

Economic Research Advisory Panel

**ECONOMIC FUTURES
FOR WALES**



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

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ECONOMIC FUTURES FOR WALES

Introduction

1. The Economic Research Advisory Panel has reviewed a range of evidence on:
 - longer run trends facing Wales;
 - more generally, the scope for “futures” research to contribute to the formulation of better economic policies.
2. This paper sets out the Panel’s views on the broad trends likely to face economic policy makers in Wales over the medium to longer term and on what implications can reasonably be drawn from them. It also reflects the Panel’s assessment of the degree of confidence that can be had in the trends in each area, of the limitations of prediction, and on what these limitations themselves imply for the policy making process. (The “medium to longer term” means more than about five years in the future.)
3. Future trends are discussed here mainly in broad, qualitative terms, reflecting the Panel’s view of what is practical. However, the discussion is anchored in solid evidence on trends to date.
4. The paper comprises four sections where the main trends identified in futures literature have been drawn together and considered under “themes” (demography; economy; science and technology; environment); a section reviewing the overall picture and drawing some general conclusions; and an annex examining the lessons for Wales from smaller, successful countries.
5. The Panel additionally reviewed some material from the literature within a theme that might be termed “perceptions, attitudes and governance”. While this is an important area, much of the material was highly speculative, and the links to economics appeared generally fairly tenuous.

Theme 1: Demography

Evidence on demographic changes affecting Wales

- 1.1 Demographic trends in Wales reflect the declining birth rates and increasing life expectancy seen across the developed world.
- 1.2 In broad terms, major trends in Wales include:
 - birth rate well below that needed to maintain the population;
 - increasing life expectancy;
 - these factors acting in combination to produce an ageing population;
 - effects compounded by the significant (but temporary) impact of the ageing of the large cohorts born in the 1940s and 1960s, making the changes seem more dramatic;
 - more in-migration than out-migration, with the net effect outweighing natural population decline, and thereby resulting in overall population growth;
 - such growth taking place in most parts of Wales, except the Valleys, which have very low rates of in-migration;
 - net in-migration rates for retired age groups which are small, both relative to population as a whole and in absolute terms;
 - relatively high rates of in-migration for the older working age groups, who are often accompanied by dependent children;
 - net in-migration of those aged 0-15 offsetting the loss of those aged 16-24;
 - migration resulting in large increases in population (including working age population) in many rural areas;
 - reductions in the numbers of the young driven primarily by the declining birth rate and reductions in the number of women of child-bearing age (not migration);
 - both out-migrants and in-migrants better qualified than average;
 - while the former are even better qualified than the latter, there is no evidence of a major “brain drain”, particularly for recent years, as considerably more have entered than have left¹;
 - over the medium term (10-15) years, no major increase in dependency overall: rising numbers of elderly will be offset by declining numbers of children - and numbers of working age are expected to be broadly stable (partly as a result of increase in retirement age for women).
- 1.3 The decline in birth rates in Wales reflects the position across the UK, Europe (including the “enlargement” countries), and most of the rest of the developed world.
- 1.4 Delays in the age at which women have children may have the effect of temporarily depressing birth rates, resulting in the potential for recuperation of rates over the medium term. However, there is as yet no firm evidence on whether such recuperation will actually occur. Even if it does, there is certainly no indication that any recuperation in Wales will be sufficient to produce a return to birth rates at or above replacement rates.

¹ Although it should be noted that those of working age who enter tend to be older than those who leave.

- 1.5 Whilst the decline in birth rates to below replacement rates is a general phenomenon, there is considerable variation in the patterns - with the contribution of age-specific declines, "postponement" and the potential for offsetting recuperation varying a great deal across countries - even near neighbours.
- 1.6 In consequence, overall birth rates across Western Europe vary, with Greece, Spain and Italy being outliers with very low rates. Although research comparing southern and northern European countries provides some evidence that low unemployment, the availability of part-time and flexible work and the provision of child care can help, this does not alter the basic picture, which holds true even in the Nordic countries (with which Britain is actually not much out of line).
- 1.7 Within the UK, demographic trends across the various countries and regions are broadly similar in respect of declining birth and death rates, with the major differences being driven by variations in migration rates. In Scotland, for example, the absence of net in-migration means that the population is already in decline.
- 1.8 While some of the factors affecting birth and death rates are well understood, there is no robust basis upon which to base long-run estimates - particularly in respect of birth rates.
- 1.9 All this makes prediction difficult. But on the assumption that birth rates do not recover significantly (and evidence from across the developed world makes this seem unlikely) a reasonable central scenario for Wales is set out in the box below.

Probable demographic trends

Birth rates in Wales will remain well below what is required to maintain population. Life expectancy will continue to increase, and there will be a significant overall ageing of the population. The increase in the elderly as a proportion of the population will be broadly in line with that seen in England (albeit from a position in which the elderly account for more of the base population in Wales). The numbers of children and young people could fall significantly, perhaps by 40% over 50 years. The number of people of "working age" will eventually fall gently - but only after an increase as a consequence of the raising of the retirement age for women between 2010 and 2020.

The dependency ratio will increase (though the increase over the short to medium term will be very modest, and both Wales and the UK will probably experience a shallower rise in the number of elderly dependants than many other developed countries). Average household size will continue to decline, with a consequent increase in the number of homes (for a given population size), though the scale of the overall impact will depend upon migration flows (see below).

- 1.10 It also seems likely, but there may be less confidence here, that the elderly will be increasingly healthy and active. There is evidence that health costs are related more to the period before death than to chronological age in itself. This may be less true of care costs, though much depends on the rate of medical advance. Overall, it seems reasonable to suppose that ageing will increase health and care costs by

less than the increase in the numbers of the elderly would suggest. It also seems likely that other factors (such as the nature of the treatments that become available, increasing affluence and relative price effects) could be bigger influences on health and care costs than ageing itself. Furthermore, it is possible that increases in such costs could be offset to some extent by reductions elsewhere - for example as a result of falling school rolls.

- 1.11 There has been some speculation that recent changes in diet and lifestyle may mean that the trend to increasing life expectancy will not persist. There is little hard evidence here, but it is worth noting that work for UK pension providers has recently concluded that there is no sign of a change in the trend, and that in fact their estimates of life expectancy have been revised upwards. Furthermore, although life expectancy in the USA is not amongst the very highest in the world, that country has shared in the general trend to increasing longevity despite a growth in the incidence of obesity. Of course, it is possible that changes to the diet of children may have adverse effects on longevity in the very long term.
- 1.12 The biggest uncertainties probably attach to migration flows. In general terms, the shifts in age-structure described above are fairly robust to modest changes in the assumptions made about birth and death rates. Variations in the assumptions made about migration could have bigger effects. In the absence of net in-migration, if birth rates remain below what is required to maintain population, then population would decline continuously. Over fifty years, the Welsh population could drop by one-fifth.
- 1.13 The determinants of migration are poorly understood, but it is known that inter-regional migrants tend to be better educated than average, and tend to benefit financially from moving (after a lag). It seems reasonably likely, therefore, that the combination of increasing educational standards and global economic integration will tend to increase migration flows, both in and out.
- 1.14 The level of immigration into the UK as a whole is a major potential variable over the next 50 years. But the overwhelming majority of first-generation immigrants to the UK go to the major urban conurbations. The direct impact on Wales of possible varying levels of in-migration to the UK over the next 50 years is therefore likely to be relatively limited, unless deliberately targeted as an act of policy.
- 1.15 There is an extensive academic literature on the economic effects of migration. In principle, migration could be associated with either higher or lower living standards for the indigenous population. In the Welsh context, however, a major reduction in inward migration would be likely to be reflected in absolute population decline in many places. This would be likely to impose significant transitional costs, and perhaps permanent costs if associated with the loss of scale economies (eg in educational provision).

Possible demographic trends

The elderly will be increasingly healthy and active. The number of deaths will fall at around half the rate of the increase in the numbers of elderly. Health and care costs will increase, but this will be driven by a range of factors, not just ageing, and will be similar to the increase seen across the UK and beyond.

Either: Migration flows will increase, but net in-migration (mainly from England) will continue to offset natural population decline, resulting in a total population that is stable or increases slowly. In the upper Valleys, however, population decline will continue. In the rest of Wales, in-migration of those aged 0-15 will offset, but only to a small extent, the decline in the numbers of the young. Migration will result in an additional, but modest, increase in the numbers of the elderly. Development pressures in attractive locations will increase.

Or: Migration flows will increase and out-migration will exceed in-migration. Many areas will experience continuing population decline.

Implications for Wales of demographic trends

Birth rates

- 1.16 There is a general consensus in the literature that there are few if any precedents for government policy making a significant difference to birth rates (although very early indications from Estonia suggest that large financial incentives may have an impact). Furthermore, whilst there is some agreement over the broad factors likely to influence birth rates, their relative importance is not known, and there is therefore little scope for designing evidence-based policies.
- 1.17 The one area where there may be scope for effective action is in the field of childcare and flexible working. There is some evidence that policies in these areas may have contributed to maintaining fertility rates in some of the Scandinavian countries. These countries have not experienced the precipitous decline in rates recently seen in Mediterranean states (and of course, started from a lower base). However, the reasons for the declines in the latter states are unclear, and in at least some of the literature, the phenomenon is related to cultural as much as institutional factors. In any case, fertility rates in Scandinavia are still well below replacement rates, and the consensus seems to be that any policy effects are small at best.
- 1.18 It follows, therefore, that policies in respect of early interventions and the provision of high quality childcare, pursued for other reasons, may have some additional benefits in contributing to maintaining fertility rates. But such policies are unlikely to fundamentally change the broad demographic picture.

Migration

- 1.19 In principle, policies might encompass the following:
 - measures to reduce the rate of out-migration, particularly for target groups such as the young (thus allowing reduced dependency on offsetting in-migration in order to maintain overall population);
 - measures to attract back previous out-migrants;
 - measures to attract other “desirable” in-migrants such as the well qualified, perhaps from countries with large young populations (mainly outside the EU);
 - measures to improve the attractiveness to migrants of areas currently failing to attract them (ie the Valleys).

- 1.20 In some of these areas, of course, policies are already in place in Wales. But it should be noted that, if fertility rates remain well below replacement rates, reduced rates of out-migration (even if they can be achieved) will not deliver a stable population - net in-migration is needed to do this. Furthermore, in the light of the evidence of the association between mobility and education, reductions in the rates of out-migration may be very hard to achieve.
- 1.21 However, there are precedents for changes in in-migration flows. The success of the Irish economy over the last decade has been accompanied by the return of people of Irish origin or descent. And as has been widely reported, Scotland has recently announced steps designed to encourage overseas students to remain in Scotland on graduation. There may be a particular opportunity to create incentives for the best qualified school leavers to attend Welsh universities (though such incentives might need to be quite large). It may also be appropriate to re-examine schemes to attract key workers by offering special arrangements in respect of housing provision.
- 1.22 Whilst one can envisage further policy development in all of these areas, there is little robust evidence on which strategies are likely to work in practice, so careful piloting and evaluation would be crucial.
- 1.23 The fundamental problem is that migration choices are individual decisions made in response to a variety of factors in ways that are poorly understood. Policies are liable to have complex, and perhaps unintended consequences. So for example, action to make urban centres more attractive in order to encourage people to stay might also make them more attractive to in-migrants. Failing to allocate land to meet the housing needs of prospective in-migrants may simply increase demand, thereby pricing out local entrants to the housing market, encouraging them to leave, and so on.
- 1.24 At a fundamental level, however, if fertility rates remain at or below current levels, Wales faces a choice between policies aimed at maintaining population through net in-migration and policies that implicitly accept population decline. If the choice is made in the former direction, this will mean catering, at least to some extent, to the preferences of prospective in-migrants over where to locate housing and the nature of housing provision.
- 1.25 There are clear tensions between policies to facilitate migration and the objective of maintaining and promoting Welsh language and culture. It might, however, be possible to develop novel policies which ease this tension, for example by encouraging in-migration of the young and well qualified, particularly from outside the EU, in combination with incentives for them to learn Welsh.

Working life

- 1.26 The increase in numbers of the elderly will be associated with a gradual decrease in the proportion of population at what is currently regarded as “working age”. However, the numbers of those of working age will not decline significantly until the latter part of the period, after 2020.

- 1.27 Furthermore, as healthy life expectancy increases, many people may wish to engage in economic activity for longer. It will therefore be important to remove artificial impediments to employment. This may involve options such as providing greater flexibility over retirement ages and working hours, and perhaps increasing the opportunities for older workers to be employed in non-traditional capacities (eg “downshifting”). It will be necessary to acknowledge the reality that, for those nearing the end of their careers, investment in training is often harder to justify economically (both for employers and employees). Legal obligations in this area may have perverse results (eg by making employers less keen to employ older workers).
- 1.28 As a major employer, the public sector is well placed to take a lead in making the changes needed to encourage longer and more flexible patterns of work (and such changes should be facilitated by the increasing use of ICT within the public sector). Some of these steps might require changes in law or policy at UK and European levels. Since the demographic changes facing Wales are similar to those facing much of the rest of the developed world, it is reasonable to expect that there will be common pressure for such changes to be made.
- 1.29 It is sometimes argued that the overall impact of an ageing population, particularly as result of the reduced inflow of young people, will be a reduction in the potential for economic growth, since new entrants often bring with them new and increased skills, and productivity falls with age. The evidence here is mixed. Education levels overall do seem to have increased over time, particularly in respect of the number of graduates. But there is also evidence of little improvement in standards of literacy and numeracy at the bottom of the skills distribution.
- 1.30 Furthermore, economic research suggests that lifetime earnings can follow a variety of trajectories. One relatively common pattern is the inverted “U” shape, consistent with a picture in which human capital increases over the first half of a person’s working life (through a combination of education and experience) before depreciating towards retirement. In a context in which the underlying trend was towards longer working lives as result of increasing (healthy) lifespans, there seems no reason in principle why this “U” shape should not be elongated to a modest degree as people choose to work longer. And other trajectories, including one showing a steady increase in earnings towards retirement, are also common.

Managing costs

- 1.31 As noted above, the growth in the numbers of old people might be expected to be associated with an increase in costs, particularly those met by the public sector. However, there are also grounds for thinking that other factors that are also tending to drive these costs up may be more important. And there is certainly a view in some of the literature that increasing affluence creates opportunities for individuals to meet more of these costs themselves. Incomes of pensioners have been increasing much more quickly than the average over recent years. After allowing for housing costs, only 16% of pensioners in Wales now live in households below 60% of median income, compared to 20% for working age people in Wales and 21% for pensioners in the GB as a whole.

- 1.32 The Assembly's funding mechanism means that it will have to live with the consequences of any decisions taken in England on the appropriate balance between individual and state funding.

Key implications for Wales of demographic trends

There is little reason to suppose that policies to increase fertility would prove effective, though policies in related areas, for instance childcare, pursued for other reasons may have minor beneficial side-effects on fertility.

Policies will therefore have to address the need to manage either population decline or migration flows. Increasing economic integration and better education mean that migration flows (both in and out) are likely to increase. Whilst policies to reduce out-flows may have some effect in reducing flows below what they otherwise would have been, if the objective is to maintain overall population levels, policies will need at least to facilitate and perhaps actively encourage in-migration. The economic case is strongest for in-migration policies focused on the better skilled.

There may be tensions between cultural and other social and economic objectives, particularly as in-migrants will wish to choose where they live.

The effects of policies on migration are likely to be complex, with a risk of unintended effects. For example, policies to make places more attractive (even if successful) may encourage more people to come in, rather than existing residents to remain.

Policies should seek to facilitate longer working lives, and remove artificial impediments to the economic participation of older people, but provided this is done, there seems no reason in principle why the appropriate adjustments should not follow naturally.

Theme 2: Economy

Evidence on economic trends facing Wales

Growth and sectoral composition

- 2.1 Developed economies have generally experienced a long run rate of economic growth in of around 2 to 2½ percent per year (perhaps a little less on a per capita basis)². The reasons for both the rate of increase and its relative stability are not fully understood, but there is a consensus that key factors underpinning economic growth include improving education, greater use of capital, and the growth of knowledge. There is no indication that this long run rate of growth will decline in the foreseeable future.
- 2.2 At this long run rate of growth, Wales would achieve levels of GDP per head that equate with the current figures for the UK in around 8 years, and with those in London and the south east in perhaps a further 8 years. Of course, success in policies to improve Welsh economic performance would accelerate this catch-up.
- 2.3 In common with the rest of the UK (and indeed the rest of the developed world), the structure of employment in Wales shows a long run trend away from manufacturing and towards services, with the former now accounting for around 16% of employment in Wales³. This figure is similar to that seen in several “northern” English regions, and does not look untypical of rates seen in many other parts of the developed world. (And of course, such decline should not be seen as “failure” - productivity improvement necessarily reduces the quantity of inputs required to produce a given quantity of output.) The recent strong performance of the Welsh labour market shows how the economy has adjusted to the steady decline in manufacturing employment by generating increased employment opportunities in other sectors, and as explained below, has not been associated over the last decade with general de-skilling.
- 2.4 Wales is rather unusual however, in having a low proportion of higher quality jobs in business and financial services. This is a proximate cause of Wales’s relatively poor overall economic performance, and may reflect the lack of a really large city (of the scale of Leeds, Manchester or Birmingham).
- 2.5 Within manufacturing, the largest trend declines have been in basic/fabricated metals and textiles/clothing. The largest increases have been seen in the preparation of food products and beverages⁴ (though electronics did expand significantly before the world-wide downturn in electronics and ICT post 2000).
- 2.6 In terms of size-structure, it appears that the UK-wide trend towards smaller businesses observed in the 1980s was arrested, and perhaps even reversed in the 1990s. This appears to have been driven by consolidation in the services sector, rather than by any major changes in manufacturing. (And it is worth noting that,

² An exploration of the potential for very much more rapid growth is contained in the Annex.

³ Of course, this is not true (at least to the same extent) in respect of output, since (measured) labour productivity growth has generally been higher in manufacturing than in services

⁴ Note this is not typically the local processing of Welsh agricultural products, and includes such activities as the large-scale manufacture of breakfast cereals and the preparation of ready meals.

once allowance is made for employment in businesses owned outside its boundaries, Wales is almost as dependent on large businesses as is the UK as whole – and within manufacturing, it is more dependent.)

Occupational structure

- 2.7 There is evidence that over the period since 1990, at least, there has been on average a shift towards better paid jobs and that the overall pattern seems to have been broadly similar in Wales and the UK as a whole.
- 2.8 In parallel, Wales has shared in the general expansion of graduates in the workforce. In broad terms Wales's performance is similar to that of a range of "northern" English regions⁵. It is also notable that the expansion in the number of graduates has not so far been associated with a significant or lasting decrease in the average earnings premium associated with having a degree.
- 2.9 The patterns set out here in respect of both job quality and graduate employment are consistent with a general trend towards jobs which are on average more highly skilled (or "knowledge-intensive"). Despite the increase in the supply of highly qualified people, the return to high qualifications has been stable or even risen, except perhaps for the most recent cohorts. This is a trend observed across developed countries, and has generally been seen as a consequence of some combination of "skill-biased technical change" and increased trade with lower-skilled countries - with many researchers tending to emphasise the contribution of the former factor (though direct evidence is limited).
- 2.10 However this general trend towards more highly skilled and knowledge-intensive employment has also been associated with a "hollowing out" of the jobs distribution. This hollowing out has been attributed to the nature of the technical change that has occurred in recent decades. This has seen machines (including ICT) replacing more readily "automate-able" jobs, which have often been located towards the middle of the quality distribution. The result has been an increase in proportion of less readily automate-able jobs, mainly at the top end, but also towards the bottom (including for example retail and personal services). This pattern has been reinforced by the increasing demand for services associated with rising levels of affluence.
- 2.11 There is also evidence that a very large part of the variation in incomes between areas and regions is driven by differences in skills and other personal attributes, and that if anything, such factors are becoming more important in explaining spatial variations over time. This suggests a possible trade-off between policies designed to foster the success of people and of places. If one were concerned exclusively with the prospects for Welsh people, one might restrict policies to those delivering enhancements to human capital. If one wished, however, to maximise economic activity taking place in Wales (and retain people in the country) one might adopt a different policy mix. However, this tension may be less acute in practice than in theory - there is evidence that skills are themselves an important determinant of the location of economic activity, in addition to their role in improving individuals' life chances.

⁵ Note that if the comparison had added to graduates those with higher education qualifications below degree level, Wales would lie in the upper half of the distribution of regions over most of the period.

- 2.12 There seems no reason to suppose that the broad trends set out above will be reversed, although it is likely that an erosion of the internationally high returns to degrees will set in at some point⁶. Overall, it seems likely that skills will be of increasing importance. However, as a recent report from London Economics for the Welsh Assembly Government showed, forecasting specific skills needs poses particular problems both because it is very difficult to predict accurately future employment and occupational structures and because the skills required in individual occupations change. The latter factor seems to create an especially challenging obstacle. There is, however, convincing evidence of the importance of good basic skills, both for individuals' employment prospects, and for wider measures of economic performance.
- 2.13 Over the long term, there is evidence that the most cost effective way of upgrading skills is through interventions very early in a child's life - typically pre-school. To be effective, such interventions need to be both intensive and targeted at the most disadvantaged children.

Trade, EU enlargement and globalisation

- 2.14 Although many researchers have suggested that changes in the skill composition of employment have been largely driven by skill-biased technological change rather than trade, the increasing integration of the economy at regional, state, European and world levels has had other important effects.
- 2.15 Research on the impact of EU enlargement has indicated that whilst one effect might be to reinforce the trends identified above (particularly the decline in low-skilled jobs in mass-production manufacturing), neither in nature nor in scale does enlargement represent a step-change in the economic circumstances facing Wales. Previous expansions of the EU (particularly the entry of Spain and Greece in the 1980s) provide quite close parallels, and the existence of (currently) lower-cost locations offering potential alternative production sites is nothing new.
- 2.16 In particular, EU enlargement does not signal the end of the supply of lower skilled jobs, particularly in less mobile services - as noted above, this is an area of the market that is likely to expand with increasing affluence. Indeed, increasing demand for services of this kind may eventually result in improvements in relative remuneration within the sector, not just an increase in the number of jobs.
- 2.17 Evidence suggests that over recent years, while there has been economic convergence at the level of states in the EU, there is little sign of convergence at regional level (despite the implementation of policies intended to achieve greater "cohesion"). There has also been some suggestion that regional income differentials are increasingly reflecting divergences in skill levels.
- 2.18 There is some evidence of a slow but persistent trend to specialisation within Europe, with an associated increase in inter-regional trade flows. There is also some evidence of the centralisation of headquarters and research and development functions in the core (and in some major cities outside the core).

⁶ Recent evidence suggests that this may have started to happen. But there is no sign that degrees will cease to be, on average, financially worthwhile.

Probable economic trends

Skills (at all levels) will become increasingly important, with the greatest returns to those higher level skills that are most difficult to automate. At the same time, increasing affluence and the ageing of the population will drive an increase in demand for non-mobile personal and retail services, so the hollowing out of the jobs distribution will continue, though the relative decline in returns to those working in personal services may stop or even reverse. Good basic standards of literacy and numeracy will be essential for all, as will a high level of generic and interpersonal skills.

Fewer and fewer will work in manufacturing industries (and agriculture), and “high tech” sectors will continue to account for only a very small proportion of jobs. Information technology, biotechnology and nanotechnology will play an increasing role, as will the convergence of different technologies, but the major economic gains (and jobs) will come from the use of new technologies, not their production, and from the associated processes of industrial restructuring. It is very difficult to predict what form such restructuring will take.

In Wales and across the UK there will be major increases in demand for, and the costs of, services which have traditionally been provided by the public sector and paid for out of taxation - health, education, and social care.

Increasing affluence will also drive big increases in demand for “quality” services, including those of a (broadly) cultural variety.

Continuing specialisation will result in increasing trade flows and more open regional economies. But this “globalisation” in the provision of goods and tradable services will be balanced by increased local spending on non-mobile services.

Promising sectors

- 2.19 The WDA and most of the RDAs in England have undertaken exercises to identify promising sectors or potential clusters (although much of the evidence casts doubt on the scope for the public sector to create completely new clusters).
- 2.20 Work of this kind is probably needed to guide shorter-term resource allocation by the public sector. However, a number of experts have expressed reservations about the risks of pushing the approach too far. Kate Barker (a member of the Bank of England’s Monetary Policy Committee) has recently commented⁷:

"The risk is that any prediction about the right sector will be remembered for longer than the sector itself remains strong. It is not so much sectors as characteristics that build advantage. For example in the UK these might include design expertise and the English language. Call centre jobs are only the most widespread example of activities which have come here, and then started to depart, over the past decade.

⁷ <http://www.bankofengland.co.uk/speeches/speech206.pdf>

But it is surely true that the UK will be relatively efficient, compared to other EU countries, or to China and India, in a large number of product areas.

"The power of the theory [of comparative advantage] is that we don't have to know what exactly the goods and services are, in which we will specialise successfully in the future, although there maybe some benefit from policies which seek to build on the advantages which exist today. One possible indication that of where this might be at present is suggested by the recent improvement in the UK's relative export prices for services..... It seems unlikely that in the 1880s, or for that matter the 1920s or 1950s, the UK's sources of comparative advantage were known at the time, or that the future sectors could have been accurately predicted. Yet despite concerns over the loss or diminution of industries ranging from corn to steel to cars to financial services, the long-term trend is that we have become wealthier, more productive and (at least recently) more employed. Trade has contributed to this - by giving consumers access to cheaper goods and services."

Location of net job creation

- 2.21 Over the longer term, the areas in Wales with the biggest proportionate gains in the number of jobs have included the more rural unitary authorities. But the coastal belt in south and the north-east have also gained. The biggest losers have been the Valleys.
- 2.22 The explanation of this pattern is not clear - it probably reflects some combination of:
- the increasing importance of quality of life factors in location decisions (a key factor behind the phenomenon of counter-urbanisation affecting much of the UK over recent decades);
 - the greater role played by the largest conurbations;
 - the spatial implications of the trend towards the increasing importance of skills (affecting the Valleys in particular).
- 2.23 Some of the literature even suggests that micro climate can play a role in the longer-term fortunes of particular areas.
- 2.24 The particular challenge posed by the Valleys is to develop a new economic rationale for economic activity in that location.
- 2.25 At a smaller geographical scale, there is some evidence that increasing affluence is associated with greater social segregation, reflecting the preferences of the affluent themselves. However, there is also evidence of changes in the social composition of the southern Valleys as these increasingly function as part of the wider agglomeration in south-east Wales.

Possible economic trends

Perceived quality of life may become an increasingly important factor in business location decisions, continuing to favour attractive rural locations and vibrant cities. Cardiff could either move into the top tier of UK regional capitals, or play a secondary role to Bristol. The upper Valleys, in particular, could continue to lose out, though there may be scope to capitalise on the high quality landscape. The economic performance of north east Wales is likely to continue to be linked to that of the north west of England. Rural areas are likely to experience divergent performance, depending on a range of factors including perceived attractiveness and critical mass.

Whilst it may be possible to identify particular sectors as having growth potential, particularly over the shorter term, a measure of caution is needed as success will be determined by economic factors and technological change in competing technologies which are both difficult to predict.

Increasing affluence and leisure may result in very high returns being possible in these sectors, especially where some unique selling point exists or can be created.

Increasing integration at the European level may result in the continuing marginalisation of peripheral areas, and Wales could suffer as a consequence.

Implications for Wales of economic trends

Education and skills

- 2.26 Skills are playing an increasingly important role in economic development. There is no indication that this trend will change. In view of the uncertainties over future skill needs, it is ever more important to ensure that those entering the labour market have a flexible portfolio of skills over the full range of levels sought by employers.
- 2.27 It will be particularly important to ensure that everyone leaving school has a good basic standard of literacy and numeracy. Many of those who are not destined for the more highly paid end of the labour market will require a skill set appropriate to success in the service sector.
- 2.28 Evidence that the returns to degrees have been maintained, at least until recently, gives some confidence that expansion of the higher education sector could produce further economic benefits. However, the variation in returns across subjects suggests, at least, that there may be role for better provision of information to people at the point of selecting subjects to study.

Sectors and clusters

- 2.29 In designing policies over the short to medium term it may be necessary to take a view about the relative prospects for different sectors. But the evidence is that the fortunes of sectors, and clusters, are difficult to predict, as outcomes reflect a range of complex circumstances. There is also a danger of getting “locked in” to policies that support sectors that are seen as “desirable” but which turn out to have little real prospect of growth (or which are actually in decline). Any views about the long term prospects for sectors and clusters must remain tentative, and policies need to reflect this reality.

Exploiting “uniqueness”

- 2.30 In a world of increasing affluence, integration and mobility, there may be increasing prospects of capitalising on features which are perceived as attractive and which are specific to particular locations. There is certainly some evidence that individuals within businesses who make key location decisions can be influenced by quality of life factors. It should of course be noted that people may differ in what they perceive as constituting a high quality of life. Recent research indicates that for young professional families, modern housing adjacent to a motorway intersection is highly desirable, and that innovative and entrepreneurial young people are attracted to vibrant urban centres with a major higher education presence.
- 2.31 Even people who do not wish to fully re-locate to a region may wish to retain links with particular places, and this may provide opportunities for those seeking to build strategic alliances or attract inward investors.
- 2.32 Any approach which seeks to strengthen or exploit specific features of Wales needs to be realistic, and based on evidence of what really is perceived as attractive by key individuals. There may be a danger of wishful thinking in this area.

Cities and agglomeration economies

- 2.33 There is evidence that, after skills, the next most important factor in shaping economic performance is the presence of agglomeration economies, particularly those associated with major cities.
- 2.34 One of the ways this works is because sheer size allows some activities to flourish which in smaller places cannot survive because they need minimum numbers. These include a variety of “cultural” pursuits and lifestyles.
- 2.35 Despite the benefits associated with its status as a national capital, Cardiff remains a comparatively small city. One of the problems may be that, socially, “greater Cardiff” is not diverse enough and that, perhaps, topography limits interactions. There may be scope, in the context of work being done on the spatial plan, for investigating how the wider south-east Wales economic region could gain the benefits of the agglomeration economies that should be associated with a population of over one million people.

Rural Wales

- 2.36 As noted above, across Wales and the rest of the UK, there is broad evidence of strong jobs growth in many more rural areas. This has been associated with net in-migration, and reflects the range of factors noted above. Again, there is no reason to think that the forces that have resulted in this trend will abate. This gives rise to some difficult choices, whether or not the desired population movements are accommodated. If a policy of accommodation were followed, one might see rapid population growth in some places, and major social and cultural change (and, of course, environmental effects). If there is less accommodation, the desired movements are likely to result in large increases in house prices as more people compete for a restricted stock.

Key implications for Wales of economic trends

The importance of skills will continue to increase - this is likely to be the crucial factor in economic success. Basic skills, especially literacy, numeracy and interpersonal skills will be vital at the lower end of the skills distribution, and graduate levels skills at the higher end.

Beyond this, it is not practical to forecast in detail skills requirements over the medium to longer term. What is important is that people's skills are "robust" - ie valuable across a range of outcomes.

The dominance of services as a source of employment will be reinforced, and this will require a review of the effectiveness of economic development policy instruments.

It is not possible to forecast future performance of individual sectors over the medium to longer term - policy needs to be flexible, and delivery organisations nimble and responsive. Getting out of losers may be more important than trying to pick winners. The best approach will be one in which opportunities are quickly identified, interventions tested, and either rapidly rolled-out or dropped.

Quality of life will be increasingly important as a determinant of business location, and it will be important to understand what aspects of quality of life matter to key decision makers.

Theme 3: Science and technology

Evidence on trends in science and technology relevant to Wales

3.1 Key - and familiar - trends identified in the literature include:

- further development of IT/communications technology and even greater sophistication of computers and their greater use across sectors;
- increasing use of biotechnology (including genetic engineering), particularly in medicine and perhaps in the development of raw materials;
- increasing use of nano-technology and miniaturised technologies;
- increasing access to IT and communications technology with perhaps the creation of a 'digital divide' as information access is restricted to those who can afford it;
- increasing use of ICT that could encourage the dispersal of some economic activities - but conversely that could also promote the aggregation of others, with higher value activities centralising at key centres;
- technological developments that progressively reduce the costs of reducing negative environmental impacts;
- pharmaceutical developments that increasingly promote longer and healthier life-spans.

3.2 A specific attempt to identify promising technologies relevant to the situation in Wales has been undertaken as part of the WDA's Future Technologies Programme.

3.3 The importance of science and technology to innovation and thereby to economic growth is obvious, widely acknowledged, and a particular focus of contemporary attention. However, the role played by science and technology in the growth process is also complex, multi-faceted, and interrelated with a range of other social and economic factors. The Panel has not therefore sought to examine individual technologies or review in detail particular opportunities, but rather to consider the wider implications of technical change from an economic perspective.

3.4 Despite the hype, there is little evidence that the pace of technological change is faster than, or different in nature from, that seen in the past.

3.5 Most fundamentally, new ideas are only valuable if they meet a market need. For this reason, much economically valuable innovation is small scale, incremental and "intra-mural" - carried out within large corporations. It is also the reason why the international evidence tends to support the view that high levels of competition, low barriers to entry and well functioning regulation promote innovation.

3.6 Even where innovation is not intramural, initial invention, and even the early exploitation of new ideas, generally creates few jobs (or returns which are more than quantitatively modest). New ideas diffuse rapidly, and are often exploited in radically different ways from what was originally envisaged, so benefits may be generated at locations remote from the point of origin (though where tacit knowledge is important, there are greater barriers to such geographical dispersal). Silicon Valley is the exception, not the rule.

- 3.7 Crucially, new products and processes interact with each other and depend for their exploitation on wider market conditions. In combination, the result can be a process of progressive industrial restructuring and relocation that is highly case-specific and difficult to predict. For example, the boom in low cost airlines seems to have resulted from the combination of the use of ICT and the web, progressive improvements in aircraft reliability, the ability to exploit deregulated labour markets, and increasing consumer affluence. In turn, low cost airlines are changing the relative fortunes of airports, and perhaps eventually, of cities.
- 3.8 Evidence from the US over recent years suggest that the bulk of the productivity gains from ICT have been realised through the way in it has facilitated restructuring in ICT-using service industries (for example e-business, data warehousing and data-mining for marketing and other similar purposes).

Probable trends in science and technology

There will be continuing incremental product and process innovation across all sectors, which may in aggregate have more of an impact than changes linked to specific new technologies. However, there will be increasing use of ICT, biotechnology and nano-technology, associated with a range of new products and processes whose nature is difficult to predict. The “narrow” effects of innovation are likely to be dominated by the wider impact of economic restructuring, with particular growth found in businesses that find novel uses for new technologies. Such businesses will increasingly be in the services sector.

Implications for Wales of trends in science and technology

- 3.9 While there is clearly an important role for government in funding and facilitating the development of basic science and technology, and there may be significant local benefits arising from this, the argument above suggests that such benefits need to be kept in proportion. The major benefits from investment in science and technology are likely to accrue to the economy in ways that are hard to predict and remote from the original spending. Applying new ideas, especially in services, may be more important than trying to create new products.
- 3.10 To put it another way, while broad trends in science and technology may be plausibly predicted, it is much harder to predict what this will mean for business structures, and for what activities will turn out to be profitable in which locations. This will depend on a very wide range of social and economic factors.
- 3.11 This all also suggests that there is limited scope for governments to devise policies to exploit longer run trends in science or technology. However, there may be an important roles in promoting the flow of information about new developments; in assisting firms with near to market innovations; in brokering contacts between higher education and business in order to help businesses solve particular problems; and perhaps in “unblocking” the adoption of new technologies where this requires co-ordination across a range of agents.

- 3.12 Perhaps the most important lesson is to reinforce the need for flexibility and responsiveness in policy making. In particular, it will be important to ensure that people are equipped for a labour market in which the overall demand for skills is increasing but where people will need be able adapt their skills to new circumstances as economic restructuring proceeds.

Key implications for Wales of environmental trends

Many jobs will be created by technology-using service sector businesses, and a focus on high-value physical products is liable to be off target. People entering the labour market need skills that are flexible and useful across a range of (changing) occupations, in order to help them cope with economic restructuring.

It is extremely difficult to predict which firms or sectors will be winners in the complex and multi-faceted process of industrial restructuring. Government interventions aimed at promoting economic development should focus on near-market products and avoid long-term commitments to particular technologies.

For a small regional economy, policies to promote the diffusion of technologies and the absorption of new ideas are likely to be more beneficial than an attempt to be at cutting edge, unless there are examples where research is really at the top international level. Assessments of research quality and potential can be prone to wishful thinking, and it is vital that decisions are based in realism.

Theme 4: Environment

Evidence on environmental trends relevant to Wales

4.1 Trends identified in the literature include:

- fossil fuels:
 - decreased reliance on fossil fuels for electricity generation (after a temporary increase in the use of natural gas);
 - increased development and usage of sustainable energy sources where economically viable;
- increasing value placed on aspects of the environment (particularly landscape);
- increased need for, and availability of, 'cleaner' forms of transport;
- divergent views have been expressed on the pace of development, and the nature of, technological "fixes";
- rising in global sea levels (but note dissenting views);
- increasing incidence of more extreme weather (but note dissenting views).

4.2 The Welsh Assembly Government publishes indicators of Sustainable Development, which includes an emerging picture of some key environmental trends in Wales⁸.

4.3 There has been an estimated increase of 6 per cent in the emissions in the basket of greenhouse gases from Wales between 1990 and 2000, whereas in the UK as whole there was an estimated decrease of 13 per cent over the same period. Greenhouse gas emissions in Wales seem set to continue over the short to medium term, partly as a result of increasing use of private transport.

4.4 Major sources of the emission of greenhouse gases include power generation and transport. In the former case, emissions are sensitive to the mix of generation methods. And in both cases, technological change makes difficult the assessment both of the costs of long-term emission reduction and therefore of the likely out-turn trend (which is of course also policy-sensitive).

4.5 Wales' industrial legacy has left it with a mix of industries that is relatively "dirty". However, much of the output of these industries is consumed outside Wales. The "footprint" associated with Welsh consumption is arguably a better indicator of the environmental pressure imposed by Welsh residents than is the footprint associated with Welsh production.

4.6 As in the rest of the UK, there are broadly positive trends in respect of:

- measures of air quality;
- wildlife as proxied by the population of wild birds;
- the proportion of domestic waste recycled;
- river water quality (although with a dip in the more recent past).

⁸ The relevant statistical bulletin is available at:

<http://www.wales.gov.uk/keypubstatisticsforwales/content/publication/sustainable/2003/sb27-2003/sb27-2003.pdf>

- 4.7 There are two kinds of way in which environmental trends could affect the context for economic policy making in Wales. First, environmental changes could have direct effects. The most obvious example is global warming. The problem is that both the pace and the nature of the effects here are uncertain. Prediction in this area is a specialist matter, and Panel did not feel that it would be productive for them to seek to explore the field.
- 4.8 The second way in which environmental trends could impact is indirectly, particularly through the consequences of policies adopted at Welsh, UK or European level in order to address environmental concerns. One of the most obvious examples here might be the growth in wind farms across Wales over the last decade.
- 4.9 It seems certain that policies adopted to counter global warming will encourage the adoption of “greener” technologies. It may also appear that in some respects (particularly wind and tides) Wales has natural advantages. However, these advantages relate to the potential use of particular technologies, not their development or manufacture. In the latter respect, the problem is again one of identifying technologies where manufacture will turn out to be worthwhile in Wales. This is particularly difficult in a field in which technologies are developing rapidly and at differing rates. For example, it is unclear how far wind power will maintain its current position as the most viable source of renewable energy.
- 4.10 From an economic perspective, the consensus recommendation would probably be to use economic instruments in order to allow the market to determine the optimal technological solution. It is intrinsically difficult to second guess what this solution might turn out to be. The pre-selection of technologies for favourable treatment is likely to lead to an inferior outcome, and the process is liable to “capture” by producer-side interest groups who (perfectly reasonably) wish to further the interests of their own businesses.
- 4.11 It is sometimes argued that the costs associated with global warming are so great that in order to satisfactorily address them it would be necessary to restrain economic growth to very low rates. Much of the evidence does not support such a position. Research carried out for the Cabinet Office’s Strategy Unit suggested that a policy designed to use economic instruments to achieve a very low carbon economy over the long term would indeed impose costs measured in trillions of pounds. But the implied reduction in the rate of economic growth would be modest, perhaps implying annual growth of 2% rather than 2.2% over the long run.
- 4.12 The most obvious effects might be felt in respect of transport, but even here there are grounds for thinking that over the long-term technological developments such as biofuels and fuel cells may provide viable solutions. Again, it is difficult to draw any firm conclusions about the prospects for particular sectors in Wales.

Environmental trends

Policies to address environmental costs are likely to result in significant and continuing structural change but, particularly because of the interaction with technological development, it is very difficult to predict either what the changes will be or at what pace they will take place. In general terms, there will be a much bigger role for green technologies, but it is not possible to predict reliably which technologies will turn out to be viable in particular locations - in respect of either manufacture or use.

Increasing value will be attached to the aesthetic qualities of the environment, and there will be even greater pressure to protect attractive landscapes. This will conflict with the desire of people to live in and near attractive places, and perhaps, with the desire to encourage in-migration to counter natural population decline.

Implications for Wales of environmental trends

The difficulty of predicting the most cost-effective methods for delivering long-run environmental benefits, particularly in the context of technological change, means that policies are likely to most effective if they are directed at ends rather means.

Whilst there is a role for early-stage funding for new technologies, in general it would be unwise to make longer-term commitments to particular solutions or specific technologies. However, there may again be scope for action to support near-to-market to opportunities.

General conclusions

1. Several broad conclusions emerge from the analysis presented above.
2. First is the sheer difficulty of prediction over anything other than the very short term, particularly where the “known unknowns” may matter less than the “unknown unknowns”. Although various techniques exist which purport to aid the process of longer run forecasting, none of them seem to have an established track record or to merit significant investment. A variety of plausible scenarios can be generated for the economic future (see box), but there is no robust method for assessing their relative probability.

Some illustrative scenarios for the medium to long term future

- Continuation of present trends, as set out in the sections above. Population is maintained by net in-migration. Skill biased technical change continues to support skills premia and promotes further “hollowing out” of the skills distribution. Increasing numbers are also employed in personal and retail services but at low wages.
- Rapid increases in productivity and affluence raise the demand for personal services to the extent that there are significant wage increases in incomes the sector. Plumbers, hairdressers and “style gurus” become high paying and prestigious professions.
- The long-run tendency for the best jobs to be located in the greater south-east of England resumes and intensifies, resulting in a reversal of current migration trends, and steady out-migration from Wales, particularly of the best qualified.
- Increasing congestion in the greater south-east of England leads to activities being pushed outwards. This is reinforced by ICT which increasingly mimics face-to-face interactions. This leads to convergence in economic performance across the UK, and positive outcomes in Wales.
- The recent tendency towards residential development in inner city areas (particularly Cardiff) turns out to be a “blip”, and counter-urbanisation is reinforced.

3. Second, much change is small-scale, incremental, dispersed and cumulative. Yet attention is naturally drawn to events which are large scale and discrete. Thus the closure (or opening) of a large plant attracts much attention and debate whilst ongoing churn in the economy, whereby at least 1,000, and probably nearer 2,000, jobs are lost in Wales each week (and a similar number are of course created), is largely ignored. Similarly a new product attracts much attention where incremental improvements to an existing product or process are often invisible.
4. Third, in the light of these points, economic policies need to focus on creating an economic context likely to encourage economic growth and promoting investments which will provide benefits that are robust across a range of possible futures / scenarios. It may seem obvious, but in the light of current trends, this means the highest priority must be attached to ensuring that education and training is effective

in delivering the skills needed for people to get and keep jobs that pay decent wages.

5. For those at the lower end of the spectrum, this generally implies good literacy and numeracy skills, and a broader set of attributes appropriate to employment in the service sector - good interpersonal skills, capacity for team-working, and so on. There is sound evidence that intensive early (pre-school) interventions can be effective in raising the educational performance of disadvantaged groups - something that becomes much harder with age. Towards the upper end of the spectrum, there is no indication of any tailing off in the increase in demand for those with graduate skills. In all cases, education needs to equip people with the flexibility to move between jobs and meet a variety of demands.
6. Fourth, government and its agencies need to be flexible, nimble and responsive. In respect of the longer run future, there is an ever-present danger of wishful thinking - of envisaging a desirable future, and simply assuming that it can be delivered. But socio-economic trends are often unclear, the drivers even less well understood, and the effectiveness of many policy levers uncertain.
7. Nevertheless, over the short to medium term there is the scope for governments to exploit emerging trends and gain “first mover” advantage. Some examples, included purely for illustration, are shown in the box below.

Illustration of possible emerging opportunities

- Promote inward migration from target groups - eg highly qualified people from the far east - and encourage them to participate in Welsh culture.
- Encourage foreign students in areas with expected high externalities - eg electronics engineering, material science - to stay on in Wales (the approach currently being proposed in Scotland).
- Take steps to encourage the best-qualified school leavers to attend Welsh universities.
- Make a concerted effort to achieve a step change in the capabilities of the Welsh population in maths and logic (at all levels), thereby achieving a comparative advantage over the rest of Britain.
- Be alert to the opportunity to exploit Wales’s natural endowment for “green” energy sources - identifying the right point to commit to particular technologies is key.
- Transform and upgrade the image of Welsh tourism through acquiring a reputation for outstanding cooking, for example by establishing a national academy of cuisine, importing skilled chefs, and creating “nouveau Welsh” cuisine.
- Establish an international academy of public administration, with world class teaching, to create a highly motivated class of public servants, and provide an “export” service to emerging economies.

8. The scope for identifying and exploiting such opportunities depends upon the existence of flexible and responsive government institutions. There may be a case for further research to examine systematically across regions and nations the comparative advantages of different institutional arrangements.

Wider implications

Prediction is difficult, perhaps impossible, and long-term economic development policies need to focus on delivering outcomes that are robust across a range of possible futures. Current trends strongly support the highest priority being given to education and skills development. Promoting good basic and interpersonal skills amongst the most disadvantaged groups is a high priority, and there is evidence that intensive early (pre-school) interventions can be effective in this area. At the higher skill end, there is little sign of a significant tailing-off in the demand for graduates (although there seems to have been some reduction in returns to the most recent cohorts). It will be important to take steps to ensure that Wales is seen as a place where highly skilled people want to live, and thereby to both retain and attract such people.

Despite the difficulties of prediction, over the short-to-medium term governments can identify and exploit emerging opportunities. In order to do so, government institutions need to be agile, flexible and responsive. The design of government institutions therefore needs to be kept under review.

Annex:

Successful smaller countries - what lessons for Wales?

- A1. This annex considers high-level evidence on the performance of a set of, mainly smaller, countries. A separate project is underway to review more detailed evidence on the relative effectiveness of specific policies adopted across a range of regions and countries that are comparable to Wales.
- A2. A particular focus is placed upon countries that have achieved very rapid growth. The analysis is intended to throw light on the issue of whether Wales could hope to replicate the experience of such countries.
- A3. In all this, there is a need to be wary of looking only at success stories. Features and policies that appear to be associated with success may turn out to be incidental, once less successful cases are examined and similar features or policies are found.
- A4. This annex does not pretend to offer a comprehensive analysis of the economic development processes in the countries considered, which would be a massive task. Instead, the approach is to review high level indicators in order to provide a broad overview of trends over recent decades, and to draw some provisional conclusions on the main factors influencing the rates of growth observed.

Factors promoting economic growth

Economic performance and economic growth

- A5. While it may seem obvious, it is very important to distinguish levels from changes in economic performance. Wales, for example, has over recent decades experienced a rate of economic growth that is broadly similar to that seen across developed countries. It is the level of output that is the issue, and this is associated with the problem of low rates of economic activity⁹ - that is, with not enough use is being made of potential inputs.
- A6. In general, economic growth (the growth of total output) results from some combination of the growth in inputs and the efficiency with which those inputs are used, that is, in "total factor productivity" (TFP).
- A7. Economic inputs include labour (both quantity and quality, where the latter is strongly influenced by the system of education and training), and capital (buildings, equipment, and public infrastructure).
- A8. Total factor productivity reflects the nature of technology employed, and other factors affecting overall efficiency, such as the broad institutional context, competition, scale, the extent of the division of labour, and sectoral composition (eg how far an economy has moved away from dependence on agriculture). TFP growth results from changes in these factors, for example, through the ability to generate new ideas, or absorb new ideas developed elsewhere, which may be just as good.

⁹ At least, in so far as a comparison is made with UK outside the greater south east of England.

- A9. Labour and capital inputs to the production process can be supplied from either home or abroad. In so far as we are concerned with the well-being of people in a particular country, it is natural to focus on the income earned from the production of output using assets (including labour) owned by those people, and to express the results on a “per capita” basis. It is also appropriate in principle to adjust incomes by deducting the sums needed to ensure that the value of the stock of capital is maintained. In practice, however, it is not possible to take this final step.

Catching up

- A10. It has been found that much of the economic growth experienced by lagging countries that have rapidly “caught-up” has been due to an increase in the use of inputs¹⁰ - though improving efficiency (TFP) also appears to have been important in some countries (see table).

The contribution of capital, labour and TFP growth to output growth in rapid growth countries

	Capital	Labour	TFP	Output
1960-94				
Hong Kong	2.8	2.1	2.4	7.3
Indonesia	2.9	1.9	0.8	5.6
Korea	4.3	2.5	1.5	8.3
Malaysia	3.4	2.5	0.9	6.8
Philippines	2.1	2.1	-0.4	3.8
Singapore	4.4	2.2	1.5	8.1
Thailand	4.1	2.4	2.0	8.5
Taiwan	3.7	2.0	1.8	7.5
1978-95				
China	3.1	2.7	1.7	7.5
1986-96				
Ireland	0.8	1.8	2.7	5.3

Source: Barry and Crafts (1999)

- A11. Typically, un- (or under-) employed labour has been more fully exploited. Often lagging countries have increased their inputs by drawing in capital from abroad, through inward investment.
- A12. Such internationally mobile investment often seeks to exploit the benefits of relatively low wages in order to meet export demand. In other words, countries which are the recipients of such investment tend to have a comparative advantage in labour intensive activities.

¹⁰ See for example: Barry and Crafts: Some Comparative Aspects of Ireland’s Economic Transformation (1999). There is a debate about the relative contribution of TFP and inputs to growth in Asia, summarised in: International Monetary Fund, Singapore: Selected Issues (2004). The key point is that even on the larger estimates for the contribution of TFP, convergence has been driven by growth of inputs.

- A13. As lagging countries grow (and educational levels improve), wages increase, the balance of comparative advantage shifts, and further relocation of activities takes place. People in all countries can gain from the process of development, as it increases the scope for trade, which is generally a positive sum game (although there will of course be transitional costs, which can be high for some individuals)¹¹.
- A14. The pattern of locational advantage for particular sectors remains in permanent flux, however, with specific decisions resting on a wide range of factors, making outcomes for particular industries very difficult, perhaps impossible, to predict.

Growth at the “frontier”

- A15. Once the level of inputs has converged towards international norms, a country’s growth is likely to be driven mainly by changes in the quality of inputs (through education and training) and improvements in TFP, although capital accumulation remains important. Mechanisms exist (eg for transmission of new ideas) which suggest that some convergence in TFP (both levels and growth) is likely across countries, once they have crossed certain thresholds (eg in respect of the quality of institutions and existence of generally competitive markets). And empirical studies provide some evidence for such convergence occurring in practice.
- A16. Nevertheless, there may still be scope for countries to move ahead of the frontier by gaining “economic rents” (returns to expenditure that are unusually high). Small states may be well placed to do this, since they may be able to find specific niches (eg Monte Carlo), and/or may be able to operate regimes that would attract retaliation if operated by larger states (eg the Channel Islands). It may also be possible to gain rents by attracting companies that are able to earn high returns and which share some of those returns with their employees.
- A17. Government clearly has a vital role to play in creating the right conditions for economic growth. Governments need to act to ensure that inputs are of the right quality, particularly in respect of education and public infrastructure, and that policies promote efficiency, for example by making markets open and competitive.
- A18. It is arguable that there may also be scope for a more activist role in the earlier stages of development, when the attraction and mobilisation of inputs is likely to be more important than the efficiency with which they are used. For example, there are indications that, despite their many disadvantages, in larger countries tariff barriers can encourage inward investment, and thus the inflow of capital.
- A19. The scope for an activist role in the later stages of development is more controversial. For example, in recent times, some have argued that regional governments have an important role in creating and sustaining innovation and learning networks, or in creating “acquired advantage”. But good evidence that government activities in such areas really make a difference is hard to come by.

¹¹ It is possible to construct scenarios under which trade can turn entirely to the advantage of one country, with the other country losing out in aggregate. This could happen where technical progress allows poorer countries to improve productivity in richer countries’ export goods, thereby lowering their price and imposing a terms-of-trade penalty. The mainstream consensus is that this possibility depends upon a specific set of conditions, and that there have been few, if any, examples of these conditions being fulfilled in practice.

- A20. Overall, the balance of evidence suggests that, across developed countries like the UK and France, on average, people's incomes depend most strongly on their individual characteristics (particularly skills). A secondary influence is relatively close proximity to a major conurbation. Beyond this, where they live does not seem to make much difference (partly, of course, because people move)¹².
- A21. Recent major empirical research by the OECD¹³ has sought to draw some general conclusions about which policies are effective in promoting growth. Key conclusions include:
- long-term sustainable economic growth has many sources and cannot be fully steered by policy makers;
 - unsurprisingly, the pace of accumulation of physical and human capital plays a major role in the growth process, with the latter appearing particularly important;
 - the estimated impact of increases in human capital (as measured by average years in education) suggests high returns, though the scope for further benefits depends on the nature and quality of the education system;
 - trade is significant, with greater exposure to international trade being associated with faster growth;
 - ICT is playing an increasingly important role, and many of the benefits are expected to accrue in the ICT-using industries, particularly in the service sector;
 - there appears to be a marked positive effect from business R&D activities (though no hard evidence of benefits from public R&D);
 - beyond a certain point, high taxation (particularly direct taxation) impairs growth, as does a high level of transfers (as opposed to government investment);
 - pro-competitive regulation encourages growth by promoting innovation, catch-up and entry, thereby reducing inefficiencies, and by encouraging the exploration of new business opportunities;
 - low barriers to firm formation and entry are key elements, as is the effective supply of risk capital. Ease of *exit* is also an important influence on the *entry* decision;
 - excessively strict product market and administrative regulations can inhibit innovation.
- A22. In the light of this general body of evidence, the next section considers the implications of experience in a number of countries which have performed well over recent years.

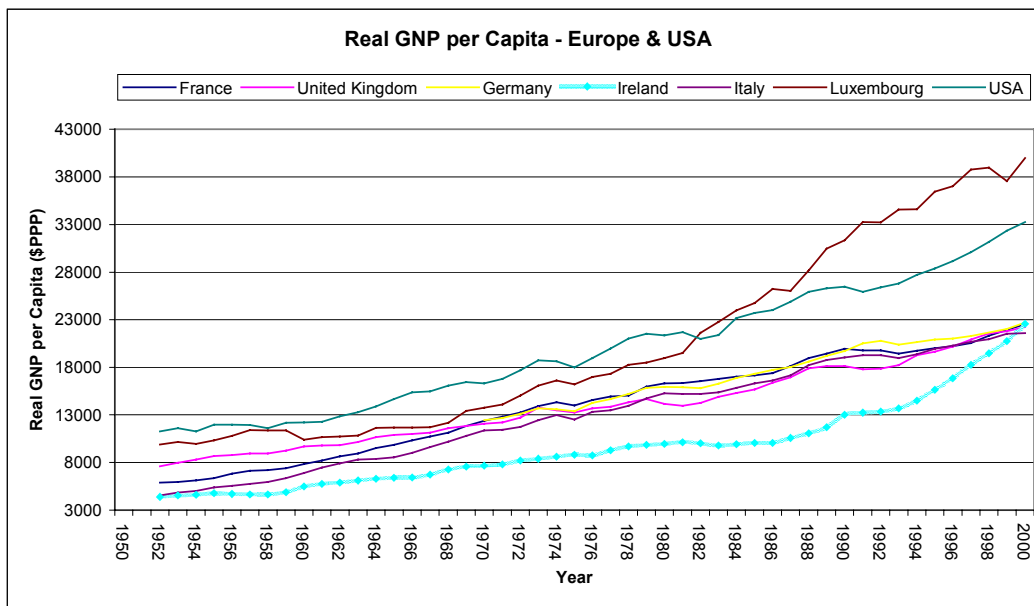
Ireland

- A23. Graph 1 illustrates the rapid growth experienced by the Irish economy over the latter part of the 1980s and the 1990s. (A selection of other countries has been included for comparative purposes.) In the latter years, the difference between GNP (which removes profits remitted abroad) as shown in the graph and GDP is quite stark (typically around 15%), and indicative of the key role FDI has played in the Irish success story.

¹² See for example: Rice and Venables: Spatial Determinants of Productivity: Analysis for the Regions of Great Britain (CEPR Discussion Paper No 642, 2004), Combes, Duranton, Gobillon: Spatial Wage Disparities: Sorting matters! (CEPR Discussion paper 4240, 2004).

¹³ The Sources of Growth in OECD countries. OECD 2003.

Graph 1



Source: Penn World Table

A24. Much as been written on that story, and while there are differences of emphasis, there is agreement that the following factors have been important¹⁴:

- the scope for catch-up, given decades of under-performance;
- the change to a more stable macro-economic environment in the 1980s (facilitated in the Irish case by effective social partnership);
- demographic factors, particularly the supply of a young and increasingly well-educated workforce;
- the creation of the single European market and the general expansion of global trade;
- a culture which was English speaking and for which Americans felt an affinity for historical reasons;
- the perceived attractiveness of Dublin;
- Government incentives, particularly a low rate of corporation tax¹⁵, and European aid;
- driven by the factors above, and crucially, large-scale inward investment, particularly in advanced sectors such as ICT and life sciences.

A25. Barry and Crafts (op cit) have also argued that the status of Ireland as a small, open economy encouraged the adoption of policies that imposed low costs on, and barriers to, business, though it seems that such policies were only in place, or only effective, in the 1980s and beyond.

¹⁴ A recent Irish summary is provided in "Ahead of the Curve", the report of the Enterprise Strategy Group to the Republic's Minister for Enterprise, Trade and Employment. Enterprise Strategy Group, Forfas, Dublin, 2004.

¹⁵ Official EU statistics suggest that Ireland still has the lowest rate of corporate income tax in the (enlarged) EU.

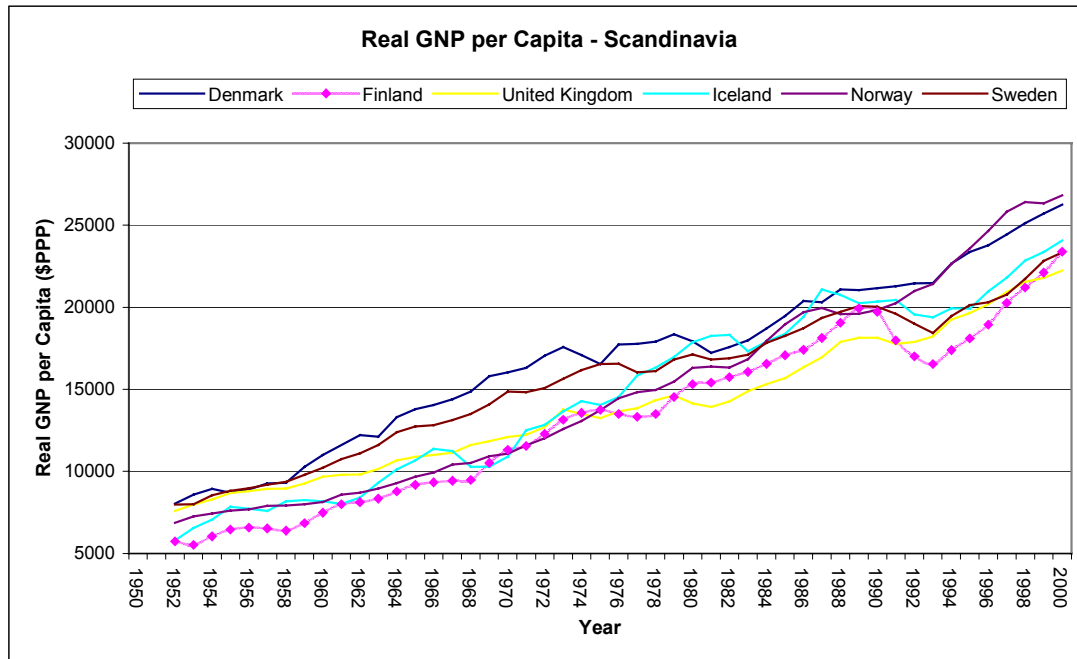
- A26. The role of targeting in respect of inward investment is one where the picture is not entirely clear, with some arguing that outcomes reflect a fair degree of luck, and perhaps the targeting of a particular market (the USA) and companies rather than specific sectors. This is an issue where research is intrinsically difficult.
- A27. Overall, it is clear that convergence has played a major role in the Irish story. The Irish economy radically under-performed over the 1950s to 1970s, and its current levels of GNP per person are not far from what might have been expected, had Ireland followed a similar trajectory to most other European countries.
- A28. It also seems clear that rapid convergence has been driven almost exclusively by export-led FDI. However, in the Irish case efficiency gains as reflected in TFP growth appear to have played a more important role than capital-deepening. If one were prepared to speculate, it might be the case that Ireland has experienced a delay in the surge in TFP that most developed economies in the 1950s and 1960s, and that FDI and the adoption of pro-competitive policies (from around 1980) were key element in remedying this deficiency.
- A29. There is as yet no real sign of evidence of policy success in terms of promoting the indigenous sector. A recent official review¹⁶ concluded that over the period 1990-2002, the real growth in both sales and exports of assisted indigenous enterprise was negligible. This compared with real (export) growth of around 10% per annum for foreign-owned companies.

Finland

- A30. Finland started the post war period rather behind the better performing European countries in terms of national income. During the 1950s, 60s and 70s its economic performance improved as resources were moved from agriculture into industry and services. Overall, Finland has been an average European performer for most of the post-war period. During the 1980s, Finland briefly enjoyed above average European income levels, but economic difficulties, including a major recession, brought it (sharply) back into the pack in the early 1990s. This massive recession was driven by a bursting asset price bubble and to a lesser extent the collapse in trade with the Soviet Union.
- A31. Following the recession, growth resumed in the latter part of the 1990s, restoring Finland's relative position towards the bottom of the set of northern European nations (see Graph 2).
- A32. Finland is quite unusual amongst developed countries in that improvements in TFP have accounted for the bulk of output growth since 1980 (OECD – op cit). However, there seems to be a large element of convergence in this trend, since at the start of the period Finland have relatively low levels of TFP.

¹⁶ In "Ahead of the Curve", op cit.

Graph 2



Source: Penn World Table

- A33. The success of Finland's telecommunications giant Nokia explains a substantial share of Finland's overall growth in the 1990s. Finnish estimates suggest that over the latter part of the decade the electronics equipment industry added 1.5% to annual real GDP growth and Nokia alone accounted for 1% of real GDP growth¹⁷. Without out this contribution, Finland would have very substantially under-performed its peers.
- A34. Researchers have attributed Nokia's present success to sound strategic R&D investment decisions in the 1960s and 1970s, particularly in the fields of radio transmission and (later) in digital technology (Frame, op cit). The success of Nokia has also been related to the policy environment, specifically deregulation (which forced Nokia to compete with foreign suppliers) and the requirement that Finnish technical standards meet internationally acceptable norms.
- A35. There seems to be a large element of chance, or at least path dependency, in the Nokia story, one commentator tracing its enduring strength to decisions made in the later 19th Century to keep the Finnish telephone industry open to foreign competition (Frame, op cit).
- A36. New technology based firms appear to have played an important role in Finland's growth since the early 1990s. An exploration of the key factors in this are beyond the scope of this paper, but to some extent at least the success of such firms seems to have depended on their relationship to Nokia, often as suppliers.
- A37. It is notable that, over the period 1980 to 1999, Finland created the second lowest number of jobs of any OECD country (OECD, op cit). The relatively strong

¹⁷ Olavi Rantala: Regional Economic Development in Finland in 1990s and the Outlook to 2005. 2001. Dave Frame: Finland and New Zealand: A Cross Country Comparison of Economic Performance. New Zealand Treasury Working Paper 00/1.

performance of both labour productivity and TFP over the period may in part be a reflection of the slow growth in employment.

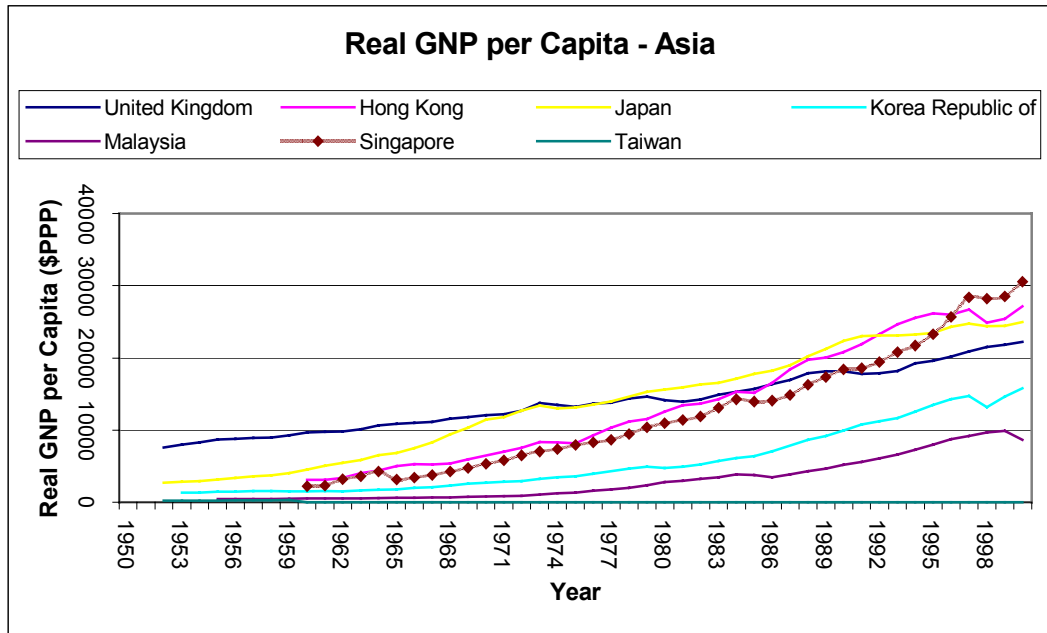
- A38. There has been a refocusing of industrial policy in Finland over the latter part of the 1990s, including the following elements (Frame, op cit):
- reducing tax burdens on business;
 - encouraging the development of SMEs;
 - promoting competition;
 - improving innovative potential by targeting financial support on research, product development and training, and moving away from other forms of state aid.
- A39. Finland has increased its spend on R&D over the period since 1985, but the timing of the most recent reforms are such that they cannot have played a role in the medium to longer term trends.
- A40. Furthermore, it is also apparent that the broad economic trends observed in Finland are quite typical of those seen in other northern European states, irrespective of policy orientation (arguably, the commitment to high levels of skill is the one common feature).

Singapore

- A41. Graphs 3 and 4 show long run trends in real GDP per capita at purchasing power parity. Graph 3 compares the performance of Singapore with a number of east Asian economies and in Graph 4 the comparison is with a range of small countries (with the UK included as background).
- A42. During the period from the late 1960s to the late 1980s, Singapore's GDP growth diverged from other east Asian countries (though the growth path does show some similarity with that of Hong Kong). Strong growth continued over most of the 1990s, and by the early years of the 21st century, in terms of GDP per head, Singapore was one of the best performing economies in the world, and not far behind the USA. It was also exhibiting the trend away from manufacturing and towards services common across developed economies.
- A43. However, three caveats to this story must be immediately entered. First, this comparison is based upon purchasing power parities. Comparisons made at market exchange rates over recent years result in a major reduction in the measure of Singapore's GDP per capita - typically by something between one-fifth and one-quarter, and move Singapore out the group of highest income countries (well below Hong Kong, and similar to Taiwan)¹⁸.

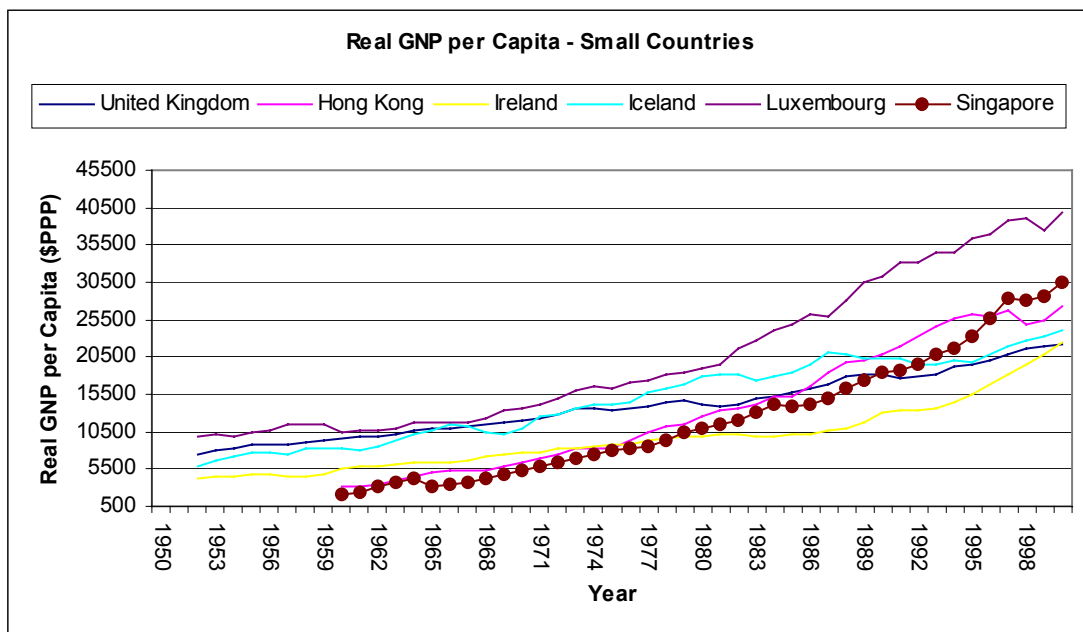
¹⁸ See for example World Bank statistics.

Graph 3



Source: Penn World Table

Graph 4



Source: Penn World Table

- A44. The extent of this difference between the two measures of GDP is rather perplexing. It may reflect some difficulties in the calculation of purchasing power parity. Or it may be a real effect, perhaps as a result of low prices in the service sector. If one were prepared to speculate, one might attribute such prices to the elastic supply of labour to a city-state such as Singapore, located as it is in a region where average incomes are much lower than in the city itself.

- A45. Second, Singapore's high GDP per capita reflects very high labour inputs. On average, each person works long hours, and a high proportion of the population works. During the latter part of the 1990s, when GDP per capita was generally around 90% of that found in the USA, it has been estimated that GDP per hour worked was only around 50% of the USA level¹⁹.
- A46. Third, as city-state, Singapore gains the benefits of agglomeration associated with cities, and these are reflected in the national aggregates.
- A47. In all three respects, there are parallels with Hong Kong, which, at least until the latter part of the 1990s, had a growth trajectory which was quite similar to that of Singapore.
- A48. A systematic review of the economic history of Singapore is clearly way beyond the scope of this paper. But there is a consensus in the literature that a high proportion, perhaps nearly all, of the growth in GDP over recent decades has been accounted for by the growth in inputs²⁰. On this account, GDP per capita has grown through increases in employment rates, hours worked, and the use of capital. Relatively little of the growth appears to be attributable to TFP.
- A49. In much of the literature, considerable weight is given to the role of foreign direct investment (FDI) in this process²¹. At least since 1965, Singapore has actively encouraged FDI. In the period since the mid 1980s, the policy of the Singapore government has been to try to shift towards higher value-added activities, including promoting investment in skill intensive industries and encouraging automation and computerisation. There have also been policies aimed at deepening the technology base and formulating cluster development.
- A50. There is no definitive evidence on the effectiveness of these policies. But simple consideration of timing suggests that they cannot be the fundamental explanation of the longer run success of the Singaporean economy. As has been noted above, this success appears to be much more a consequence of the growth of inputs than the exploitation of gains from innovation or improvements in efficiency. It is clear, however, that state support for export-oriented FDI has played a major role in the story, and that the status of Singapore as a city-state has also been important.

China, India and Eastern Europe

- A51. China, India and Eastern Europe are obviously in a different category from the countries considered so far, in terms both of size and stage of development, but it has been suggested that their prospective growth could have major implications for the future performance of smaller countries.
- A52. Despite strong growth over the 1980s and 1990s, by 2001 China's real GDP per head at PPP was still only 15 per cent of US levels (up from 5 per cent in 1978).

¹⁹ See Van Ark and McGuckin; International Comparisons of Labour Productivity and Per Capita Income, Monthly Labor Review, July 1999.

²⁰ Barry and Crafts (1999) and IMF (2004), op cit.

²¹ See Jagdish Bhagwati: The Miracle That Did Happen: Understanding East Asia in Comparative Perspective, Keynote Speech delivered at Cornell University Conference on "Government and Market...", 1996.

India's real GDP per head was still only 7% of US levels in 2001. These huge gaps indicate the ways in which China and India could, with the right policies and institutions, raise their output per head by replicating western technology, educating their people to much higher standards and increasing their capital stocks.

- A53. Nevertheless, convergence is likely to take a long time: if US GDP per head were to rise at 2 per cent per year and China at 4%, it would be a century before close convergence was achieved.
- A54. Overall, growth of this kind would be beneficial for world economic growth, and for the prospects of already developed countries. Trade would grow, on the one hand opening new markets for products from developed countries, and on the other providing a source of cheaper goods and services. The basic principles of comparative advantage show that this is a mutually beneficial process (though as with any improvement in productivity, there may be individual losers).
- A55. It is however, impossible to predict the outcomes for individual industries. The growth in demand from within rapidly developing countries will be met by some combination of domestic production and imports, but the precise combination will vary across both industries and time, depending upon a range of factors including relative wage levels and the supply of capital.
- A56. It is clearly wrong to assume on the one hand that all production will relocate towards rapidly developing countries, or on the other that the revival of world demand will simply reinstate older patterns of production and employment.
- A57. Present trends are for manufacturing firms in the UK to progressively shift basic production abroad, while emphasising design, branding, marketing and supply chain management at home. Increasingly, basic production is taking place at home only if it is either very capital intensive (eg grain is turned into flour without any labour at all) or if geographical proximity is required (eg where the mix of goods ordered is changed on a daily basis). In the former case, the production part of the process will hardly employ anyone in any event.

Conclusions

- A58. Standing back and taking a very broad perspective, Wales emerges as a lagging region within an economy that is near the top of the economic world league table of larger countries. Over the medium to longer term, output and productivity growth in Wales has been broadly in line with that for the UK, and indeed the developed world as a whole. Furthermore, the level of productivity in Wales is not systematically below that of the UK, although there are some unexplained gaps in particular (service) industries. (And at the same time, there are of course concerns that the level of productivity across the UK is less than satisfactory, though compensated for by - internationally - high employment rates.) What has marked Wales out over the medium to longer terms is an activity rate which is low by comparison with that found in the wider UK economy.

- A59. Very rapid growth in output and productivity, as observed in, for example, some east Asian countries and Ireland, is typically associated with catching up (often with large increases in capital inputs provided through export-oriented FDI). This experience is not of great relevance to present Welsh circumstances.
- A60. There is also some evidence that FDI can yield spin-off benefits, for example through the introduction of new practices from which other firms can learn. And in so far as multi-national firms earn economic rents, these may be shared with their employees in the form of higher wages and other benefits.
- A61. However, once convergence approaches, potential gains from a strategy based around attracting FDI are likely to be relatively modest. For this reason, many “convergence” countries have adopted alternative strategies apparently based on promoting innovation and knowledge intensive industries. Such strategies may be more relevant to Wales.
- A62. High level comparisons at the country level cannot provide much hard evidence on whether such strategies work, but simple considerations of timing make it clear that approaches of this kind do not lie behind the rapid convergence of countries like Singapore or Ireland. And the common growth patterns of Finland and the other northern European nations, despite differences in policy regimes, also suggests few easy lessons here - and certainly not much sign of a policy-related “silver bullet”.
- A63. There have been fewer comparative studies at the regional level, perhaps because of data limitations. One of the most recent attempts at a systematic study examined the impact of structural funds on growth across EU regions. It found little evidence of a positive impact, except in respect of funds targeted at education and the development of human capital²².
- A64. In summary, therefore, it is difficult, if not impossible to draw detailed lessons about the efficacy of specific policies from a review of aggregate economic performance. However, the aggregate data does tend to count against claims that the overall performance of countries depends crucially upon differences in policies towards particular industries or sectors.
- A65. Of course, such policies may be worthwhile even if they are not transforming. The review of the effectiveness of policies at the detailed level requires a much more disaggregated approach, and a separate study is proposed to take this forward.

²² See Rodriguez-Rose and Fratesi: *Between Development and Social Policies: The Impact of European Structural Funds in Objective One Regions*, Regional Studies Vol 38 No 1, 2004.

Implications of the analysis: answers to some common questions

Q1. Why can't Wales reproduce the performance of growth tigers such as Singapore, Ireland, and Finland?

A1. When countries have experienced sustained periods of very high economic growth, they have normally been converging towards levels of output per head already seen in the most developed countries (ie towards the "frontier"). A typical process involves large increases in capital and, in many cases labour, as employment shifts out of agriculture, often facilitated by export-oriented inward investment. Many of the drivers of the process (eg relatively lower wages) dissolve as convergence approaches. Despite some obvious difficulties, in global terms, Wales is near the frontier in terms of output per worker.

Q2. Surely Finland doesn't fit this pattern?

A2. Over the last couple of decades Finland's rate of growth has been broadly in line with that seen across Scandinavian and other developed economies (despite a very major recession in the early 1990s). Finland's growth is only unusual in that a large part is accounted for by TFP (efficiency) improvements rather than increases in inputs (capital and labour). But this seems to reflect another form of convergence - at the start of the 1980s, Finland was a relatively poor performer in terms of TFP. Sectoral shifts - away from low value primary production - appear to have played a particular role in driving convergence in this case.

Q3. What about the role of high-tech in Finland?

A3. The first thing to note is that overall growth in Finland has, over the last two decades, been very similar to other northern European countries (Norway, Denmark, Sweden). So particularities of individual countries' policy regimes are not an especially plausible starting point for explanations of growth performance. (It is worth noting, however, that a commitment to education is a common feature across the region.) Much of Finland's success in the high tech sector is attributable to one firm, Nokia, whose history appears rather idiosyncratic (with one commentator attributing particular significance to the decision to de-regulate the telephone system in the latter part of the 19th century). Nokia has by itself contributed around 1% per annum to Finland's growth over the 1990s, and many other high tech firms are suppliers to Nokia.

Q4. But surely Wales lags way behind such countries?

A4. The economy in Wales is closely integrated with that of the rest of the UK. The UK as a whole is close to the frontier in terms of output per worker, although there is a gap of around 15-20% relative to much of Northern Europe (Scandinavia, Netherlands, France, Germany, Switzerland). Much of this gap is explained by lower capital intensity and lower levels of skill²³. Living standards do not show such a gap because of relatively high employment rates in the UK.

²³ Although some of the gap attributed to skills may be a consequence of the greater exclusion of the low skilled from work in some continental countries.

Productivity growth in Wales is broadly in line with that in the UK, which in turn is broadly in line with other developed countries. And there is not much sign that the level of productivity in Wales is below that in the rest of the UK either, except perhaps in some service industries. Over the medium to longer term, the prime reason that Wales has lagged behind many otherwise comparable UK regions is an activity rate that is low in UK terms.

More broadly, there is evidence that, across countries with well-developed institutions, differences in people's income levels are driven most strongly by variations in their personal characteristics (especially skill levels). The next most important influence is proximity to major agglomerations. The Scandinavian economies certainly benefit in the first respect, and even in the second the balance of advantage is not clear - Cardiff is very much smaller than Copenhagen, Stockholm and Helsinki, all cities of over 1 million people. Even Oslo is almost twice as big as Cardiff. South-east Wales taken as a whole is of course much larger than Cardiff, but does not seem to gain the benefits commensurate with its population.

The benefits of agglomeration also confer an obvious advantage on city states.

- Q5. If Wales already has internationally high employment rates, surely productivity improvements are a more promising opportunity than employment increases?
- A5. Wales does have internationally high employment rates. But these need to be seen in the context of the broader UK economy. Employment propensities are influenced by a range of factors such as the operation of the tax and benefits system and social and cultural norms. International comparisons therefore need to be treated with care. Furthermore we know that inactivity in Wales, as across the rest of the UK, is concentrated amongst the low skilled. And the "Welsh excess" inactive are predominantly working age males on incapacity benefits. For these reasons, inactivity is both a problem and an opportunity. There are a number of promising policies both in operation and under development in this area. In contrast, the consensus amongst economists is that policies to raise the long run rate of productivity growth for countries at or near the frontier are likely to be effective only over long term (if at all) - there are no quick fixes.
- Q6. Surely we are under threat from the growth of China, India and Eastern Europe?
- A6. In principle, growth is not a zero sum game. Some activities will move in response to changing patterns of comparative advantage. But world demand will increase for many goods. And we will have comparative advantage in some areas. However, sheer complexity makes detailed prediction of the effects for particular sectors and specific locations impossible. And there is no reason to believe that changes won't be manageable over the likely time-scales.
- Q7. What should the Assembly do?
- A7. First, the OECD has noted that over the last decade, changes in employment rates have been the biggest contributor to variations in economic growth. There is plenty of scope for more action in the labour market in Wales to promote higher employment (much is already in hand, of course).

Second, there is much to do to ensure that the “basics” (as identified by the OECD) are right - notably in respect of education and infrastructure.

Third, policy can contribute to making Wales a more attractive place to live and work for the more highly skilled. This points again to the importance of infrastructure (particularly communications) and to the need for responsive planning policies.

Fourth, there may be opportunities to earn “rents” by promoting, attracting and retaining companies that share high returns with their employees (by paying them more than they could earn elsewhere). But such policies need careful design and evaluation since it is difficult to pick winners and there is a danger of stimulating unproductive lobbying activities, as companies divert management time and effort to encouraging favourable treatment. And evidence suggests this is likely to be a less important factor than the first three. (A separate research study is proposed to make sure that we are fully informed about the latest evidence on the range of relevant policies that have been tried across regions and countries.)