PROSPECTS FOR THE UK BALANCE OF PAYMENTS

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Abstract

This paper presents disaggregated projections for the UK balance of payments up to 2020. Under conservative assumptions about underlying trends it is projected that the current account deficit will increase from 2% of GDP in 2009 to almost 5% of GDP by the end of the period. Empirical evidence indicates that a deficit of this magnitude is not sustainable and, if unchecked, will lead to a painful adjustment involving lost output and higher unemployment. The paper calls for industrial and other policies to improve UK trade performance, above all in manufacturing, but also in knowledge-intensive services (communications, consultancy, R&D, media etc). It also points out the need to safeguard London's role as a global financial centre.

JEL Codes: F14; F17; F37; L60; L80

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Prospects for the UK Balance of Payments

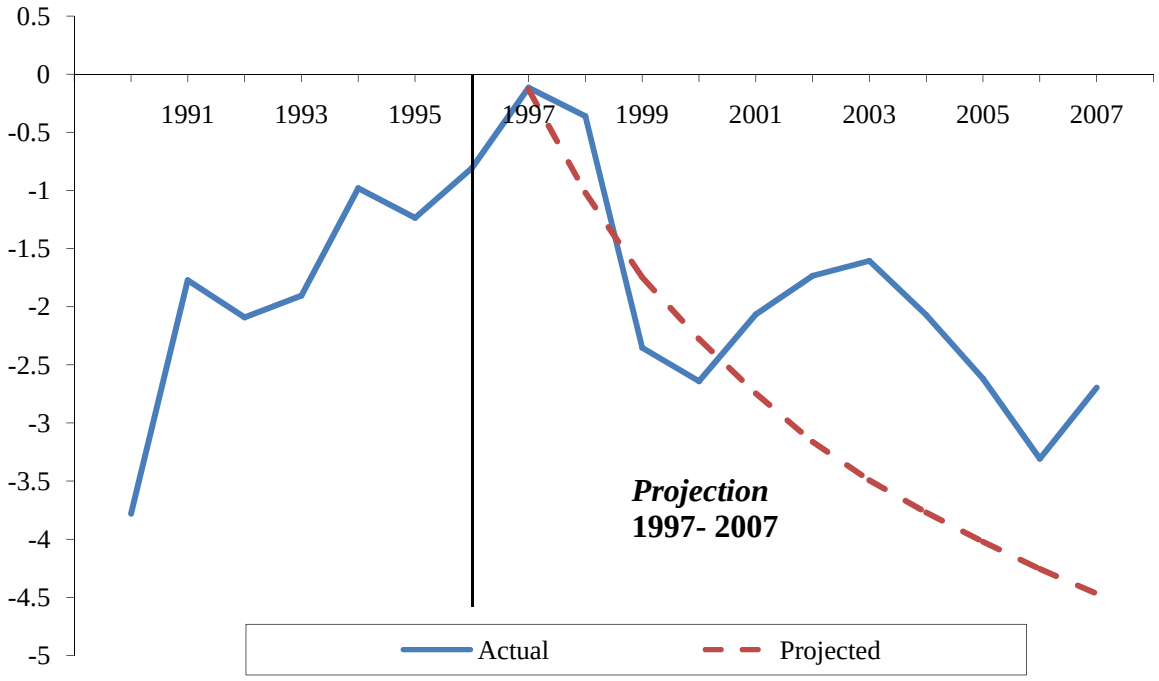
Over the past sixty years the UK economy has undergone huge structural changes.[1] In 1950 this country was a great industrial power with more than a third of its labour force employed in the manufacturing sector and a further million in coal mining. There was a trade surplus in manufactured goods equal to 10% of GDP and the country was a net exporter of energy. Since then, employment in the manufacturing sector has shrunk dramatically and coal mining has almost disappeared. There is now a trade deficit in manufactured goods equal to 4% of GDP and, after an interlude following the discovery of North Sea oil, the UK is now a large net importer of energy. The gap left by the decline of our traditional industries has been filled by a whole range of service activities, which now account for the bulk of employment and, collectively, earn a valuable trade surplus. In addition, the country enjoys significant net earnings in the form of interest, profits and dividends from international investment.

The costs and benefits of these changes, and what could or should have been done about them, were at one time hotly debated. However, such concerns were eventually buried under the euphoria of a prolonged economic boom and a bubble in house and share prices. They have now resurfaced following the credit crisis and ensuing recession. There is a widespread feeling that something has gone wrong, that the economy has become dangerously unbalanced, and we have put too much faith in finance at the expense of manufacturing and other activities. There are also new concerns about food and energy security in the face of rising world demand and limited supplies.

Previous Projections

Some years ago a small group of us in Cambridge, under the aegis of the Centre for Business Research, set out to investigate the role of manufacturing in the UK economy.[2] The manufacturing sector had been shedding jobs for some decades and the pace of decline had been faster than in other countries. The official index of production indicated that the aggregate output of UK manufacturing had been stagnating for nearly twenty years, whereas many other countries had experienced considerable growth in production. Was this situation sustainable over the longer term? In particular, was it compatible with the sound balance of payments required for national solvency? Would manufacturing exports be sufficient in the future to pay for the imports we require? If not, what alternative sources of income would be available to bridge the gap?

Figure 1: Balance of Payments Current Account (% GDP) old base projection: 1997-2007



We began our investigations at a time when the UK balance of payments had been improving for some years. The current account balance as a whole was close to zero (Figure 1). There was a small deficit on manufacturing trade and a small surplus on the totality of other current items. Our objective was to investigate whether this satisfactory state of affairs would continue, and to see if there were underlying trends that might disrupt this equilibrium and give rise to serious payments difficulties in the future. Our starting point was the "base projection".[3] This projection represented our best estimate of what would happen over a ten year horizon in the absence of policy changes or shocks. This is a much longer horizon than is usually attempted in macroeconomic forecasting. Under the base projection there was a steady deterioration in the overall current account culminating in a deficit equal to 4.5% of GDP in 2007. In the event, the current account did deteriorate but by less than projected.

In evaluating our projection, it is useful to consider manufactures and non-manufactured items separately. We projected that the trade balance in manufactures would get steadily worse, culminating in a deficit of around 4% of GDP in 2007. This turned out to be an accurate forecast, and our projection of the manufacturing balance tracked closely what actually happened.[4] We also projected a worsening situation on the non-manufacturing side of the account. This turned out to be wrong, which explains why the current account as a whole performed somewhat better than expected.

In recent years, the behaviour of the non-manufacturing side of the current account has been dominated by the following items, all of which have been subject to large changes that we did not foresee:

- *Finance ("The City").* Net overseas earnings of the financial sector have been on an upward trend for a considerable time. Starting in 2005 there was also a spectacular boom in which these earnings rose by 60% within the space of two years. Our projections got the upward trend, but not the recent boom.

- *Investment income.* Net investment income has fluctuated widely over the years. During our projection period, net income was boosted by a wave of cross-border mergers and acquisitions through which UK firms trebled their highly profitable stock of overseas assets. Towards the end of the period, net income was also inflated by the huge and unexpected losses sustained by certain foreign banks operating in London.[5] Our projections underestimated the growth of net income because we failed to anticipate either of these developments.

- *Energy, food and basic materials.* For some time before and after our projections began in 1997, the UK had a modest deficit on trade in these items. Net earnings from trade in energy (oil, gas, coal and electricity) were outweighed by expenditure on imported food, minerals and the like, but the gap was quite small as a percentage of GDP. However, from the turn of the century onwards the situation become much worse under the impact of falling North Sea oil production and rising import prices. Our projections took into account the fall in oil production but not the large price increases.

The above errors illustrate some of the pitfalls involved in long-term forecasting and highlight the inherent uncertainty surrounding major items in the balance of payments.[6] Without the unforeseen growth in overseas investment income and the recent boom in City earnings, there would have been a much larger deficit in the current account at the end of the projection period in 2007. Conversely, without the unexpected rise in import prices for energy, food and materials, the current account would have been close to balance in 2007. With hindsight, these developments can be explained, but they were not widely foreseen at the time.

Looking to the Future

The fate of our original projections is now water under the bridge. What about the future? What are the prospects for the UK balance of payments? To what extent will national solvency in the future depend on the strength of the manufacturing sector? What is likely to be the performance of this sector in the absence of major new policy initiatives? If manufacturing performs badly, will other sectors be able to fill the gap and generate the income required to pay for our imports? These are the questions the CBR group in Cambridge explored in our original projections. After more than a decade, we are now revisiting this topic and in the current paper we present a new set of projections for the period 2009-2020.[7] These projections come with a health warning. As we have seen above, some of the main items in the balance of payments are subject to great uncertainty and any longer term projection, such as ours, is therefore subject to a large margin of error.

A projection is a conditional forecast. It does not say what will actually happen. It forecasts what *would* happen under certain assumptions about government policy and the behaviour of a number of economic variables, such as the price of oil or the growth of world trade. Different assumptions yield different forecasts.[8] We start from the "base projection", which assumes no change in government policy and embodies a set of assumptions about broad economic trends that seem reasonable in the light of existing evidence. We then examine how varying some of the main assumptions would affect the projected outcomes. Such an exercise helps to identify potential sources of error and quantifies their relative importance. It also indicates the potential importance of various policy interventions to strengthen the balance of payments.

A full description of the projections is given in an appendix and here we describe only their main features.

Table 1 lists the main items in the current account. The headings shown are similar to those in our earlier projections. Most of them are self-explanatory. The main difference is that a separate category of "knowledge-intensive" services is identified. This heading covers a huge variety of services such as communications, construction, computer & information services, royalties and license fees, consultancy, R&D, audio-visual services etc. It excludes financial services and insurance. Knowledge-intensive services were previously lumped together with transport, travel and government services, but this is no longer appropriate given their increasing importance in the balance of payments.

Table 1: Main Items in the UK Current Account Balance of Payments 2008 (£ millions)

	Credits	Debits	Balance	%GDP
Surplus Items				
Financial services & insurance	60,864	15,282	45,582	3.2
Other knowledge-intensive services	66,955	38,944	28,011	1.9
Investment income	262,671	235,025	27,646	1.9
Deficit Items				
Manufactures	193,601	251,449	-57,848	-4.0
Energy (oil, coal, electricity & gas etc)	35,386	47,841	-12,455	-0.9
Food, beverages and tobacco	13,719	31,099	-17,380	-1.2
Basic materials	6,625	11,014	-4,389	-0.3
Transport and travel	40,478	57,632	-17,154	-1.2
Government services	2,102	4,062	-1,960	-0.1
Current transfers	15,422	29,032	-13,610	-0.9
Items not elsewhere specified	2,803	4,314	-1,511	-0.1
Current Account	**700,626**	**725,694**	**-25,068**	**-1.7**

Source: *UK Balance of Payments Pink Book 2009*, ONS; table 1.2, 2.1, 3.1.

Table 2: The Base Projection 2009-2020 Main Assumptions

Real domestic spending grows at 1.5% p.a. in 2010, 2.5% p.a. in 2011 and 3% p.a. thereafter.
World trade grows at 3% p.a. in 2011 and 5% p.a. thereafter.
Real price of oil increases at 2% p.a. in 2010 and 2.5 % p.a. thereafter.
Real price of food increases at 2% p.a. from 2010.
Volume of oil production falls by 7% p.a. from 2010.
Real balance on basic materials and other energy worsens by 0.05% of GDP annually.
Balance of financial services falls by 0.5% of GDP in 2009 from its peak in 2008.
Real exchange rate constant at the 2008 level throughout.

Base Projection: Assumptions

The main assumptions underlying the base projection are shown in Table 2. Further details are given in an appendix. In addition we assume that there is no change in government policy. The following are some points to note:

- *Exchange Rate.* The exchange rate plays an important role in the projections for trade in manufactures and also for certain other items such as trade in food and the valuation of overseas assets. We assume that the devaluation that took place in 2007-2008 is maintained throughout the projection period.

- *World Trade.* UK manufacturing exports are closely linked to world trade. We assume that world trade grows at 5% p.a. from 2010 onwards. This is similar to the historic trend.

- *Financial services*. Trade statistics for the first half of 2009 suggest there has been some fall in net earnings from financial services (ONS 2009, table F).[9] Taking a longer view, it is likely that global finance will become more regulated, more conservative, and on average less profitable than in the past. In themselves, such changes may harm the City and damage UK financial exports. However, they should be seen against the wider background of world economic growth. The current recession is coming to an end and prospects for UK financial exports should improve as the world economy recovers. Whatever happens in the short term**,** the longer term prospect is for continued growth in net earnings from financial services, perhaps at a slower pace than before. This is what our projection assumes.

- *Investment income*. This is a highly volatile item and it is difficult to know what will happen to it in the future. UK net income from investment was inflated in 2007-2008 by the huge losses of foreign banks operating in London. In line with the Treasury, we assume that net investment income falls back sharply in 2009.[10] Thereafter we assume, in line with past experience, that the rate of return on UK overseas assets is somewhat higher than on UK liabilities.[11]

- *Energy, food and basic materials*. These are also difficult items to predict. Our projection assumes that North Sea oil production falls at 7% p.a. after 2010. This is midway between the government's base case (9.0% p.a. after 2012) and the slower decline case (5.0% p.a. after

2009).[12] What will happen to prices in the short-run is highly uncertain. Over the long-run it is likely that world population growth plus rising incomes and falling reserves will lead a large and permanent increase in the world prices of energy, food and materials.[13] We assume that the *real* prices of oil and food will increase by 2.5% p.a. and 2% p.a. respectively from 2010 onwards. We also assume that the balance of trade in basic materials & other energy deteriorates at a trend rate equal to 0.05% of GDP per annum over the period as a whole.

Base Projection: Results

The main results for the base projection are as follows:

- *Unemployment* (ILO definition): after rising to a peak of just over 10% unemployment falls back again to 6.3% in 2020. This compares to a pre-crisis figure of around 5% (Figure 2).

- *Balance of Payments Current Account:* this deteriorates fairly steadily to reach a deficit equal to 4.7% of GDP by 2020 (Figure 3).

- *Manufactures:* the deficit on manufacturing trade initially improves because of devaluation, but this improvement is not sustained and the deficit eventually gets larger (Figure 4).

- *Other items*: the non-manufacturing side of the balance of payments is initially in surplus, but this is eventually transformed into a small deficit (Figure 4). This turnaround is due to the growing deficits in oil, food, basic materials and other energy, under the influence of adverse price and production trends (Figure 5). The most important factor is the increase in oil imports due to the rapid decline of North Sea production.

- *Investment income:* Net income from investment falls sharply in 2009 and from then onwards remains roughly constant as a fraction of GDP throughout the projection period (Figure 6).

- *Services*: Taken as a whole, services enjoy a large and growing surplus. Within this total, "traditional" services (transport, travel and government) are in persistent deficit (Figure 7). Net earnings from finance initially decline due to the credit crunch, but then gradually recover. There is also a sustained increase in net earnings from other knowledge-intensive services.

Figure 2: UK Unemployment Rate (% of Labour Force) base projection

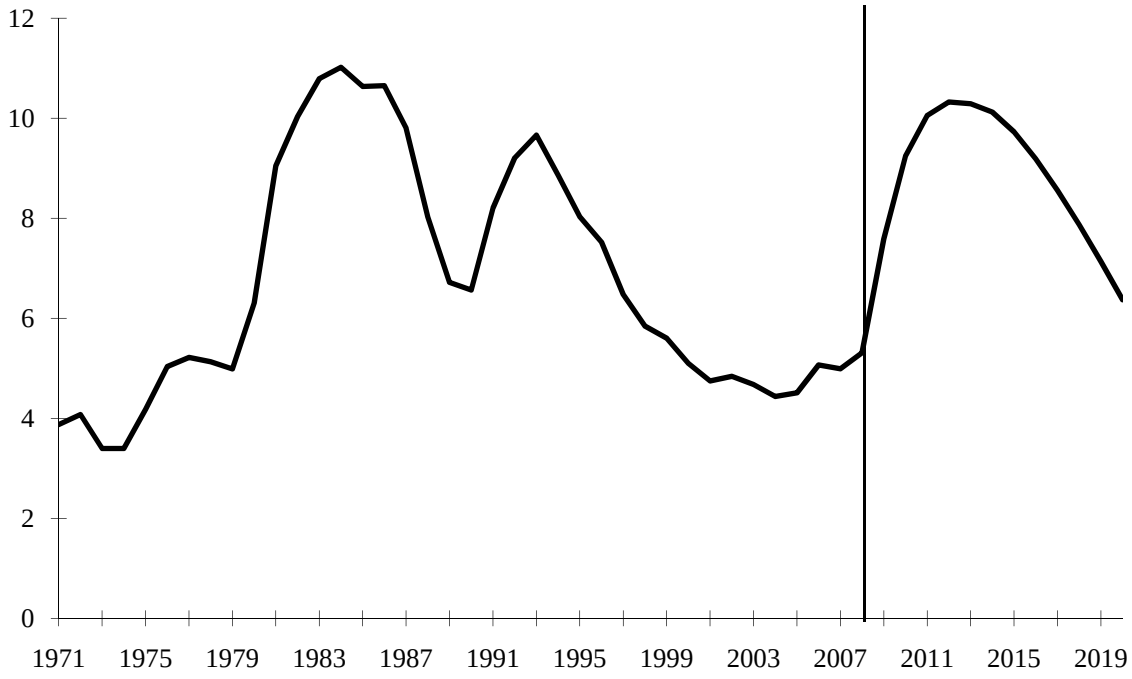


Figure 3: Balance of Payments Current Account (% GDP) base projection

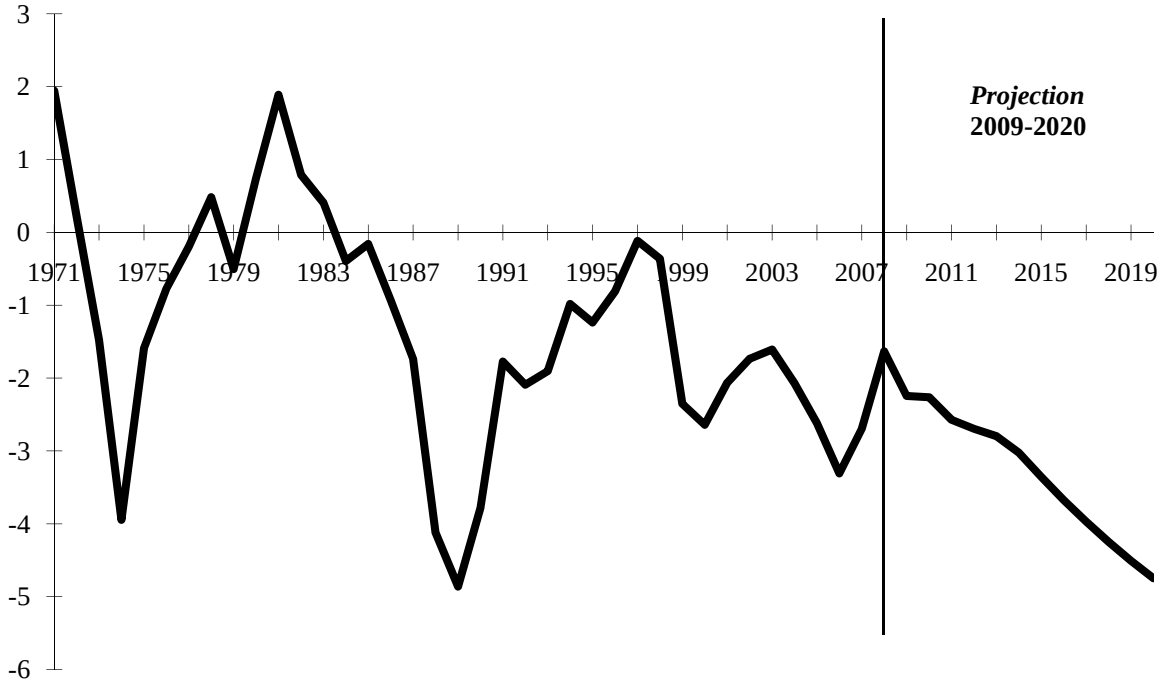


Figure 4: Components of the Current Account (% GDP) base projection

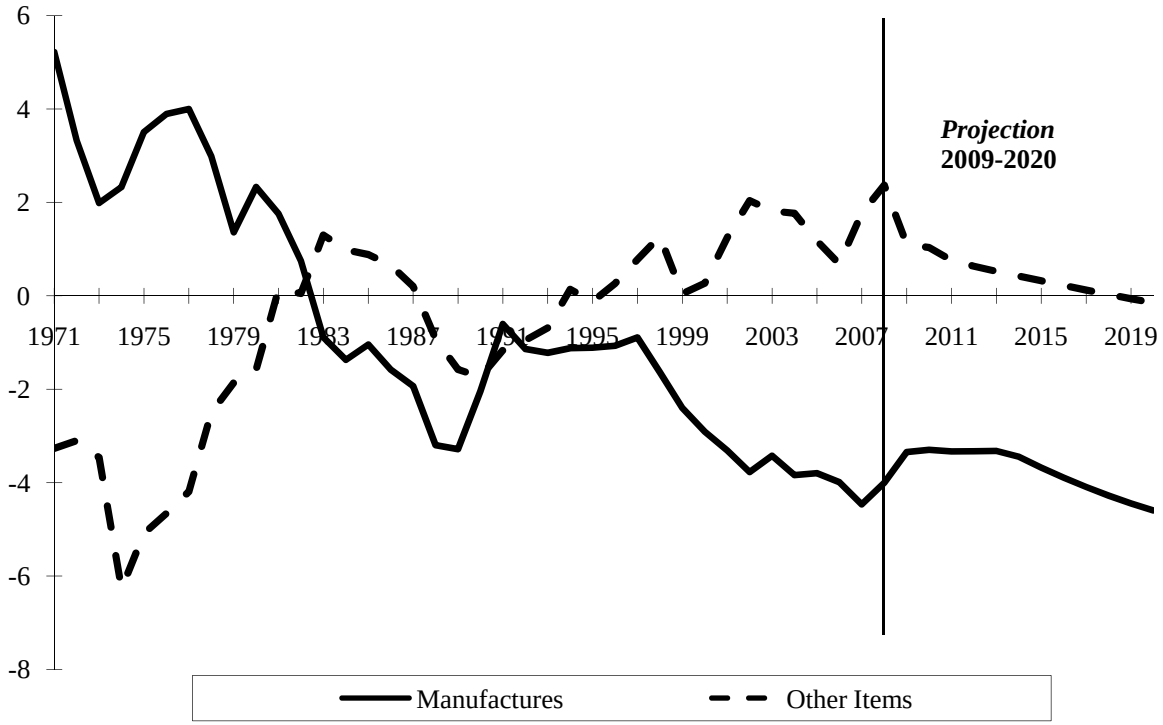


Figure 5: Balance of Trade in Energy, Food & Basic Materials (% GDP) base projection

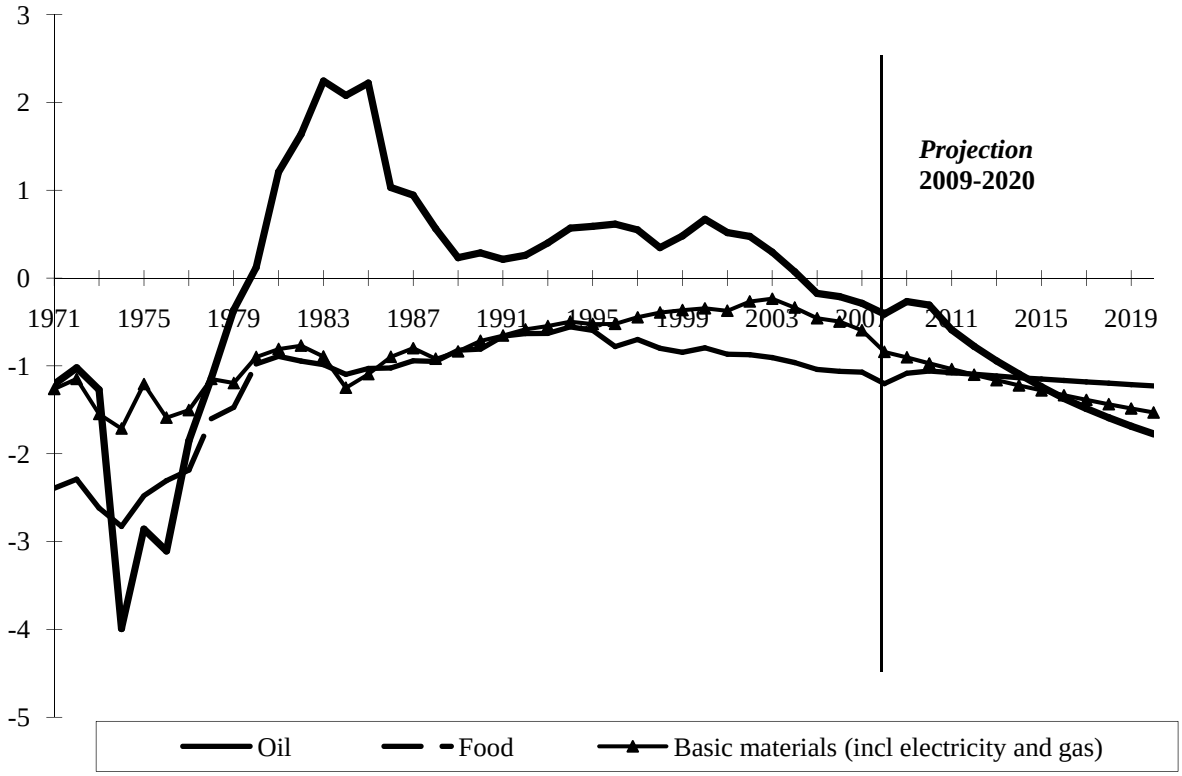


Figure 6: Net Investment Income (% GDP) base projection

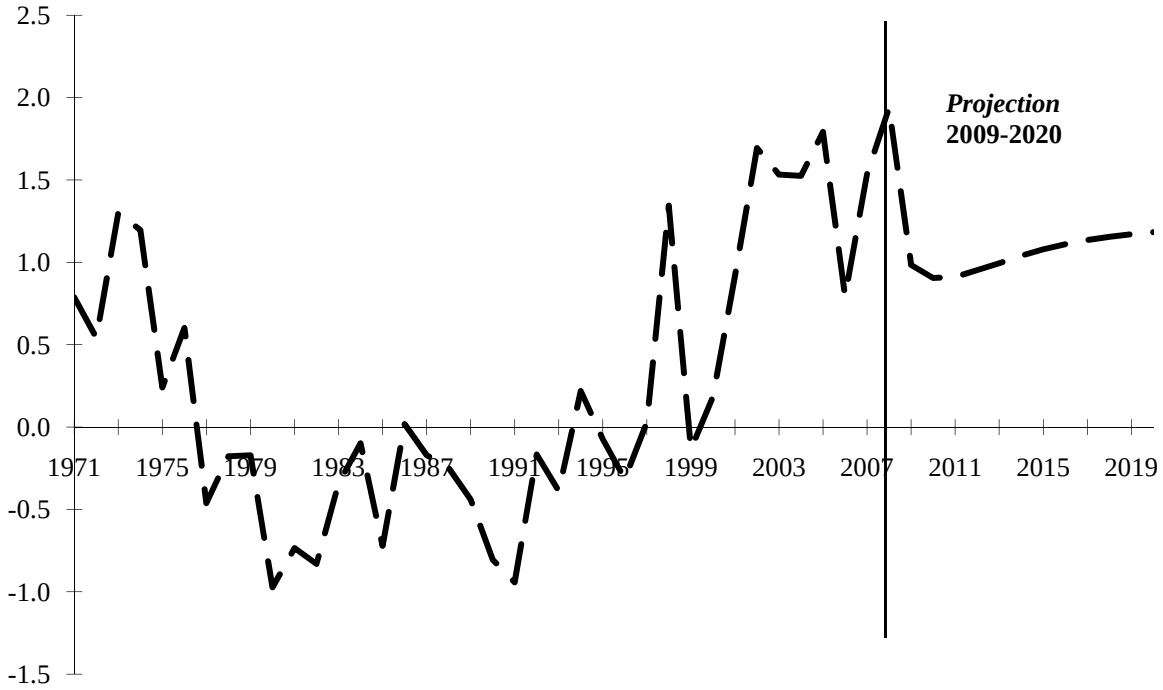
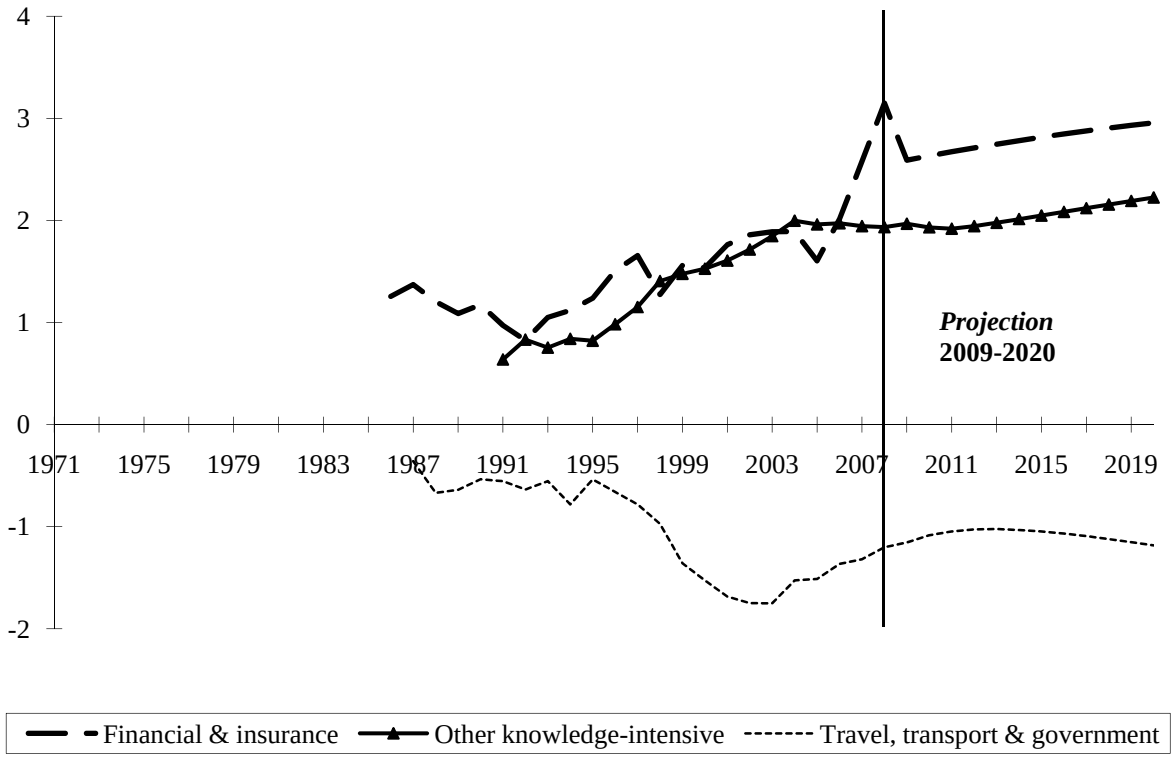


Figure 7: Balance of Trade in Selected Services (% GDP) base projection



Base Projection: Sensitivity Analysis

The above is a rather gloomy picture. After a decade of economic recovery and growth, the unemployment rate is approaching its pre-crisis level. However, there is a large current account deficit equal to almost 5% of GDP. A deficit of this magnitude has been observed only once before in the modern era, for a brief period in 1989. The base projection will almost certainly be wrong, but the interesting questions are how wrong and for what reason?

When projecting the future balance of payments what matters is not just the growth rate of any particular item, but also its initial size. The two largest items by a long way are manufactured goods and income from overseas investment (Table 1). Despite all the changes that have occurred, manufactured exports are still three times as large as the total export earnings of the entire City of London or of the whole gamut of other knowledge-intensive services. An instant ten percent rise in manufactured exports combined with a similar fall in manufactured imports would generate a £45 billion improvement in the balance of payments, which is more than UK net earnings from financial services and insurance. An instant ten percent reduction in the amount of investment income we receive combined with a ten percent increase in what we pay out, would lead to a net loss of £50 billion. These are huge figures. They are similar in magnitude to what our imports of fuels would cost if North Sea oil dried up overnight and energy prices returned to their peak value of 2008.

Table 3: Individual changes that improve the current account by 1% of GDP by 2020

	BASE PROJECTION	NEW ASSUMPTION
Real competitiveness (relative unit labour costs) change	0	-12.5%
Real oil price increase	+2.5% p.a.	-3.5% p.a.
Volume of oil production change	-7% p.a.	-2.7% p.a.
Growth of domestic spending (implied unemployment rate 2.3 percentage points above base projection in 2020)	3% p.a.	2.35% p.a.
Growth of world trade	5% p.a.	6.5% p.a.

Long-term real return on UK overseas assets	1.9% p.a.	2.3% p.a.
Average growth of real net exports of financial and insurance services (28% above base projection by 2020)*	0.1% p.a.	2.4% p.a.
Average growth of real net exports of other knowledge-intensive (35% above base projection by 2020)*	1.8% p.a.	4.1% p.a.
Average growth of manufactured exports (9.5% above base projection by 2020)**	4.8% p.a.	5.7% p.a.

NOTE: CALCULATED BY MODIFYING THE RELEVANT ASSUMPTION IN THE BASE PROJECTION. EACH MODIFICATION LEADS TO A 1% OF GDP IMPROVEMENT IN THE BALANCE OF PAYMENTS ON CURRENT ACCOUNT BY 2020. *REAL QUANTITIES ARE DERIVED BY DEFLATING NOMINAL QUANTITIES BY THE GDP DEFLATOR. **VOLUME INDEX DERIVED BY DEFLATING NOMINAL EXPORTS BY THE PRICE DEFLATOR FOR MANUFACTURED EXPORTS; TAKES INTO ACCOUNT THE FACT THAT AN INCREASE IN MANUFACTURED EXPORTS INDUCES MORE IMPORTS.

Table 3 provides further information on this issue. It shows how sensitive our overall balance of payments projection is to unforeseen shocks or variations in the assumptions which underlie the base projection. It lists a number of changes that would individually cause an improvement in the current account balance in 2020 equal to 1% of GDP. These are as follows:

- *Domestic Demand.* The base projection assumes that domestic spending grows at 3.0% p.a. If spending were to grow at 2.35% p.a. instead, this would eventually reduce the balance of payments deficit by 1% of GDP. Because of the slower growth in demand the unemployment rate in 2020 would be 2.3 percentage points (800,000) higher than under the base projection. In human terms expenditure restraint is a costly way of preserving national solvency.

- *Devaluation*. The base projection assumes that the real exchange rate remains constant throughout the projection period. A permanent devaluation of 12.5% would eventually improve the balance of payments by 1% of GDP. This devaluation would be on top of the large currency devaluations that have already occurred during 2007-08.

- *World Trade.* The base projection assumes that world trade grows by 5% p.a. If it were to grow instead by 6.5% p.a., this would produce the required improvement in the balance of payments.

- *Real Oil Price.* The base projection assumes that the real oil price increases by 2.5% a year. To produce the required improvement in the balance of payments would require the real oil price to *fall* by an average of 3.5% p.a. over the entire projection period. This is conceivable, but unlikely.

- *UK Oil Production.* The base projection assumes, optimistically, that UK oil production will fall by 7% p.a. To generate the required improvement in the balance of payments would require oil production to fall by only 2.7% a year. In 2020 the UK would still be producing almost three quarters as much oil as in 2008. This is a remote possibility.

- *Return on overseas assets.* An increase of 0.4 percentage points on UK investments abroad would generate an additional net income in 2020 equal to 1% of GDP. This calculation assumes there is no change in the return that foreigners obtain on their investments in the UK. Such a positive shock cannot be ruled out, although neither can a shock in the opposite direction. The future behaviour of net investment income is highly uncertain.

- *Financial and Insurance Services.* An additional 28% in net export earnings from this sector by 2020 would be equivalent to 1% of GDP. This would be an impressive achievement.

- *Other knowledge-intensive services*. An additional 35% in net earnings from other knowledge-intensive services by 2020 would be equivalent to 1% of GDP. To achieve this result would require such earnings to grow more than twice as fast as we envisage under the base projection. This is unlikely.

- *Manufactured exports*. An additional 9.5% in manufactured exports would improve the current account by 1% of GDP in 2020. This calculation takes into account the fact that manufactured exports have a high import content.

If all or most of the above changes to the base projection were to occur simultaneously, then by 2020 the UK would enjoy a current account surplus. Conversely, if similar changes were to occur simultaneously in the opposite direction, there would be a gigantic current account deficit. The above calculations illustrate the sensitivity of our projections to two particular items: investment income and manufacturing trade. As Table 1 indicates, these are very large items and relatively small proportionate errors in projecting their behaviour will have a substantial impact on the balance of payments. This is not the case for most of the other items in the balance of payments, which are mostly much smaller in magnitude.

Discussion

The base projection represents our best estimate of what will happen over the next decade if present trends continue. It paints a rather gloomy picture. By 2020, the unemployment rate is almost back to its pre-crisis level. However, the projected current account deficit is almost 5% of GDP. Excluding investment income, the deficit is almost 6%. Do deficits of this magnitude matter? Most economists agree that countries cannot run large current account deficits forever, because of the resulting growth of foreign debt; sooner or later some form of adjustment will be required. The question is how large is large and how painful will the eventual adjustment be? C. Fred Bergsten (2002) has argued that "research at both the Federal Reserve Board and the Institute for International Economics reveals that industrial countries, including the United States, enter a danger zone of current account unsustainability when their deficits reach 4–5 percent of GDP... At these levels, corrective forces tend to arise either spontaneously from market forces or by policy action." More recent research by Clarida *et al* (2007) reaches the same conclusion. In their econometric analysis of industrial countries, Freund and Warnock (2007) find that deficit adjustment typically involves a decrease in GDP growth and may involve currency depreciation. They also find that larger deficits take longer to adjust and are associated with significantly slower output growth (relative to trend) during the current account recovery than smaller deficits. These various findings suggest that deficits on the scale we project are a cause for concern. If our projection turns out to be correct there may eventually be a painful adjustment involving loss of output and rising unemployment.

As we have stressed throughout this paper, there is a great deal of uncertainty in forecasting over such a long time period. However, there are grounds for believing that underlying trends are moving against the UK. Imports of energy are almost certain to rise considerably as UK oil production falls, and the cost of imported energy, food and basic materials are also likely to increase. This would not matter if there were offsetting improvements elsewhere in the balance of payments. As things stand at the moment, it is difficult to see where the required improvements would come from. The base projection takes a rather optimistic view of the service sector, yet as a proportion of GDP the overall trade balance in services is only a little greater in 2020 than it was at the start of the period in 2008. Net income from investment falls under this projection and, after an initial improvement, the trade deficit in manufactures gets larger.

The relentless deterioration in the balance of payments that occurs under the base projection is not sustainable. Some of the trends are beyond our control, but there are at least three important areas where government policy could make a difference. These are: the City of London, manufacturing and other

knowledge-intensive services. As far as the City is concerned, future reform of the financial sector should be designed so as to contribute to the export potential of this sector. In the case of manufacturing and knowledge-intensive services, there is scope for what might be loosely called an “industrial policy”. This is now coming back into fashion, although what it would mean in practice is at present rather vague and subject to debate. There is also the exchange rate to consider. The big devaluation that occurred in 2007-08 has given UK exporters an advantage and the government should aim to preserve this advantage by pursuing appropriate monetary and fiscal policies. Indeed, to the extent that it is feasible, there is a case for engineering a further sterling devaluation.

Given the orders of magnitude involved, any policy for dealing with the emerging balance of payments deficit must assign a central role to manufacturing. The scale of UK trade in manufactures is, and will remain for years to come, several times larger than the exports of the City of London and all knowledge-intensive services put together. Safeguarding the City and increasing knowledge-intensive exports are both important objectives, but success in these areas would not remove the need to improve the trade performance of the manufacturing sector.

The opposition between manufacturing and services is to some extent a false one. In a modern economy like ours, the dividing line between manufacturing and services is becoming increasingly blurred. Many manufacturing firms rely heavily on knowledge-intensive services provided by outside suppliers, whereas some manufacturing firms are also major service providers in their own right. It would be difficult to conceive of a viable industrial policy for manufacturing that did not also involve knowledge-intensive services. With a stronger manufacturing sector, there would be a larger internal market for manufacturing-related services, and access to this market would enable UK service providers to benefit from economies of scale and develop skills which can be exploited in export markets.

There is a precautionary motive for policies to strengthen the balance of payments. Our projections are surrounded by a great deal of uncertainty and, although things could turn out better than we project, there is a fair chance they could turn out significantly worse. Simply on grounds of prudence there is a case for industrial and other policies designed boost UK trade performance.

Appendix: Sources and Methods

Our model is a convenient information system for making alternative conditional projections of the balance of payments, its main components and some macroeconomic aggregates of the UK Economy.

Table A1: The Balance of Payments and its main components

	CURRENT ACCOUNT (FLOWS)
1. Visible Trade	
	Food, beverages and tobacco
	Oil
	Basic materials and other energy
	Manufactures
2. Invisible Trade	
	Traditional services[1]
	Knowledge-intensive services[2]
	Financial services[3]
3. Income	
	Investment income (credits and debits)
	Net current transfers and remittances
	Capital and Financial Account
	Transactions in real and financial assets and liabilities[4]
	Net capital transfers
	International Investment Position (Stocks)
	Balance sheets: assets and liabilities

[1] Transportation, travel and government services
[2] Communications, construction computer and information technology, royalties and licence fees, other business, personal cultural and recreational, communications.
[3] Finance and insurance ("The City").
[4] Direct investment, portfolio investment and other financial securities.

Visible trade is divided into four categories. Trade in oil includes crude oil and petroleum products, but other energy products are allocated to basic materials. Trade in services has been divided into three groups. The Traditional Services balance, which includes sea and air transport and travel (tourism), has long been in deficit. Knowledge-intensive services cover a wide range of activities and have made a growing contribution to net service exports. The balance of Financial Services (including insurance) is the other large surplus component of trade in services. Investment income is the aggregate of direct investment, portfolio investment and other securities, divided into the banking and non-banking sectors. The remaining category is net current transfers and compensation of employees (remittances). The balance of all these transactions is the balance of payments on current account.

Purchases and sales of assets and liabilities provide the link between the current account and the balance sheet. We distinguish between the banking and non-banking sectors in the flows of capital and in the (end-year) stocks of assets and liabilities of domestic residents with overseas residents. All the balance of payments data comes from the Office for National Statistics Pink Book (United Kingdom Balance of Payments: 2008 Edition), supplemented by trade statistics and quarterly balance of payments data. The balance of payments analysis is linked to major macroeconomics aggregates such as GDP and employment. National accounts aggregates come from United Kingdom National Accounts: the Blue Book, 2008 Edition, supplemented by quarterly national accounts. Employment and other labour market data come from Labour Market Statistics, published by the Office for National Statistics (ONS). All the data is available from the ONS web site url: http://www.statistics.gov.uk/.

Model structure and properties

Table A2

ENDOGENOUS VARIABLES	*64*			
of which:				
	identities	49	inexact equations	15
EXOGENOUS VARIABLES	**26**			
Total	90			

Since there are 90 variables in the model and 64 independent equations relating to subsets of these variables, we can treat 26 variables as exogenous, i.e. not "explained" by the model. A projection is a solution of the 64 endogenous variables for each year of the projection period, conditional on assumptions about the exogenous variables (a time-path for each exogenous variable over the projection period).

Most of the structure of the model consists of accounting identities relating to the various components of the balance of payments. The inexact equations summarise behavioural relationships over the historic period from 1971-2008 and include a residual between the actual historical value of the endogenous variable and the value calculated from the equation. For the projection period we must make assumptions about the future value of the residual. A common assumption is to project the last observed residual in 2008 so that there is a smooth transition from the 2008 value of the variable to its forecast value for 2009 and beyond. Of the 15 inexact equations, there are 12 equations for which we can establish reasonably stable long-run relationships; they include trade volumes, trade prices, the domestic expenditure deflator and employment. For the remaining equations (which include net financial services) we have been unable to explain past behaviour satisfactorily in any systematic way. These variables are projected on the basis of historic trends and assumptions about the residuals.

Exogenous variables

The principal exogenous variables in the conditional forecasts divide into six groups. They are: the volume of domestic expenditure; the index of wages and salaries per unit of output; the nominal exchange rate and relative unit labour costs; the price and volume of oil; the world demand for manufactured goods; the real returns on external assets and liabilities. Our "base projection" assumptions are summarised in Table 2. The sensitivity analysis summarised in Table 3 is obtained by calculating alternative solutions of the model to vary the exogenous variables by the amounts required to achieve a 1% of GDP improvement in the current account. For this exercise, the current account is "the target" and the exogenous variable is "the instrument".

PRINCIPAL BEHAVIOURAL RELATIONSHIPS

Export and import volumes of manufactures depend upon income and relative cost elasticities. Export volumes are related to an index of the volume of world

demand for manufactures, weighted by the UK share in each market. The series is derived from OECD *Economic Outlook*, 2009, Annex Table 53. Import volumes depend both upon the volume domestic expenditure and the volume of exports, so that faster export growth draws in more imports of manufactures. Exports and imports both depend on an index of normalised relative unit labour costs expressed in common currency, published in IMF *Financial Statistics*. Changes in the real exchange rate (as measured by the IMF normalised relative unit labour cost index) gradually affect trade volumes, so that the full effect of devaluation on the volume of exports or imports takes about four years to complete. Trade prices depend upon the domestic price index and relative unit labour costs. Our measure of inflation is based on the domestic expenditure deflator, which depends on unit wage and salary costs and import prices. The equation has the long-run property that when unit wage costs and import prices are growing at the same rate, domestic inflation is also growing at this rate.

Investment income is projected on assumptions about real rates of return on assets and liabilities and on capital gains or losses on the stocks of assets and liabilities. The current account balance then determines changes in the net stock of external assets.

Employment depends on GDP and a trend to capture long-run productivity growth associated with technical progress. The long-run employment to output elasticity is close to unity, but employment adjusts with a lag to output changes, so that short-run productivity is strongly pro-cyclical. The workforce is exogenous and unemployment is derived from the projection for employment and the workforce.

Notes

[1] See Rowthorn and Wells (1987).

[2] The members of the group were Alan Hughes, Ken Coutts, Andy Cosh and Robert Rowthorn. Publications of the group include: Cosh, Hughes and Rowthorn (1993, 1994) and Cosh, Coutts and Hughes (1996).

[3] The econometric work for this projection was done by Ken Coutts.

[4] For most of the period since 1971 the balance of trade in manufactures has steadily deteriorated. The two major exceptions, 1990-95 and 2007-2008 were both episodes where major recessions occurred combined with real devaluation of the exchange rate.

[5] UK net investment income is income credits *minus* income debits. If foreign banks operating in London lose money, this counts as a negative debit and has the effect of increasing UK *net* income. Net investment income from *direct* investment is also difficult to interpret, because measurement conventions regarding the finance of direct investment affect what gets counted as income from direct investment. See Coutts, Glyn and Rowthorn (2007).

[6] For further information on our projections see Rowthorn (2009).

[7] Ken Coutts has once again done the modelling and econometric work,

[8] The projections rely on an assessment, based on past relationships, of the main macroeconomic factors (such as income and relative prices) that influence the long-term trends in the balance of payments. See the Appendix.

[9] The impact of the crisis on the financial sector as a whole is discussed in Weale (2009).

[10] HM Treasury (2009b) paragraph B92. Official statistics for the first half of 2009 are consistent with this assumption (ONS 2009b, table B).

[11] The UK has a surplus on high paying direct investment and a deficit on other types of investment. The country gains by borrowing cheap and lending dear. For information on rates of return on different kinds of asset and liability see ONS (2009a), figures 1.8 and 1.9.

[12] DTI(2007), p 109, Figure 4.2

[13] Following a detailed assessment of global reserves, the International Energy Association now believes that world oil production could peak as early as 2020 (Birol, 2009). Future oil and mineral prices are discussed in Adams (2009) and Kesler (2007) respectively. Appendix 1.1 of IMF (2009) considers medium-term commodity market prospects.

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