element of B.

Elmult	Multiplies each element of A by the corresponding element of B.
Minus	Subtracts B from A.
Mult	Multiplies matrix A by Matrix B
Plus	Adds matrix B to matrix A.

Conclusions and the benefits of using a computer

Conclusions

It can be seen that a computer does not merely reproduce a manual process but gives a new dimension to the choice of methodologies available. At the same time one must not become too sophisticated in the type of processing envisaged and always remember that the quality of the original data will be the greatest constraint in such work. Otherwise much unnecessary time, effort and error will result.

Consistent treatment

It is almost certain that such a thorough series of adjustments on a firm by firm basis would have been out of the question without the power and speed of a computer. Neither would it have been possible to compare individual establishments for consistency. Without a computer it would have been necessary to gross up the data in the raw state and carry out modifications later hoping that local biases and errors would largely cancel out.

Even the manual sectors are also more likely to be consistent since the rules for computation and conventions to be followed have (of necessity) been specified precisely.

Handling large amounts of data

It was undoubtedly helpful to be able to store, process, access, alter, sort and print so much data conveniently. The computer would have been valuable even if it had been used only as a filing system.

Keeping the original data

Up to the balancing stage (stage 8), whenever our results showed us errors in the data, we always corrected the original data and reran the programs. This meant that we did not have to remember a set of manual alterations or other 'corrections' which would be necessary the next time the programs were run.

Updating

The greatest benefit from using a computer could be realised when updating the table. If the raw data and the programs to process it are still available, it is far easier to update a computerised table. It can be done quickly and approximately by making new price adjustments, altering the control totals and rebalancing. Alternatively more data can be added to extend or replace the original data. This technique will only be partially possible for the Scottish table because it has been necessary to overwrite several elements of the table at the balancing stage when external knowledge contradicted the computed values.

The data is available for fresh projects

This consistent data base is still available for further economic investigations and analysis of the Scottish economy.

The data collected on this project would also allow further work on input/output models, for example to estimate the accuracy to be expected from the forecasts generated from input/output models.

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Book review

Program Flowcharting for Business Data Processing, by Barry J. Passen, 1978; 251 pages. (*John Wiley*, £6·50)

The book endeavours, and I think succeeds, in putting interest and humour into what so easily could be a very dull subject. It assumes a nil knowledge of program flowcharting, but allows the reader to enter at his own level, which works well until one finds the 'introduction to data processing', on page 225. Following the decision log advocated in the book I'm sure this introduction should be elsewhere. This decision logic and decision tables, which are an important part of the book, are well covered by the author, but it is important to recognise the limits of the book. Such an important item as file organisation is not included, presumably as not being covered by the title.

The technique used equates to the programmed learning system of a language laboratory. In this sense it is an admirable textbook with which to start inhouse training of programmers and analysts. This is a matter which of necessity is close to the heart of most Data Processing Managers with tight budgets, as it is almost impossible to replace by advertisement staff swallowed up by the 'perks' machine.

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