Serial number in Working Area which the calculations are applied for: i.e., i of $X(i,t)$. Do not mix up the Serial Numbers in Databases.

The results of calculations are not only output by the Line Printer but also deposited temporarily in Working Area, $X(i,t)$ ($i = 50$ -----). Thus one can treat the results as i one of called serials and apply the calculation programmes. Calculations packaged in the PETIDAS are grouped in 9 categories. They are

- (1) Addition and Subtraction
- (2) Multiplication and Division
- (3) Weighted Sums and Weighted Averages
- (4) Index Calculation
- (5) Transformation of Variables
- (6) Correlation Matrix
- (7) Regression Analysis
- (8) Fiting Trend
- (9) Miscellaneous calculation.

The last include the transfer programme from $X(i,t)$ to $X(j,t)$ or the adjustments of Fiscal year's data into the calendar year's data. When all calculations are over add two cards as was explained: i.e., cards with

999
//END.

Unfortunately, the scale of memory is too small to compile all category of calculations in the case of the FACOM 300, although the FACOM (FACOM #M140) in the Transportation Training Center of UP can accept the packaged programme. Thus, the standard form of the PETIDAS includes only the calculations belonging to the categories (1), (2), (7) and (9). But one can easily replace the categories through the replacement of cards.

- (i) Replace the red cards in the final part of programmes
- (ii) Add the calculation block.

To do this, it is desirable to consult the programmers in advance.

When the FACOM 300 informs the users that its memory is too small for the calculations requested, users can proceed the calculation by dividing to two stages and sending the results of the first stages for MT with use of 09005 and 09006. In the second stage calculations, only the blank card should be input for the data call part. That means

- MT device card
- Year card
- Blank card
- Calculation cards
- Blank card

are sufficient for the second stage calculations. However, frankly speaking, the use of FACOM M 140 is much more efficient for the large number of calculations.

VI. Detailed Explanations on Calculation Programs Packaged

The PETIDAS as the Packaged programmes as follows. The number of calculation programmes will increase through the requests of users, but the programmes would be sufficient for the usual empirical studies.

The number in the parenthesis is the calculation codes shown in 5 places. Since each calculation call card can call 15 series, let us indicate number of serials (i of $X(i,t)$ as $N(i)$). $N(i)$ takes 5 columns like 00023, but when the minus sign is attached (owing the assignment of calculation programme) four columns are used for numbers like -0023. For $N(i)=0$, the calculations are not applied for. Further, let us remember that t runs the period assigned according to the second card of data call cards.

It is important to remember, while the results of calculations are compiled temporarily in the Working Area, the results are cleared up when the same calculations are used. In this case, one need to transfer the results to other memory like $X(97,t)$ with case of Transfer Program if he wants to use the results in the forthcoming calculations as the input.

(01000) ADDITION AND SUBTRACTION

- (1) Add the card 01000 in the top.
- (2) All serials are summed up and deposited in $X(50,t)$ shown in the following columns
- (3) When minus signs are added to the serial numbers, the subtraction in place of addition is applied for -

-----Example 1-----

0100000000300004-0002 means

$X(50,t)=X(3,t)+X(4,t)-X(2,t)$

where t runs the period assigned in advanced (in the following examples, this note will be abridged)

(02000) MULTIPLICATION AND DIVISION

- (1) Add the card 02000 in the first five columns
- (2) Serials of $N(i)$ ($i=2,3,\dots,15$) are multiplied by $N(1)$ -th serial when $N(1)$ is positive. If the minus sign is added to $N(1)$, the divisional operation is applied for in place of multiplication.
- (3) The results of calculations are deposited in $X(51,t)$ to $X(64,t)$.

-----Example 2-----

02000000030000100002 means

 $X(51,5) = X(3,5) \times X(1,t)$ $X(52,t) = X(3,t) \times X(2,t)$

-----Example 3-----

02000-000300001 means

 $X(51,t) = X(1,t) / X(3,t)$

(03000) WEIGHTED SUM

- (1) Two cards should be input in this case.
- (2) For the first card, punch 03000 and $N(i)$ ($i=1,2,\dots,15$).
- (3) For the second, punch 03002 and Weights $W(i)$ ($i=1,2,\dots,15$).
- (4) The result is deposited in $X(65,t)$.
- (5) The weight should be FORTRAN FORMAT I5.

-----Example 4-----

0300000000100002

0300201000000001 means

 $X(65,t) = X(1,t) \times 1000 + X(2,t)$

This programme is efficient to add the serials with different units.

(03001) WEIGHTED AVERAGE

Operation is perfectly the same except for first column punch 03001 and the result is compiled in $X(66,t)$

(04000) INDEX CALCULATION

- (1) Punch 04000 from the first 5 columns
- (2) $N(1)$ should be the base year of index and be shown like as 01973.
- (3) $N(i)$ ($i=1,2,\dots,15$) can be indexed and deposited from $X(67,t)$ to $X(80,t)$

-----Example 5-----

040000197600001 means

 $X(67,t) = X(1,t) \times 100 / X(1,1976)$

(05000 + x) TRANSFORMATION OF VARIABLES

- (1) Punch (05000 + x) in the first 5 columns
- (2) Transformation is as follows
 - x 1, Natural log
 - x 2, Squares
 - x 3, Reciprocal
 - x 4, First differences (beginning from 2nd year)
 - x 5, Set time trend for assigned number
 - x 6, Exponential

- (3) The results are compiled as the same work area as the original serials.

-----Example 6-----

0500100001 means

$$X(1,t) = A \log x(1,t)$$

(06000) CORRELATION MATRIX

- (1) Punch 06000 in the first 5 columns.
- (2) Punch N(i) (i=1,2,---,15), then the correlation matrix for at most 15 variables are printed by LP.
- (3) Note that the correlation here is not adjusted by the degrees of freedom.

(07000) REGRESSION EQUATION (see Also (A.4) in Appendix)

- (1) Punch 07000 in the first 5 columns.
- (2) Indicate the serial number of Working Area of regressand in N(1).
- (3) Add the number of regressors from N(2) to N(15)
- (4) The following items are printed by the LP.
Regression coefficient, their standard of deviations, and multiple coefficient.

(08000) FITTING LINEAR TREND

- (1) Punch 08000 and serial numbers in the working area.
- (2) The results with use of the LS method are shown in the LP.

(08001) FITTING EXPONENTIAL TREND OR ESTIMATES OF GROWTH RATES

(Same as 08000)

(09001) CONVERSION OF DATA FROM FISCAL YEAR (B.Y.) TO CALENDAR YEAR (E.Y.)

- (1) Write 09000 from the top.
- (2) Next, write one serial number (I5) and the beginning year and the end year of conversion, then the conversion figures from B.Y. + 1 to E.Y. are deposited in the same memory.
- (3) If the figure for the calendar of E.Y. + 2 is obtained and can be shown in (I5), add 1 in the fourth column and a card with 09002 DATA (F10.2) then the converted figure of E.Y. + 1 is obtained.

(09002) CONVERSION OF SCHOOL YEAR TO CALENDAR YEAR

(Same as 09001)

(09003) TRANSFER OF SERIALS IN WORKING AREA

- (1) Write two address IB (I5) IE(I5) in the next to 09003, then the contents in IB is transferred to IE.
- (2) Use the calculation to deposit the results when same kinds of computations are repeated.

(09005) TRANSFER THE MEMORY IN WORKING AREA TO MT

- (1) Write only 09003, then all memory in the working area transferred to MT (Use the other MT than the DATAFILES).

(09006) READ THE MT PREVIOUSLY TRANSFERRED BY 09003

- (1) Write only 09004, and set the tape 10 when the first card 11 (11 when the first card 10), then other calculation can be continued. (No data card should be input in this programme.)

V. Final Remarks

✓ The PETIDAS is the first attempt to compile the economic data of the RP systematically for the general economic researches. The writer knows that there remain many deficits to be improved in the PETIDAS. While the compiled figures are checked twice, but according to past experiences, there would remain some mis-inputs in the DATAFILE. The packaged programmes are also examined in detail and should be improved to a more convenient form.

However, it is also true that these improvements will be promoted through the requests of database users. It is this writer's consideration that the PETIDAS should be open to public in order to get the critics which are the most important factors to develop the data base works.

Appendix

SOME ADVICE FOR PROGRAMMERS

(A.1) Variable and FORMAT

All programmes of the PETIDAS are designed to be adopted for the FACOM 300 Mini-computer. But one can easily to use in the other computers with FORTRAN COMPILER if the following variables are defined.

MC: Car Reader
ML: Line Printer
MR: MT read
MW or MT: MT write.

In order to extend the period covered or to increase the number of data base,

KLY: Number of years compiled
KBY: Beginning of year of DATAFILE
KDR: Number of Databases

should be changed.

The read FORMAT of DATABASE from MT is

```
READ(MR,xxx)J1,J2,J3,J4(X(K,M),K J2,J3)
xxx FORMAT(I3,3I2,7F10.2)
```

where J1, is DATABASE number, J2 and J3 are serial numbers and J4 is year minus 1947. The read FORMAT of the NAMEFILE is

```
READ(MR,xxx)J1,J2,J3,(X(k), K 1,19)
xxx FORMAT(I3,I2,I1,18A4,A2)
```

where J1 is DATABASE number, J2 is serial number and J3 is defined as follows:

J3 0 Main Title
J3 1 Subtitle followed to the Main Title, and
J3 2 Subtitle whose main title is same as the previous one.

(A.2) How to Call and Revise Name File

For the call of Name File, Use the Name Call Programme and Input the number of MT device (10 or 11 in the case of FACOM 300). The all contents are printed out by the LINEPRINTER. For the Revision, use the Name Input and Maintenance Programme and input the card following the Read FORMAT for the NAMEFILE shown in (A.1). The revised results will compiled in the MT settled in other MT device.

(A.3) Revision of DATAFILE

The revision can be done in following the same method as the compile of personal DATABASE. What is different, revised figures are input instead of dummy cards in the case of the **personal** database. The FORMAT should take the form as is shown in (A.1). The revised results are obtained in the other MT device.

(A.4) Some Regression Analysis

In order to keep the number of cards for the programmes, the regression analysis in the major programme do not include the calculations for Durbin-Watson Statistics as well as the partial correlation analyses. Those who want to do such a work, use the calculation 7001, then the data are output to the MT. Then apply the Programme V (Detailed Regression Analysis), one can satisfy the statistics in this calculation. The programme will be available after August, 1983.