

ECONOMIC DEVELOPMENT STRATEGY

DATE: 13 December 2000

VENUE: Committee Room 1, National Assembly Building

TITLE: NEDS - Sectors and Clusters

Purpose

1. To assist the Committee in their discussion on NEDS.

Background

2. It was agreed that the Committee would find it helpful to have an evidence paper on the growth sectors of Wales and the incidence of clusters within Wales.

Conclusion

3. The Committee is invited to comment on the sectors they see as critical to NEDS.

Economic Policy Division
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National Economic Development Strategy

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Sectors, Structures and Strategies

4 Introduction

4.1 The structure of an economy is a summary term given to the way that an economy is made up. It is usually expressed in terms of the sectoral composition of output or employment. Structural change is a common feature of market economies, and a familiar process in Wales.

4.2 The structure of a market economy can change for a variety of reasons, including:

- Depleted resources, such as the exhaustion of coal reserves in Wales, (although even here depletion is a market phenomena, implying that the cost of extraction exceeds the market value of the product, rather than physical exhaustion).

- Technological advances, such as the digitisation of broadcasting constraining future markets for analogue televisions, or the introduction of the internet changing purchasing patterns.
- Changes in factor prices and process technologies leading to shifts in production methods, (such as the introduction of capital-intensive steel-making in place of labour-intensive methods). Even here markets are important, since businesses are always looking to replace expensive inputs with cheaper ones.
- Variations in tastes, such as the beef crisis and its effects on agricultural markets. It is an interesting question whether producers can engender tastes (and hard to argue the intrinsic need for Pokemon cards, for example).
- Financial fluctuations, such as the decline in the value of the Euro, (adversely affecting export-intensive Welsh manufacturers), or changes in interest rates.
- Serendipity, depending on luck, fortune and the enterprise and vision of individuals (the media sector in north west Wales, for example).

1.3 The most important influence on the structure of an economy is competition, introducing new products and processes as existing products mature and then decline. The fastest growing economies are those with the most competitive businesses, introducing new ideas and new products (innovating), and identifying and exploiting new market opportunities. Seeking influence in such a scenario is a serious challenge to the public policy maker. The simple extrapolation of previous trends is a dangerous approach – to take an obvious, if dramatic example, between 1901 and 1931 direct employment in mining in Wales increased from 140,000 to 270,000. By 1951 it had fallen back to 100,000, with subsequent further decline (figures from Bryan and Jones (eds), 2000).

1.4. The introduction of new products and processes into an economy can happen in many ways, including the entry of existing firms from elsewhere, transferring technologies and ideas, the creation of new firms with new ideas and processes and changes in the behaviour and activities of existing firms. Hence the close relationship between structural change, innovation and enterprise and the importance of the commercialisation of ideas.

1.5 Structural change imposes substantial costs on the economy in terms of under-utilised resources and associated social costs, particularly where structural change involves large employers and dependant communities. Yet structural change is ultimately beneficial to the economy as a whole, releasing resources (including people) into more productive use, although not necessarily at once. It is increases in productivity, often as a result of structural change, that provides the driving force for increases in living standards over time.

1.6. The most important lesson is not the inability to predict, important though that is. It is the inability to stand in the way of structural change. Expensive support for declining industries can delay structural change, but it cannot prevent it. Industries grow and decline for all the reasons set out

above. Structural change is market driven, responding to the price signals that are fundamental to resource allocation.

1.7. It is sometimes argued that structural change occurs because of management's failure to invest in new physical capital. However such lack of investment is the consequence of structural change, rather than its cause. Businesses don't invest when they cannot anticipate a return on that investment – it is the lack of profitability that limits investment, and not the other way round.

1.8. This paper examines the contemporary structure of the Welsh economy, and its evolution over time, concentrating on the opportunities for (and limitations of) policy interventions. Given that structural change is largely the product of market forces, it argues that the primary opportunities for policy intervention lie in creating the appropriate environment and conditions under which value-adding sectors will grow, rather than in the identification and stimulation of individual growth sectors.

5 The Structure of the Welsh Economy

5.1 This section outlines latest available figures on the structure of the Welsh economy and its evolution over time. Given the time-lag between economic activity and its quantification and categorisation, it is inevitable that the classifications used are backwards looking, describing the economy as it was rather than is, and using categories that made sense in the past rather than now. Official statistics are usually presented in terms of the Standard Industrial Classification (SIC), relying on similarities in production processes to categorise output (and employment). Whilst the anomalies of this system are well known, it does provide a consistent basis for comparisons across time and between regions. The SIC is subject to periodic revision, seeking to bring the categories up to date, typically every decade or so. The latest system was re-weighted in 1992, and is hence referred to as SIC92. Whilst more frequent revision would appear sensible, it would also make comparisons over time more difficult.

5.2 Given the categorisation in terms of similarity of production process, some important elements of the economy are difficult to discern. For example tourism activity will be captured in a number of sectors including recreation, travel, hotels and restaurants etc, in each of which tourism activity will be mixed in with normal business and domestic activity. Similarly "new economy" companies will cut across sectors such as professional services, media, software etc. There are obvious dangers in seeking to use categories which were defined in 1992 to describe the modern economy. Moreover economists seeking to analyse markets would categorise sectors in terms of the degree of competition between firms, rather than similarities in production processes, a process that is imperfectly reflected in SIC's.

2.3 Table 1 below provides data on the structure of the Welsh economy. The most important differences are the much higher than UK average share of GDP from manufacturing in Wales, and the lower share of GDP from private

sector services. Whilst many of the Wales/UK differences reflect substantially different economic histories, in some ways the differences are less than may be expected. Agriculture, Forestry and Fishing, for example contribute little more to Welsh GDP than the UK average, as does Extraction (mining and quarrying).

Table 1 The Structure of the Welsh Economy

% GDP by Sector	Wales	UK
Agriculture, Forestry and Fishing	1.8	1.5
Mining, quarrying of energy producing materials	0.3	0.3
Other mining and quarrying	0.4	0.2
Manufacturing	27.9	21.3
Electricity, Gas, Water	2.2	2.3
Construction	5.4	5.3
Wholesale and retail trade (including motor trade)	10.5	12.3
Hotels and Restaurants	3.5	3.2
Transport, Storage and Communication	6.1	8.3
Financial Intermediation	3.6	6.3
Real estate, renting and business activities	14.6	20.1
Public Administration and Defence	6.4	5.5
Education	6.1	5.6
Health and social works	8.8	6.6
Other Services	4.8	4.9
Financial Intermediation Services Indirectly Measured	-2.2	-3.7

Source: National Statistics

2.4 The continuing prosperity gap between Wales and the UK average is well documented. The evolution of the industrial structure of Wales is an important part of the explanation of that prosperity gap. Put simply the Welsh economy is, compared to the UK average, dominated by sectors that are, in a UK context, slow growth. This is illustrated by Table 2. The first two data columns set out the sector share of Welsh GDP divided by the UK average. Hence if the sector contributed exactly the same share to GDP as the UK average, the figure would be 1. A figure greater than this shows the sector as more important to Wales than to the UK; and conversely for a figure less than one. Hence in 1998 Manufacturing's share of GDP was almost 40% higher in Wales than the UK average, whilst Financial and Business Services contributed less than 60% of their UK GDP share. The data shows Wales becoming relatively more specialised over time in Manufacturing and Public services, and relatively less specialised in Traded Services.

2.5

Table 2 Specialisation of Welsh Industry and Relative UK Sector Growth

	<u>Specialisation =% of Welsh GDP/ % of UK GDP</u>		Index of Growth UK=100
	1981	1998	1981-1998
Primary & Energy	1.88	1.17	62
Manufacturing	0.99	1.39	77
Construction	1.06	1.09	109
Distribution, Retailing & Catering	0.86	0.87	132
Transport & Communications	0.83	0.68	186
Financial & Business Services	0.71	0.55	222
Public Admin, Education & Defence	1.11	1.23	39
Other Services	1.02	1.00	176

Source: Regional Economic Prospects; Cambridge Econometrics

2.6 These differences in sectoral composition are important determinants of overall economic growth, which is the weighted average of sector growth rates according to the relative importance of each.

4.1 The final column of Table 2 indexes UK sector growth rates to the overall UK average and shows that between 1981 and 1998 Manufacturing in the UK grew at just three-quarters of the UK economy average. Over the same period Financial and Business Services grew more than two times faster than the UK average. Comparison of column two with column three shows the Welsh economy becoming more specialised in exactly those sectors with the slowest growth rates at the UK level.

2.8 It is important to recognise that even aggregation into eight sectors (as in Table 2) masks considerable variation within sectors. The most obvious example is Manufacturing, illustrated in Table 3, which shows the estimated distribution of Manufacturing Gross Value Added in Wales together with estimated growth rates since 1990. Metal Manufacturing remains the most important sub-sector of Manufacturing in Wales in terms of GVA, although Electronics, Electrical and Instrument Engineering is catching up fast. Other fast growth sectors of Welsh manufacturing have been Motor Vehicles, Other Transport Equipment, Plastics and Food, Drink and Tobacco. Declining sectors have included Metals and Minerals, Textiles and Wood Products. Hence structural change occurs within as well as across sectors, for exactly the same reasons outlined earlier. Even the categorisations of Table 3 hide considerable diversity, with, for example, Metal Manufacturing encompassing both Steel and Aluminium outputs.

4.2 The Composition of Welsh Manufacturing

Table 3 Structure of Welsh Manufacturing

Manufacturing Subsector	% of Manuf. GVA 2000	% GVA Growth 1990-2000
<u>Food, Drink & Tobacco</u>	10.8	21.6
Textiles, Clothing & Leather	2.6	-20.3
Wood & Wood Products	1.4	-17.8
Paper, Printing & Publishing	7.1	-3.2
Manufactured Fuels	2.8	16.1
Chemicals & Man-Made Fibres	9.1	3.6
Rubber & Plastic Products	5.5	28.5
Non-Metallic Mineral Products	2.9	-23.1
Basic Metals & Metal Products	20.0	-21.2
Mechanical Engineering	4.4	-5.5
Electronics, Electrical, Inst. Eng.	18.3	75.2
Motor Vehicles	8.1	39.6
Other Transport Equipment	3.5	28.0
Other Manufacturing	3.6	0.5

Source: Regional Economic Prospects; Cambridge Econometrics

4 Sector/Cluster Strategies

3.1 Given that current structures are largely the result of market forces, and that future structures must be determined by current and future sector growth rates, the obvious issue is the extent to which governments (or development agencies) can influence sector growth. The trend towards regional cluster (defined as networks of firms that derive competitive advantage from proximity) strategies reflects a contemporary belief that such strategies can encourage beneficial clusters with important spin-offs in the region. The jury is still out. It is agreed however that successful clusters cannot be invented, and that networks must be industry-led, combining existing expertise with identifiable opportunities.

4.1 Recent analysis for the DTI sought to identify the existence (or absence) of significant clusters in UK regions, including an assessment of the importance of “creative” industries. According to the most recent version of the study Wales had 12 Clusters, Agriculture, Automotive, Biotec, Clothing, Electronics Industrial equipment, Metals, Opto Electronics, Plastics, Tourism, Wood/furniture, and Antique dealing. Analysis of the creative industries suggested that in media Wales had a lower proportion of UK sector employment than her share of the overall workforce, a characteristic shared with every other region but the South East of England.

3.3 In the “weightless” or knowledge-based economy, the ability to foresee and then manage change outweighs previous imperatives (such as least-cost, mass production). Knowledge, or the application of ideas and information, becomes the crucial ingredient in the production mix. Hence the new economy, where companies deal in ideas and creative content, can prosper in locations as expensive as West London. Appealing to such companies on the grounds of marginal cost savings is inappropriate. Such companies require

quality communications infrastructure, an amenable environment in which to work and live and access to highly skilled and motivated people.

3.4 Building a knowledge-based economy is about promoting the application and spread of ideas and information – increasing access to the Internet and Ecommerce, encouraging the development of knowledge industries and enhancing the application of value-adding ideas across the economy. 21st century economic development strategies must be about ideas; about encouraging firms and organisations to exchange ideas and information as well as goods and services (ie to learn from each other), about developing process and market expertise within and between sectors, and about looking for future prosperity from the interaction of proximate firms in learning networks.

3.5 The essence of a cluster strategy is the effective combination of two characteristics – identifiable expertise, derived from existing higher and further education or production experience, and market potential. Seeking to build clusters on one without the other simply will not be effective. For example Wales has considerable experience and expertise in coal extraction, but there is little market potential in a declining sector (although Wales could conceivably capitalise on this experience through consultancy or training for others). Similarly there is considerable market potential in software engineering, but relatively little established expertise in Wales. Developing a software cluster would then be a long-term venture, requiring significant prior investment in skills development.

3.6 One way forward could be to initiate, support and develop a series of cluster groups, each industry-led, at which ideas, experiences and opportunities can be developed. Strategic clusters would be identified to build upon existing strengths and to take maximum advantage of market and technological opportunities in order to add value to commercial activity in Wales. Activities should include cluster-mapping, a strategic review of future markets and technologies and the development of five-year action plans for each cluster.

5 Overall Strategies

4.1A successful economy must be based on globally competitive firms that provide quality jobs in a sustainable way. Whilst looking forward is crucial to a strategy that will develop such an economy, there are obvious dangers in seeking to identify the successful firms, products, technologies or sectors/clusters of the future, since it is markets that will determine success. What can be more reasonably predicted are the kinds of environment (from world-class communications to competitive suppliers), the kinds of organisations (networked, learning, knowledge-based) and the kinds of individuals (outward-looking, skilled, flexible) that are likely to be associated with success.

4.2 This analysis leads to a number of strategic implications. Taken together these form the basis of an integrated long-term strategy for economic development to correct the present imbalances in economic structure in Wales, and hence address a primary cause of the prosperity gap. Such a long term strategy must break the over-dependence on slow growth sectors, building on our existing structures to develop new high growth sectors. The successful clustering of companies in such sectors will be fundamental to raising productivity and therefore prosperity in Wales.

4.3 These strategic implications include the following:

- A renewed emphasis on higher education and its integration into the economic development process including its ability to exploit and commercialise its R&D, particularly through the establishment or extension of centres of expertise.
- A concentration on the establishment and maximum utilisation of world class electronic and physical communications infrastructure such as:
 - Positioning Wales to maximise the potential benefits of future technologies e.g. third generation mobile networks.
 - Developing the physical infrastructure needed to cut time to market to a minimum.

Whilst such an infrastructure is not a sufficient condition for economic development, it is rapidly becoming a necessary one.

- The wholesale internationalisation of all Welsh companies to allow successful firms including SMEs to grow and realise their full potential, defining global standards against which the performance of such firms can be benchmarked.
- The effective establishment or expansion of industry-led cluster networks, within which proximate firms can collaborate locally to compete globally.
- Building on and expanding the scope of existing Supply Chain programmes including Source Wales and the various industry Fora to encompass the supply chain linkages of the new knowledge based economy. These supply chain programmes can lead to significant improvements in both productivity and product innovation.
- The early implementation of the Entrepreneurship Action Plan including the business birth rate strategy to release the entrepreneurial potential of individuals and firms in Wales.
- The attraction and embedding of knowledge-intensive business into Wales.

- The clear demonstration of the commercial advantages to the firm of investing in Research and Development, and the benefits to individuals of investing in their own skills and training.
- A framework for the strategic analysis of the medium to long term future, including market and technological threats and opportunities, and the policy options in responding to these.

4.4 In conclusion the structure of the Welsh economy is of substantial importance to present and future prosperity across Wales. Whilst structures are the product of market forces, and whilst governments are constrained in their potential to influence individual sector development, there are substantial opportunities to create the appropriate environment for the success of both businesses in Wales and our ability to attract new businesses to Wales.

Appendix: Porter's "Diamond"

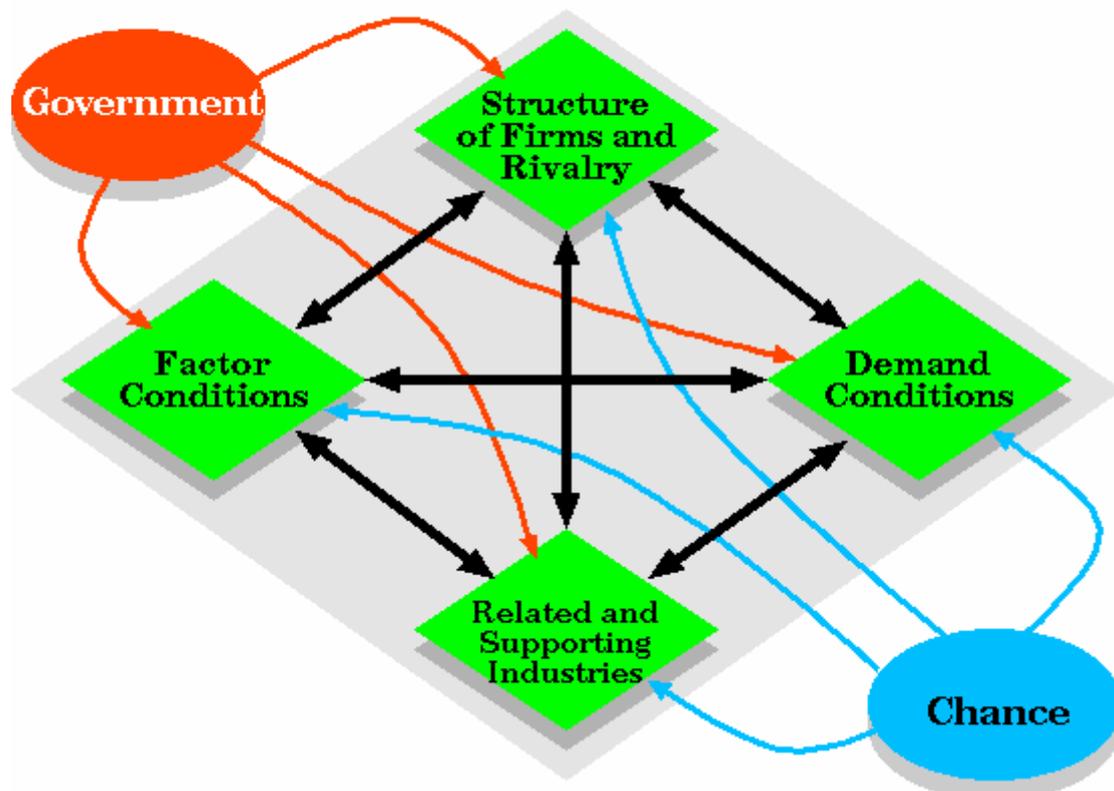
Michael Porter (1990) proposed a model that provides conditions that have to be met for a firm to be internationally competitive and successful. This model focuses on four primary conditions which he arranged in a diamond-shaped diagram (hence the name "Porter's diamond"). These four key elements to international entrepreneurial success are:

- **Factor Conditions**
 - **Factors**
 - **basic**
 - The nation's physical resources (see the section 2.2).
 - Climate and geography
 - Demographics (population growth or decline, population age structure)
 - **advanced** (advanced factors are a product of investment by individuals (e.g., skills), governments (e.g., infrastructure), or firms (e.g., technology).
 - Quantity, skills, and cost of the workforce.
 - The nation's stock of knowledge (technological knowledge, marketing knowledge, managerial knowledge) that affect the quantity and quality of goods and services.
 - The amount and cost of capital resources that are available to finance industry.
 - The type, quality, and user cost of the infrastructure (transportation and communication, health-care system) that affect the quality of life in a country.
- **Factor Importance**
 - Generalised factors: benefit *any* industry
 - Specialised factors: benefit *a particular* industry
- **Factor Origin**
 - Endowed factors (nature etc.)

- Created factors (through investment, also: agglomeration effects)
- **Demand Conditions**
 - Composition of demand.
 - Buyer sophistication.
 - Size and growth of demand.
 - Internationalisation of demand.
- **Related and Supporting Industries** (the importance of clustering)
 - Vertical support: presence of internationally competitive supplier industries (ensuring cost-effective and speedy delivery of components).
 - Horizontal support: presence of internationally competitive related industries to co-ordinate and share activities with and stimulate competition.
- **Structure of Firms and Rivalry**
 - Management ideologies (e.g., German and Japanese firms focus on improving manufacturing process and increasing productivity; often engineers are put into managerial positions).
 - Company Goals
 - Employee motivation
 - Amount of rivalry and competition in the industry. Local rivalry is better than international rivalry, because domestic rivalry tends to be more intense.

Porter's Diamond

Adapted from Michael E. Porter "The Competitive Advantage of Nations"
(New York: Free Press, 1990, p.72)



Porter's theory: *if the elements in the diamond are increasingly present, trade increases.*