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Has the Growth of Real GDP in the UK been Overstated because of Mis-Measurement of Banking Output?

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January 2013

Abstract
If official figures overstated the growth of banking output in the UK in the recent boom, does this mean that GDP growth was overstated too? The answer is no. It is truer to say that if banking output was overstated then the output of some other industry or industries must have been understated, leaving GDP relatively unaffected. The reason is that the Office for National Statistics measures the real growth of GDP primarily from the expenditure side. And from the expenditure side most of the problematic part of banking output drops out since it constitutes intermediate consumption not final expenditure. Consequently, the effect of any mis-measurement of banking output on GDP growth in the boom of 2000-2007 is likely to have been small: GDP growth might have been overstated by about 0.1% p.a.

JEL Classifications: E01, G21
Keywords: GDP, national income accounting, banking, financial services, mis-measurement

1. Introduction

It is frequently argued that the output of the banking industry was overstated during the boom. Bankers were selling financial products of low or no social value ("toxic rubbish") to ignorant or greedy clients. So if banking output were measured correctly it would be seen to have grown more slowly than the official figures from the Office for National Statistics (ONS) suggest. Consequently, since banking is a large industry in the UK, the growth of real GDP must have been overstated too. If this argument is correct, it would have serious consequences, not just for our view of the recent past but also for our view of the likely future. For if British growth in the run-up to the crisis was slower than we originally thought, then our view of the likely future path of GDP should be correspondingly more pessimistic, even when the economy has fully recovered from the Great Recession which began in 2008.

The purpose of this note is to show that this argument is wrong. Even if the premise is correct ("Banking output has been overstated"), the conclusion ("GDP growth has been overstated") does not follow. The error in the argument derives from a failure to understand how the ONS actually constructs its estimates of real GDP. Closer to the truth would be the assertion: "if banking output has been overstated, then the output of some other industry or industries must have been understated". Briefly, the reason why the argument is wrong is that the Office for National Statistics measures the real growth of GDP primarily from the expenditure side. And from the expenditure side most of the problematic part of banking output drops out since it constitutes intermediate consumption not final expenditure. [1]

This note first discusses the two approaches which the ONS uses for its estimates of real GDP: the expenditure approach (GDP(E)) and the output approach (GDP(O), also sometimes called the production approach. Then it moves on to explain how banking output is measured. Section 4 quantifies the size of the likely error in GDP due to mis-measurement of banking and finds it to be small. Section 5 offers some brief conclusions.

2. ONS methods of measuring the growth of real GDP

The ONS measures nominal (current price) and real (chain-linked) GDP from both the expenditure side, GDP(E), and from the output side, GDP(O). Nominal GDP(E) is the sum of nominal final expenditure on the various components (consumption, investment, government, exports and imports,

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[1] For brief definitions of these and other technical terms in national income accounting, see the glossary at the end.

the last with a negative sign). Alternatively, nominal GDP can be measured from the output side as the sum of nominal value added in all the various industries (including banking). In principle, nominal GDP(E) must equal nominal GDP(O), aside from errors and omissions (and abstracting from the fact that expenditure is normally measured at market prices but output at basic prices).

From the expenditure side, the growth of *real* GDP(E) is a weighted average of the growth rates in real terms of the various components of final expenditure (with imports again entering with a negative sign); the weights are the shares of each component in *nominal* GDP (nowadays with chain-linking the weights change every year). From the output side, the growth of real GDP is a weighted average of the growth rates of real value added in each of the various industries (including banking). In principle, the growth of real GDP(E) should equal the growth of real GDP(O), aside from errors and omissions.

In practice the two nominal estimates differ from each other as do the two real estimates. So there is a need for reconciliation on both the nominal and real sides. The nominal reconciliation is done using supply and use tables and is not in question here.[2] *The real reconciliation gives primacy to GDP(E) and adjusts GDP(O) to conform to it.* The National Accounts bible, *National Accounts: Concepts, Sources and Methods* (ONS, 1998), is quite clear on this point. It states: "In the UK economic accounts, the expenditure approach is used to provide current price *and volume* measures of GDP." [paragraph 11.164, emphasis added]. A more up-to-date statement is provided in the the 2010 Blue Book, page 91 (ONS, 2010):

> "The output approach provides the lead indicator of economic change in the short-term. However in the longer-term, it is required to follow the annual path indicated by the expenditure measure of real GDP (usually within 0.2 per cent of the average annual gross value added growth). To achieve this, balancing adjustments are sometimes applied to the output based gross value added estimates. An examination of the chained volume gross value added and expenditure measures of GDP shows what are considered to be excessive differences in growth for a number of recent years. The output-based estimate grew less quickly than the expenditure measure in 2006 but more quickly in 2007 and 2008. The largest difference in growth between the output and expenditure GVA measure was 0.6 per cent, which occurred in 2008. To reduce these discrepancies, a number of balancing adjustments have been made to the chained volume gross value added annual growth rates."

For example, a downward adjustment of 0.9% was applied to what was called Business services and Finance under the old SIC. This and adjustments to other sectors reduced the growth rate of GDP(O)

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[2] The 2012 Blue Book gives GDP in 2011, but the latest Supply and Use Table is for 2010. So there is as yet no complete nominal reconciliation between the output, income and expenditure sides for 2011. Hence the Blue Book shows a statistical discrepancy between the income and expenditure sides of £1.7 billion in 2011.

by 0.6% in the 2010 Blue Book's estimate for 2008. In general, such adjustments are applied to private services, never to production industries or government services.

In other words, annual estimates of GDP growth are based entirely on GDP(E). The annual growth of GDP(O) is adjusted to be consistent with that of GDP(E). In the past exact consistency was enforced. Nowadays a difference of up to 0.2% per annum is tolerated.

As far as I am aware, the ONS has never justified the primacy it gives to GDP(E) over GDP(O). But two reasons seem compelling:

1. To measure real GDP, you need price indices (deflators). These are much better on the expenditure side where the ONS can take advantage of its long-standing and well-developed consumer and producer price index programmes. By contrast the ONS lacks good price indices for many corporate services, including for example banking.

2. Even in the absence of errors and omissions, the growth of GDP(O) won't equal the growth of GDP(E) as it should, because within GDP(O) real value added is measured by single not double deflation (except for agriculture and electricity). Only with double deflation is the growth of GDP(O) equal to that of GDP(E) in principle (Oulton, 2004).

Quarterly growth of real GDP

By contrast, the *quarterly* growth of real GDP is based on that of quarterly GDP(O). But it must aggregate up over the quarters to be consistent with the annual estimates which are based as we have seen on GDP(E).[3] In other words, GDP(O) determines the pattern of growth *within* the year but growth *between* years is determined entirely by GDP(E).

All this is at Blue Book time, when annual real estimates of GDP(E) are available. But between Blue Books no such reconciliation with real GDP(E) is possible for the most recent quarters. So for these quarters, quarterly GDP growth is based entirely on the output side estimate. For example at the time of writing (January 2013) estimates for the first three quarters of 2012 and all four quarters in 2011 are based wholly on GDP(O) as is the annual estimate for 2011, the latest year covered in the 2012 Blue Book. This is because the latest Supply and Use Tables go up only to 2010. That is, the quarterly estimates for 2011 and 2012 and the annual estimate for 2011 are not (yet) based on a complete

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[3] The Denton procedure is used to ensure consistency between the annual and quarterly figures.

nominal balancing of the income, expenditure and output sides of the national accounts (Lee, 2012).[4] This is another reason to treat recent quarterly figures for GDP growth with caution.

3. ONS methods of measuring banking output

The current methodology distinguishes three types of financial services provided by the banking industry. First, Financial Intermediation Services Indirectly Measured (FISIM); second, fees and commissions; and third, what are now called Net Spread Earnings (NSE), which form part of the category labelled "dealing profits", The basic data are collected by the Statistics and Regulatory Data Division (SRDD) of the Bank of England who supply them to the ONS for use in estimating GDP.

Starting with the 2008 Blue Book the ONS has implemented the Eurostat standard for measuring FISIM in the national accounts, which in turn implements the 1993 System of National Accounts (SNA). Essentially, banks are considered to supply a service to their customers both through deposits and loans. The service is measured by the difference between the lending or borrowing rate and a reference rate, which is currently Bank rate. The current price estimate of FISIM is the appropriate interest rate spread multiplied by the value of the stock of deposits or the stock of loans. FISIM in constant prices is nominal FISIM deflated by the GDP deflator (Akritidis, 2007). In the current methodology FISIM can be purchased by households,[5] domestic corporations, and the rest of the world. But FISIM purchased by domestic corporations is classified as intermediate consumption and so does not feature in the expenditure measure of GDP. Intermediate consumption of FISIM was 44% of total FISIM in 2006, down from 56% in 1993. FISIM accounted for 66% of total banking output in 2005, down from 72% in 1992. Incorporating FISIM into the national accounts has added about 1.7% to the level of GDP, but up to 2004 anyway had only a minimal effect on the GDP growth rate.[6]

Conceptual issues relating to FISIM

The current methodology for measuring FISIM has been criticised from a conceptual point of view. It is claimed that the reference rate is too low because it is the riskless rate. Instead a rate which reflects

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[4] The statements in this paragraph have been confirmed by an email from Pete Lee of the ONS.
[5] However, when a household takes out a mortgage for house purchase, the FISIM attributed to this is counted as intermediate consumption. The reason is that house-owning households are considered to be running small enterprises which receive income from themselves in the form of the imputed rent of owner-occupiers. Part of this revenue is then deemed to be paid out in the form of FISIM to their banks. So a house price (but not quantity) boom fuelled by easy credit won't raise GDP(E), except to the extent that a rise in the relative price of houses increases the weight attached to the growth of real imputed rent. (The weight is nominal imputed rent as a proportion of nominal GDP.) Real imputed rent can't have grown very rapidly in the UK during the boom since not many new houses were built.
[6] Akritidis (2007), Figure 1 and Figures 10-12.

risk should be used. This would have the effect of compressing the interest rate spread and so reducing the size of FISIM, in the US case by 21%.[7] If adopted, this proposal would reduce the contribution of banking output to GDP growth by reducing its weight while leaving banking output growth unchanged.

A second conceptual criticism of FISIM is that rising profits in banking reflect the increasing assumption of tail risk (Haldane *et al*., 2010). On this argument the profits are real enough, but they will inevitably be followed by losses at some date. The current methodology does not take this into account. But if we think it should, then perhaps GDP should be risk-adjusted. In this case the implications would go well beyond banking: for example BP's past profits could be criticised as excessive for the same reason (the Deepwater Horizon disaster) and so UK GDP (or at least GNI) might have to be marked down.

Whether or not these conceptual criticisms are valid, the ONS has to implement the internationally-agreed methodology which is also now the one mandated by Eurostat. So even if the criticisms come in time to be accepted, it will probably be many years before they are adopted into the internationally recognised System of National Accounts.

Mis-measurement and capital gains

A basic principle of national income accounting is that capital gains and losses should not be included in GDP. However since banks engage so extensively in asset trading there is a suspicion that the Gross Operating Surplus that the ONS calculates from the data supplied by SRDD has included some capital gains during the boom, even though these should have been stripped out (Weale, 2009). If true, this would be a real error in the national accounts, and the internationally-accepted methodology for measuring banking output is not being applied correctly.

The concern here relates to Net Spread Earnings (NSE). Consider spot trading in foreign exchange for example. In the good old days a bank would aim to have a net exposure to foreign currency risk of zero at the end of each trading day. The bank would still hope to make money from its foreign currency operations but only by ensuring that the buy rate was usually below the sell rate. So NSE should only reflect that kind of profit. With the enormous growth of options and ever more complex derivatives in recent years, it is much harder to distinguish the regular profits of intermediation from capital gains (or losses) as a result of speculation on own account. In fact, the profit and loss survey

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[7] Basu *et al*. (2008). Their argument has been disputed by Fixler and Zwieschang (2010).

which SRDD uses to measure NSE asks the banks themselves to say what proportion of their trading profit is NSE.[8]

4. The effect of possible banking output mis-measurement on GDP growth

It is possible therefore that banking output has been overstated due to overstatement of NSE, or for other reasons. But as we have seen, the crucial issue for GDP is how much final expenditure falls on the financial services provided by the banking industry and what proportion of final expenditure might be mis-measured.

Table 1 shows some basic numbers for the banking industry ("Financial service activities, except insurance and pension funding", industry 64 in the Supply and Use Tables) since 2000.[9] In 2007 value added was 5.20% of GDP at basic prices and total final expenditure (TFE) net of imports was 5.25% of GDP; intermediate consumption was 3.26% of GDP (source: *Supply and Use Tables, 1997-2009*).[10] These shares all rose over the boom period 2000-2007.[11] And output and productivity in that industry were apparently also growing very rapidly. So it is tempting to ask, what would be the effect on measured GDP growth if in reality output had only grown at (say) the same rate as the rest of GDP, using the value added share as the weight for this industry. But this calculation would yield the wrong answer since 71% of final expenditure on banking services net of imports in 2007 was made by households. As argued above, measurement error is likely to be much less important here since households mainly buy plain vanilla products (current account deposits, and credit and debit card services), i.e. their expenditure is just FISIM.[12] So it is likely that any measurement error is concentrated on exports, which are mainly to foreign-based corporations, including banks, net of imports (payments by UK resident banks and corporations to foreign-based banks). Here is where we would expect to find the "toxic rubbish". Such sales accounted for 0.45% of GDP at basic prices in

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[8] SRDD's Profit and Loss form requires banks to report dealing profits, and within that NSE, for each of foreign exchange, securities and derivatives. NSE "should capture the difference between the sale/purchase price and the mid-market price at the time of the transaction".

[9] The definition of this industry, which is part of Section K of the 2007 SIC, is wider than the ordinary notion of banking. As well as commercial banks it includes the central bank, holding companies, venture capital and some but not all companies involved in asset management, such as unit trusts and investment trusts.

[10] Higher figures are often quoted but these must be for the whole financial services sector which includes also "Insurance and reinsurance, except compulsory social security and pension funding" (industry 65 of the 2007 SIC) and "Activities auxiliary to financial services and insurance activities" (industry 66).

[11] The shares of the banking industry's GVA in GDP and of intermediate expenditure on banking services continued to rise in 2008 and 2009. This is probably an artefact of the steep decline in Bank Rate, from 5.75% in 2007Q3 to 0.5% in March 2009 and thereafter.

[12] Some toxic rubbish was sold to households in the form of Payment Protection Insurance (PPI). The compensation bill for mis-selling of this stands currently at about £11 billion. But PPI was mainly associated with mortgages and so expenditure on it would be counted as intermediate, not final consumption.

2000, rising to 1.29% at the peak of the boom in 2007 (see Table 1 again). So rather than applying a weight of 5.20% (the value added share) to any error in measuring banking output, we should be applying a weight of at most 1.29%.

Suppose that instead of growing at its actual rate, this category of financial services had grown at the same rate as the rest of GDP.[13] Then one can calculate that real GDP would have grown at 2.90% p.a. instead of at its actual rate of 3.02% p.a. over 2000-2007. So hypothetically, if the dubious part of financial services had grown just at the same rate as the rest of GDP, then GDP would have grown more slowly, but only by 0.13% p.a.

Table 1
Final expenditure on, intermediate consumption of, and gross value added in banking services: proportion of GDP at basic prices, %

Year	House-holds' final con-sumption	Exports	Imports	Exports minus imports	TFE less imports	Intermed-iate con-sumption	Gross value added
2000	2.83	0.83	0.39	0.45	3.28	3.11	3.36
2001	2.67	1.01	0.42	0.60	3.26	3.27	3.57
2002	2.71	1.07	0.43	0.64	3.35	3.35	4.11
2003	2.71	1.25	0.49	0.76	3.47	3.15	4.37
2004	2.76	1.31	0.53	0.78	3.54	3.05	4.50
2005	3.01	1.43	0.68	0.76	3.77	3.30	4.82
2006	3.12	1.64	0.74	0.89	4.01	3.49	5.12
2007	3.14	2.11	0.82	1.29	4.43	3.26	5.20
2008	2.86	2.74	0.90	1.84	4.70	4.63	6.58
2009	1.94	2.37	0.75	1.62	3.56	6.34	7.25

Source   Supply and Use Tables. 1997-2009 (ONS, 2011). Banking services defined as "Financial services, except insurance and pension funding" (row numbered 64 of the Supply and Use Tables, industry 64 of the 2007 SIC).

5. Conclusion

The main conclusion is that any over-statement of banking output is unlikely to have had a large effect on the estimated growth rate of real GDP: a simple calculation suggests the overstatement of GDP growth might have amounted to 0.13% p.a. over 2000-2007. So, on this account, we should not revise down our estimate of future growth in the UK. Having said this, it is highly undesirable that there should be so much doubt about the true contribution of such an important industry as banking. To

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[13] Here I assume that nominal net exports of banking services are deflated by the GDP deflator.

improve on the current situation we need progress on the conceptual disputes around FISIM. For the ONS, the agenda should be to develop better deflators for banking (and for other industries within corporate services) and to implement double in place of single deflation for the estimation of real value added.

Finally, this note has been focused on a narrow issue, the one stated in the title. It should not be taken as denying that the financial crisis was the cause of the Great Recession. And its conclusions are quite consistent with the view that the crisis may have caused permanent damage to UK capacity, as I have argued elsewhere.[14]

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[14] Oulton and Sebastía-Barriel (forthcoming, 2013).

Glossary

Final expenditure	Expenditure which is considered part of GDP (e.g. stationery or electricity purchased by households; purchases of new buildings and machinery by businesses; expenditure by government in providing health and education services to households; exports of goods and services).
FISIM	Financial Intermediation Services Indirectly Measured; a measure of the services provided by the banking industry via loans and deposits.
GDP deflator	The price index for GDP, derived by dividing GDP in current prices by the chained volume measure of GDP (real or chain-linked GDP).
GDP(E)	GDP measured from the expenditure side; in current prices, total final expenditure minus imports, i.e. final consumption by households and government plus gross investment plus exports minus imports.
GDP(O)	GDP measured from the output side; in current prices, total GVA of all firms, households and government.
GNI	Gross National Income (formerly and still often called Gross National Product (GNP)); a measure of the income received by a country's citizens; GNI differs from GDP mainly by the addition of net property and labour income from abroad.
GVA	Gross value added; the value of sales (inclusive of taxes on production) minus the cost of bought-in goods and services (intermediate consumption), the latter at purchasers' prices. In current prices, the total of GVA across firms, households and government adds up to GDP at basic prices.
Imputed rent of owner occupiers	Notional payment made by an owner-occupier household to itself to measure the value of the benefit derived from living in the household's home; part of final consumption by households. After deducting intermediate consumption (composed entirely of FISIM in this case), the remainder constitutes a form of income ("mixed income") to the household and also a form of GVA which is counted as part of GDP(O).
Intermediate consumption	Purchases of goods and services by business on current account (e.g. office stationery or electricity), for incorporation into products sold to customers.
NSE	Net Spread Earnings; dealing profits of banks derived from trading in foreign exchange, securities and derivatives for clients; in principle excludes capital gains or losses arising from speculation on own account.
ONS	Office for National Statistics, the agency which produces the UK's national accounts
PPI	Payment Protection Insurance; insurance which supposedly protected borrowers from a change in their circumstances which might otherwise lead to default.
SIC	Standard Industrial Classification; currently the 2007 version is used.
SNA	System of National Accounts; the internationally-agreed set of principles and practices for constructing national accounts; negotiated under the joint supervision of the UN, the OECD and the IMF. The ONS currently uses the 1993 version, in the form mandated by Eurostat (known as ESA 1995).
SRDD	Statistics and Regulatory Data Division; the Division of the Bank of England which (amongst other things) collects the raw data on the banking industry.

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