Welsh Economic Review
**Welsh Input-Output Project Update**

**Introduction**
Input-Output Tables provide a financial picture of an economy, showing domestic and international trade flows between different industries, consumers and government sectors during a particular year. This accounting framework enables inter-industry transactions (sales and purchases) to be mapped and quantified, enabling detailed descriptions of economy interactions, whilst manipulation of these tables allows the effects of changes in that economy to be estimated, via calculation of economic multipliers.

Input-Output (I-O) tables are produced regularly at a UK level, as part of the national accounting process. They have been less available at a regional or local level within the UK. However, I-O tables are now regularly produced for Scotland (by the Scottish Executive) the South West of England (by the South West Economy Centre, Plymouth Business School), and Wales (by WERU).

The Welsh Input-Output Project is now in its fourth phase of development. Welsh tables relating to 1994, 1995 and 1996 have been already been produced during phases 1-3, with a separate sub-regional table for industrial South Wales also compiled for 1995 and 1996. Phases 1-3 were sponsored by a sub-group of the South Wales Economic Research Forum, a group comprising largely of local authorities, TECs and the WDA.

**Welsh I-O Tables**
The most recent Welsh I-O tables relate to the economy in 1996. These tables contain 67 separately defined industry groups or sectors, including 35 manufacturing sectors, 25 service sectors, plus energy, agricultural and construction sectors. These tables were constructed using survey data generated from purpose-designed I-O questionnaires as well as information obtained from various WERU projects, together with other published and unpublished data. For sectors where little or no survey data were available, non-survey methods were applied to estimate transactions (for a more detailed account of the methodology see Brand, S. Hill, S., and Roberts, A., 1998, Welsh Input-Output Tables for 1995, University of Wales Press, Cardiff).

The table below presents an aggregate version of the 1996 Welsh tables, where the Welsh economy is divided into 7 separate sectors. Purchases by sectors are shown in the columns, whilst sales are shown in the rows. For example, according to I-O estimates, and reading down the column, the Welsh manufacturing sector purchased an estimated £220m from the agricultural sector, £1.77bn from other manufacturing sectors etc. Total intermediate purchases from other Welsh sectors summed to £4.4bn. In addition, manufacturing sectors purchase labour inputs, imports, second hand/recycled products, and pay taxes and generate other value added (gross profits etc), giving total inputs (which

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**Income from Employment**
- Gross wages and salaries including employers NIC etc, plus self-employed income.

**Imp from the rest of the UK**
- Imports from the rest of the UK.

**Imp from Overseas**
- Imports from Overseas.

**Sales by Final Demand (purchase of second hand equipment etc)**
- Sales by Final Demand.

**Taxes less subsidies**
- Taxes less subsidies.

**Other Value Added (Gross profits, rents etc)**
- Other Value Added.

**Full-time equivalent employees and self-employed**
- Full-time equivalent employees and self-employed.

**Consumers expenditure**
- Consumers expenditure.

**General Government Final Consumption**
- General Government Final Consumption.

**Gross Domestic Fixed Capital Formation**
- Gross Domestic Fixed Capital Formation.

**Value of the physical stock change**
- Value of the physical stock change.
equal gross industry outputs) of £26.45bn. The final row of the table shows estimated employment in terms of full-time equivalent jobs. The project also further disaggregated employment into different occupation types.

Reading across the manufacturing row, the sector sold an estimated £96m to the agricultural sector; £1.77bn to other manufacturing sectors etc. Total intermediate sales to other Welsh sectors were an estimated £3bn. In addition, consumers in Wales purchased manufactured products, with manufacturing output also purchased for investment. Manufacturing sectors in Wales sold an estimated £7.5bn of goods overseas, with a further £14.2bn sold to the rest of the UK.

Applications
The I-O tables enable the sectors of an economy to be described in terms of size (employment, output and GDP contribution), import or export intensity, local purchasing, labour intensity etc.

The other main use of the tables is to predict the economic consequences of changes by tracing impacts through supply chains. For example, if a manufacturing industry expands, perhaps because of a new export order, then that industry will require extra inputs (including labour) to satisfy the extra demand. Suppliers to the industry in turn will then also require extra inputs etc. The I-O tables allow the effects of these changes to be estimated by calculating the flow-on, or multiplier impacts. Multipliers can be calculated for output, income, employment (including by occupation) and GDP. In a similar way the tables can be manipulated to explore the possible outcomes of policy changes, and to assess the relative significance (including indirect incomes, jobs, etc supported) of different sectors.

Examples of recent WERU projects involving the I-O tables include an assessment of the economic significance of Arts and Cultural Industries in Wales, the Forestry Multiplier study, Tourism Planning Model for Wales, and the potential economic effects of infrastructure development (a full list of WERU projects can be found on www.weru.org.uk).

Developments – Phase 4 Onwards.
The present phase of the Welsh I-O project, to further develop ‘core’ (all Wales level) tables is being financed jointly by WDA and Cardiff Business School and involves:

- Updating – the first stage (due to be completed by the end of March 2000) will update (using new survey data) the Wales level table, to 1998. Subsequent years will update further. This updated table will detail trade flows within Wales, estimate exports and imports by sector, and provide occupational disaggregations.
- Methodological changes, reflecting UK changes in relation to European System of Accounts (ESA).
- Other methodological developments, such as incorporating supply-side constraints and changes will be explored.

Additional to the development of the core project, a number of further complimentary extensions are possible, including:

- Environmental analysis. WERU is currently exploring methodologies for including environmental extensions to the I-O tables. This would allow the environmental impacts of actual or potential economy changes to be simulated.
- Modelling qualification and vocational skill use
- Development of sub-regional models.