Outlook and appraisal

Overview

Scottish GDP continued to rise in the third quarter of last year but by less than the UK. However, over the year to the third quarter Scottish GDP grew by 2.1%, faster than the outturn of 1.6% in the UK. Estimates of recent Scottish growth have been revised upwards following the introduction of a new data series, which adopts the chain-linking methodology. This approach allows industry shares (weights) in total Scottish value added to vary annually, allowing more accurate estimates of Scottish GDP growth.

The Institute welcomes the adoption of the new methodology and considers it superior to the previous fixed-based method where industry weights were allowed to vary only every 5 years. However, we are concerned that both the old and new methods do not provide a clear indication of the relative contribution of industry growth to the overall change in GDP. The electronics industry is cited as a case in point, where the series shows that from the mid 1990s to 2000 the volume of output produced by the sector grew 5 times faster than the Scottish economy as a whole, yet the contribution of electronics to the overall value of Scottish produced output actually fell! This was probably due to a rapid fall in the prices of electronics goods. Yet, we do not know for certain, an issue that is clouded by concerns about the accuracy of the measurement of industry value added that forms the basis of the annual weights.

In these circumstances, when popular discourse has seriously overestimated the contribution of electronics to the Scottish economy, we feel that there is a need for more openness and transparency from the Executive in the production and discussion of the Scottish GDP statistics. In particular, it is surprising that the Executive has made little or no attempt to offer a narrative to explain the underlying economic changes.

Our growth forecasts have been revised to take account of the latest information including the introduction of chain-linking in the construction of the GDP growth series. Growth in 2004 is expected to be 2.1% rising to 2.7% in 2005 and 1.8% in 2006. Net job creation is expected to run at around 50,000 annually this year and next, while unemployment continues to fall. The outlook for the Scottish economy is therefore promising as external demand continues to rise as world trade grows and as domestic demand growth moderates only slightly.

GDP and output

The Scottish Executive has now published quarterly GDP data for the third quarter 2003 and earlier under the new chained volume approach. The series is again comparable with UK GDP data, which adopted this approach from the second quarter 2003. A more detailed discussion of the implications of chain-linking for Scottish GDP and gross value added (GVA) estimates and some issues arising is provided below.

In the third quarter of 2003, Scottish GVA is estimated to have risen by 0.3% compared to a rise of 0.7% in the UK. Removal of the production of oil and gas to allow a like-for-like comparison indicates growth of 0.3% in Scotland in 2003 Q3 compared to growth of 0.8% in the UK. However, a comparison of growth in the latest 4 quarters over the previous 4 quarters reveals Scottish growth of 2.1% - with and without oil and gas - compared to UK growth of 1.6% and 1.7% ex oil. Through the adoption of the new chain-linking methodology recent Scottish growth is now stronger than under the old fixed-based approach - see below.

In the most recent quarter, Scottish growth continued to be driven by the service sector, which grew by 0.4% in the third quarter compared to growth of 0.9% in the UK. The construction sector also performed strongly here growing by 2.7% in contrast to growth of 2% in the UK. However, the growth of the production sector was weaker in Scotland contracting by 0.6% compared to a smaller fall of 0.2% in the UK. Within production, the dominant manufacturing sector continued to contract in Scotland with output falling by 0.6%, while UK manufacturing enjoyed a small increase in output of 0.2%. UK manufacturing continues to move slowly out of recession with positive growth registered for the last three quarters. Scottish manufacturing, in contrast, continues in recession with output now having fallen for 11 out of the last 12 quarters.

Over the year to the third quarter stronger Scottish growth is largely driven by the superior performance of services with growth of 3.5% compared to 2.5% in the UK. Over the same period, Scottish construction grew 4.4% while UK construction grew by 6.1%, and manufacturing in Scotland contracted by 3.9% with UK manufacturing exhibiting only a 0.7% fall.

Within services in the most recent quarter, the strongest sectors were business services and financial services with growth of 1.8% and 1.5%, respectively. Both sectors performed less well than their UK counterparts in the third quarter, with UK business services growing by 2.1% and financial services in the UK growing by 2.2%. The weakest performing Scottish service sector in the third quarter was hotels & catering which contracted by 3.3%, while the sector in the UK grew by 0.9%. However, over the year to the third quarter all of the 6 reported sub-sectors within services performed better in Scotland than in the UK. Other services grew by 6% in Scotland (-0.1% in the UK), retail & wholesale grew by 5.6% (3.2% in the UK), business services grew by 5.4% (4.7% in the UK), hotels & catering grew by 4.9% (3.5% in the UK), financial services grew by 4.1% (3.2% in the UK) and transport & communication grew by 2.5% (0.1% in the UK).

Within manufacturing during the third quarter almost all of the reported Scottish sectors reported weaker growth than their UK counterparts. Chemicals contracted by 2.4%, other manufacturing contracted by 2.1%, metals contracted by 1.7%, transport equipment contracted by 0.9%, drink contracted by 0.6% and both food and electronics contracted by 0.5%. In contrast, paper, printing & publishing exhibited growth of 2.5% while textiles also grew by 2.4%. Over the year to the third quarter, all reported manufacturing sectors contracted with the exception of other manufacturing, which grew by 2.6%, and petroleum products & nuclear fuels, which grew by 0.1%. Only textiles and drink performed worse in the UK during this period. Electronics reduced output by 5.6% compared to a fall of 2.1% in the UK. Transport equipment contracted by 5.1% in Scotland while exhibiting growth of 4.8% in the UK. Paper, printing & publishing cut back by 6.5% compared to a fall of 1.7% in the sector in the UK. Finally, mechanical engineering lost 3.3% of its output in Scotland while UK mechanical engineering contracted by 1.9%.

Chain-linking - some issues

Through the adoption of the chain-linking methodology, the new Scottish GDP series allows industry weights or shares to vary between 1995 and 2000, which are then 'chain-linked' with 2000 set as the base year - the last year for which data on industry or sector shares are available. Industrial weights will now be updated every year with the base year set 3 years previously - e.g. 2001 in 2004 - reflecting the availability of new information on industry shares. This contrasts with the earlier fixed-base approach

where weights were held constant at a given base year, which was 1995 in the previous data series.

The adoption of a chained volume approach is reported by the Executive to have produced a slightly larger impact on estimates of Scottish GDP compared to the effect on UK GDP estimates. Under the new series Scottish GDP is estimated to have grown more slowly per annum between 1996 and 2000 (2.1% compared to 2.3% on the old series) but more quickly between 2000 and 2002 (1.6% compared to 0.6%). The Executive ascribes these differences as being

> "mainly due to the fact that the updated weights for Electrical and Instrument Engineering ("electronics") fell in 2000, reducing the negative effect of the major decline experienced in Scotland post 2000, while, simultaneously the increasing strength of the service sector had a greater positive impact on GDP with increasing weight between 1995 and 2000."[1]

The Institute welcomes the adoption of the new chain-linking methodology in the production of Scottish GDP estimates. The new methodology has several advantages over the old fixed-base approach.

First, the application of annual weights implies that the value of industry shares in overall GDP (industry structure) are more up-to-date and are therefore more relevant.

Secondly, revisions due to re-basing will occur to a much-reduced extent. Revisions to data will in the future be mainly the result of improvements in data quality for industry weights and for the production of sectoral indices.

Thirdly, annual chain-linking reduces the inaccuracies caused by the assumption of a stable relationship between GVA and turnover over a period of 5 years – the normal gap between re-basing in the fixed-base approach. With the adoption of chain-linking such an assumption has to be maintained only from one year to the next.

Finally, with the fixed-base approach a link year is chosen to link the old and new series each based on a different set of weights. The choice of link year is subjective and the optimum year may vary across industries. With chain-linking, there is no subjective choice because every year is a link year.

On the other hand, the main disadvantage of annual chain-linking is that, apart from the latest base year, indices do not add to totals because a different scaling factor is applied to each series in earlier years.

Overall, the advantages of chain-linking are considered to far outweigh the disadvantages and so more accurate estimates of the change in industry output and aggregate GVA and GDP are possible.

Valuable as the new series is, its publication does raise several issues that relate to the usefulness of volume measures as a guide to GVA change in an economy at the industry and aggregate levels and the accuracy of the estimates of the measurement of industry value added itself.

The case of the electronics industry in Scotland offers an excellent illustration of this point. Moreover, it highlights the need for Scottish Executive statisticians and economists to explain more fully to the wider public what the economic narrative might be that lies behind the data. We contend that the failure to do this has led to the development of significant misconceptions about the role of electronics in Scottish economic performance, which may also apply to some other sectors.

First, in both the old fixed-base series and the new chain-linked approach, the indices for each industrial sector report the change in the *volume* of production on a quarterly and annual basis. Yet, one cannot automatically deduce from a comparison of growth in the volume of output in an industry what is happening both to its own value added, or its contribution to the overall income generated in the Scottish economy. There are several reasons for this: the average relative price charged by the industry may have changed; input prices may also have changed; and the sector may have substituted in favour either of local resources, or inputs from outside the local economy.

Continuing with the example of electronics. Between 1996 Q1 and 2000 Q3 the sector grew on average by 2.79% per quarter. The Scottish economy as a whole grew by an average of 0.51% per quarter over the same period. Therefore, electronics can be said to have grown more than 5 times faster than the Scottish economy as a whole. This might lead to the not unreasonable expectation that by 2000 the weight of electronics should have increased. But this was not in fact the case, because the growth in the volume of electronics production bore little relation to the change in value added.

Executive statisticians have informed us that the weight of 60 or 6% given to electronics in 1995 and used in the old series was incorrect. Information now available suggests that the share of Scottish aggregate value added contributed by electronics was actually 5% in 1995. The new series indicates that the weight (share) of electronics in 2000 is 46 or 4.6%. So, despite the volume of electronics production growing 5 times faster than Scottish GDP between 1995 and 2000, the share of electronics in total Scottish value added actually fell!

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1 "Introduction of chainlinking to the Scottish GDP estimates – 2003 Quarter 3" Scottish Executive OCEA – Statistics February 2004.

It would appear to be the case that the relative price of electronics goods began to fall markedly after 1996 and perhaps because of this the demand for such products rose with the volume of goods growing by 2.79% per quarter on average or more than 10% a year up to and including 2000.

If the value added data are correct, and we do have some reservations, which are noted below, then the 'boom' in electronics that many thought had occurred in Scotland up to the third quarter of 2000 on the basis of the volume growth data did not in fact occur. Indeed, with the share of electronics in Scottish value added never above 5%, except perhaps briefly in 1996 and 1997, popular discourse has seriously overestimated the contribution of electronics to the Scottish economy. While electronics contributed to exports unlike many non-traded services, it did not develop local supply linkages like the drinks industry and so had little further indirect effects on the Scottish economy. It is now evident from these data that the direct contribution of electronics to the Scottish economy was less than construction, little greater than food and drink and by 2000 less significant than hotels and restaurants. So much for "Silicon Glen!"

Indeed, the corollary of this is that contraction in the volume of electronics production post 2000 was less significant to the overall Scottish economy than many realised at the time. By 2000, the share of the sector in Scottish value added was lower than generally believed and so with the replacement in the new chain-linked series of the 2000 weight for the incorrect 1995 weight of 6%, the growth of Scottish GDP was much better post 2000 than under the old series[2]. Moreover, it is probable given the large drop in the volume of electronics production to 2003 Q3 that the share of electronics in overall value added will have fallen further, assuming that the relative price of electronics goods did not rise to offset the impact of falling volumes. In these circumstances, we must expect the growth of Scottish GDP for 2001, 2002 and 2003 to be revised up further when the weights are changed annually in the chain-linked GDP series.

The second point at issue concerns the measurement of industry value added that forms the basis of the weights in the construction of sectoral indices and the aggregated GDP index. The new chain-linked approach currently incorporates varying industry weights each year from 1996 to 2000, not before or after. The old series, which it replaced, employed fixed weights at 1995 and as we have seen with electronics, later and superior information suggests that many of these weights were inaccurate.

2 With falling electronics volume, the effect in lowering Scottish GDP is less when the share of electronics is smaller.

It appears that Executive statisticians use the ONS Regional Accounts data for 32 industry sectors to constrain industry and aggregate totals in the Scottish input-output tables. Weights used in chain-linking are then derived from each industry's relative share of GVA from the constrained input-output tables. Discussions with Executive statisticians reveal that this allows later and superior information from the Annual Business Inquiry (ABI) to be incorporated into estimates of weights (i.e. each industry's share of overall value added). However, Executive statisticians are on record[3] as believing that the use of ONS results from the ABI to constrain sub-national totals to national totals "is producing a downward bias in the results."[4] Accordingly, there must be some doubt whether the value added estimates for Scottish industries presently in use accurately account, on the output side for price and volume change, and on the input side for price, the volume of purchased inputs and the local supply content.

Finally, a key implication of the preceding discussion is that there is an issue of openness and transparency with respect to the production of Scottish GDP statistics. We must acknowledge that we have received much co-operation from Executive statisticians in responding to our information requests. However, the Executive has made little attempt to offer a narrative that explains the changes. The details of the construction of the Scottish GDP/GVA statistics will, for some, appear arcane and be considered the province of nerds and anoraks. But on such data rests our understanding of changes in Scotland's economic well-being, the need for policy intervention and the progress made towards the realisation of the Executive's principal policy objective.

Outlook

The evidence of recovery in the world economy continues to strengthen. In 2003, with world trade and domestic demand in many countries strengthening, the US economy grew by 2.9%, while the Japanese economy recovered sufficiently to generate growth of 2.1%. China and several other Asian economies are also growing strongly. The Euro area, in contrast, remained weak, particularly in terms of domestic demand. The depreciation of the $ appears to have boosted US growth, at least for the short-term. Growth in the world economy is expected to accelerate further

3 "Note on methodology for Scottish ABI data" SESCG 5/2/2002.

4 We are aware that the Executive statisticians are seeking to adopt their own data cleaning and grossing using the ONS raw data, which will produce estimates that are not consistent with those derived by ONS. However, it has not been made clear that this approach has been adopted in the construction of weights for the new chain-linked series.

during 2004, with US growth expected to rise to 3.9%, German and French growth to rise from almost zero in 2003 to 1.6% and 1.9%, respectively. Japanese growth is expected to be a little weaker this year at 1.9% but remaining relatively strong by the standards of its recent history.

Growth continues to pick up in the UK moving closer to the long-run trend. Domestic demand continues to be strong, debt levels remain high and house price growth is still uncomfortably rapid. But there are no significant inflationary pressures evident. CPI growth over the year to January was 1.4%, compared to RPI growth of 2.6% and RPIX growth of 2.4%. Overall, GDP growth is forecast to be 2.8% in 2004 and 2.6% in 2005.

In Scotland, the latest business surveys suggest that manufacturing is recovering, with the Scottish Chambers' Business Survey reporting the strongest trends in orders and sales since 2000. Both construction and tourism appear buoyant, although retail trends appear to have weakened despite the strong growth in sales reported by the Scottish Retail Sales Monitor to January.

Against this background, we present revised forecast for the Scottish economy – see *Forecasts of the Scottish Economy* section. Our forecasts are revised to take account of the latest information including the introduction of chain-linking.

In the light of this new information, we have revised up our forecast for Scottish GDP growth in 2003 from 1.3% to 2.3%. The growth forecast for 2003, and the estimates for 2002 and 2001 remain uncertain. This is because, as the above discussion of chain-linking suggests, the impact on Scottish GDP of the large fall in the volume of electronics output between 2000 and 2003 cannot be ascertained until the weights (value added shares) for the industry are made available.

Scottish GDP is forecast to rise by 2.1% this year increasing to 2.7% in 2005 and then falling to 1.8% in 2006. The service sector continues to be the main driver of growth with rates of 2.4%, 3%, and 1.8% forecast for 2004 through to 2006. The strong forecast for 2005 is in part a reflection of the forecast recovery of manufacturing, which we expect will recover slowly exhibiting 1.5% growth this year, 1.7% in 2005 and 1.4% in 2006. The relative buoyancy of the construction industry is expected to be maintained with growth of 1.2% forecast this year, rising appreciably to 3.2% in 2005 and 3.4% in 2006.

Continued buoyancy is forecast for the labour market with net jobs growth of 58 thousand forecast this year, 52 thousand in 2005 and 32 thousand in 2006. The bulk of the job creation will be in services but we are nevertheless expecting that manufacturing will add just under 7 thousand jobs this year, 8 thousand next year and a further 7 thousand in 2006. The preferred ILO measure of unemployment is forecast to be 5.4% this year, falling to 5.2% in 2005, and 5% in 2006, reflecting the reasonably strong jobs growth.

Overall, the outlook for the Scottish economy is promising as both domestic demand remains strong and external demand for Scottish products continues to strengthen allowing growth to return to trend this year and move significantly above trend in 2005.

Brian Ashcroft
23 March 2004