Why are UK imports so cyclical?

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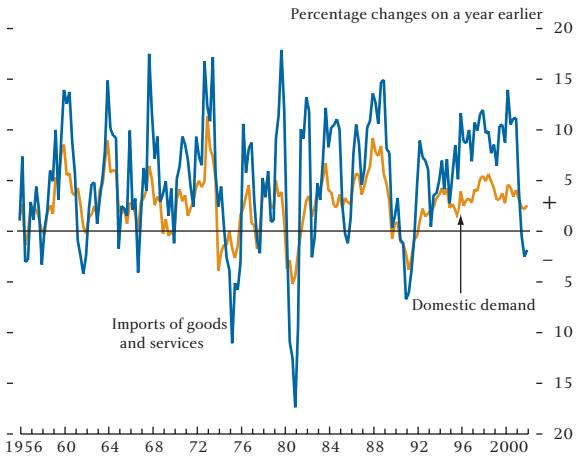
The recent economic slowdown in the United Kingdom has been characterised by declines in business investment and exports. The impact on domestic output has been alleviated by robust household spending, but also by a sharp decline in imports of goods and services. This article shows that these divergent trends in the components of demand, and differences in their import content, can help explain the weakness in imports during 2001. More generally, close attention to the relative contribution of the components to aggregate demand can help explain fluctuations in imports. The analysis has been aided by the recent publication of updated information from the ONS on the import content of different expenditure categories.

Introduction and summary

Economic conditions in the United Kingdom have recently been characterised by a moderate slowdown in domestic demand growth, coinciding with a much sharper decline in import volumes of goods and services. Chart 1 suggests that this is not a unique experience, as imports have generally been more cyclical than domestic demand.

Chart 1
UK domestic demand and import volumes



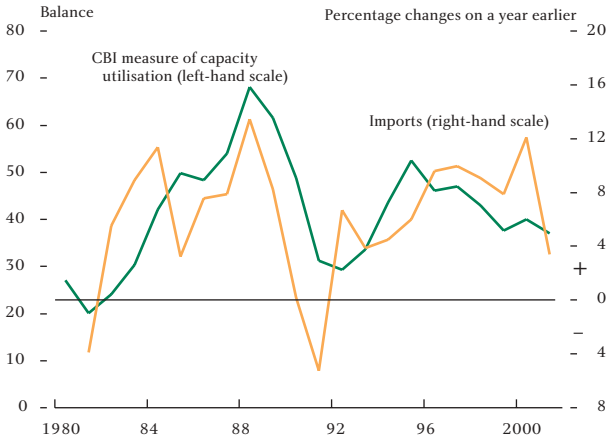
In this article we show that individual components of demand differ in the extent to which they fluctuate over the economic cycle, and in their import content. So examining the strength of different components of demand helps the assessment of prospects for imports. In particular, we demonstrate that imports have been particularly weak recently because the slowdown in demand has been disproportionately concentrated in domestic corporate expenditure and in exports, demand components that have a relatively high import content.

The cyclicality of different components of demand

Imports are more cyclical than domestic demand, in part because domestic producers may face costs in rapid adjustment of output, so that increases in demand are initially met disproportionately from overseas suppliers. Indeed the Confederation of British Industries' (CBI) survey measure of capacity utilisation for manufacturing firms has tracked growth in goods import volumes reasonably well over the past 20 years (see Chart 2). This feature is captured in the Bank's medium-term macroeconomic model (MTMM): in response to an increase in domestic demand, imports rise by almost twice as much in the short run as they do in the long run.

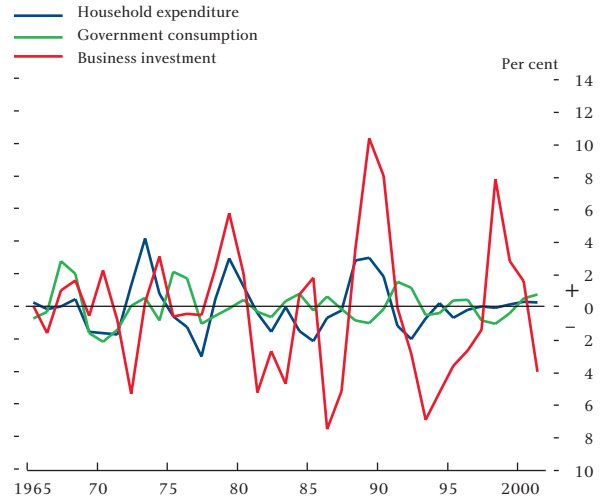
But imports may also be more cyclical than aggregate domestic spending because some components of demand vary more than others over the cycle. Chart 3 shows that deviations from trend are far greater for business investment than for aggregate household consumption or government expenditure. This matters because there are differences in the import content of these demand components, as will be discussed below.

Chart 2
Capacity utilisation and imports of goods



Sources: ONS and CBI.

Chart 3
Deviations from trend(a)



Source: Bank of England estimates.

(a) Estimated using the Hodrick-Prescott filter.

The import content of different components of demand

Information on import content is available from the input-output tables published by the ONS, see Table A. The latest figures, for 1995, were published in May 2002. These data give an estimate of the imports required, directly and indirectly, to generate a given amount of final demand. So, to take the example of consumption, that would include both the consumption goods that are directly imported, and the imports required as inputs to domestically produced consumption goods.

There is a wide variation in the import content of different demand components. That reflects the different types of goods and services purchased by households, business and the government, and the extent to which they are tradable. For example in 1995

Table A
Import content of UK final expenditure

Per cent

Expenditure component	Import content in 1990	Import content in 1995
Household consumption	20.3	20.3
Government consumption	13.2	11.5
Whole-economy investment	31.8	35.9
Changes in inventories	73.9	45.6
Domestic demand	20.9	21.3
Exports of goods and services	22.4	26.0

Source: ONS input-output tables for 1990 and 1995.

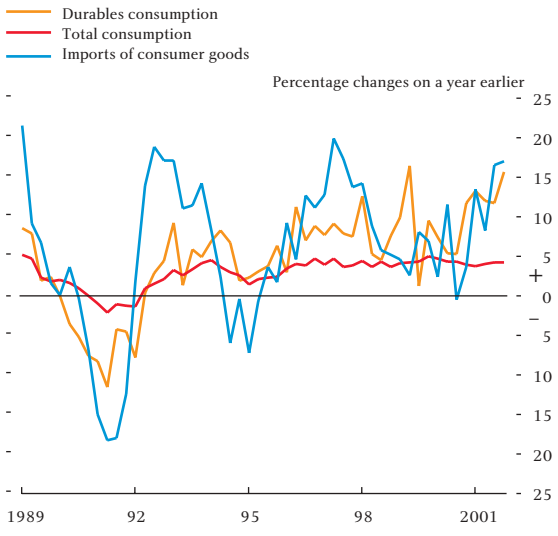
government consumption had an import content of around 12%, which meant that government consumption of £1 million required £120,000 worth of imports. That contrasts with inventories, where spending of £1 million gave rise to £460,000 worth of imports. Between 1990 and 1995 there was an increase in the import content of investment and exports, approximately offset by a decline in the import content of government consumption and expenditure on inventories.

Of course these numbers represent only two snapshots of the economy. The marginal response of imports to changes in several demand components may differ over time from that indicated in the table—depending, for example, on the degree of spare capacity in the domestic economy.

Household consumption

The import content of household expenditure is not particularly high. That reflects the fact that around one half of household expenditure is on services, many of which are not traded. While disaggregated import content data for consumption are not available, consumption of durable goods, which accounts for

Chart 4
Total consumption, consumption of durables, and imports of consumer goods



around 15% of consumption, is likely to have a much higher import content. Chart 4 illustrates the correlation between consumer goods imports and durables consumption, which supports that point.

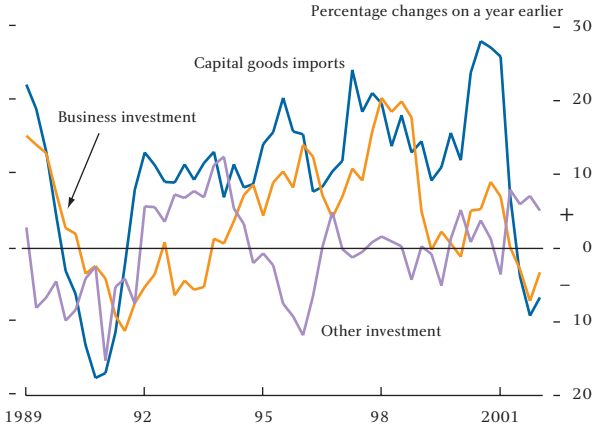
Government spending

Government consumption appears to be the component of demand that has the lowest import content. That reflects the fact that much of government spending is on the procurement of domestically provided services such as healthcare, education and law and order. Import content data are not separately available for government investment, but it is unlikely to be as high as the figure for whole-economy investment quoted in Table A, as government investment tends to include mainly construction work.

Business investment

The trade data indicate that consumer and capital goods account for broadly similar proportions of total imports, whereas investment spending is only equivalent to around one third of household consumption. So it is not surprising that input-output tables indicate a much higher import content for investment than for consumption. The import content figure in the input-output tables (see Table A) is for whole-economy investment—that is, investment by government, business and by the household sector (in dwellings). The import content of business investment, which tends to be focused on machinery and equipment, is likely to be higher than that. As Chart 5 shows, imports of capital goods correlate more closely with business investment than with investment by other sectors of the economy.

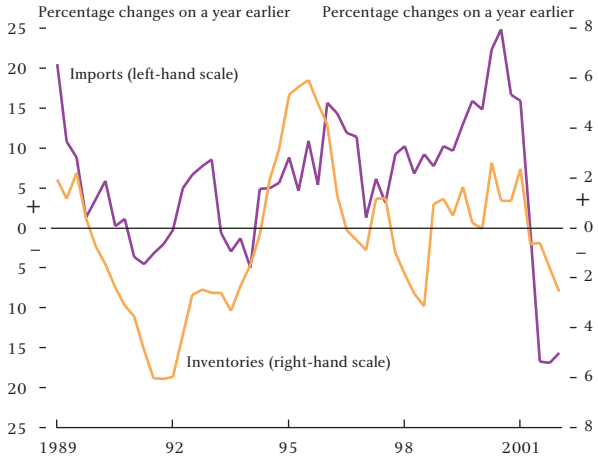
Chart 5
Imports of capital goods, business investment and other investment



Inventories

Manufacturers' inventories consist of materials and fuel, work in progress and finished goods to an approximately equal extent. But quarterly expenditure on inventories is the most volatile component of aggregate demand, and expenditure each period is unevenly distributed across the different types of inventories. So the snapshot of its import content in a particular year may not be as generally applicable as it might be for other components of demand. The input-output tables provide some evidence for that, as the import content was very different in 1990 and 1995. Some fluctuation in inventory expenditure is involuntary, reflecting unanticipated changes in final demand relative to supply, and these would not have any immediate counterpart in the import data. So, as shown in Chart 6, while there is a relationship between manufacturers' inventories and imports of materials, fuels, and intermediate goods, it is not a very close one. The decline in manufacturers' inventories during 2001 contributed to the weakness in import volumes.

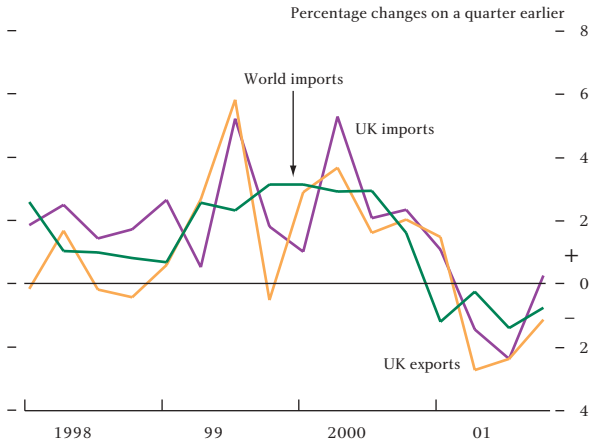
Chart 6
Manufacturers' inventories and imports of intermediate goods, basic materials, and fuels



Exports

As UK export growth slowed in response to slower growth in world demand, the impact on net UK trade was mitigated by lower import volumes (see Chart 7). A contributory factor to that development may have been the above-average import intensity of exports. This can be partly explained by international production links: because of declining transport costs, it is profitable for firms to locate the various stages of the production process in different countries. A product can cross the border several times before reaching the final customer,

Chart 7
UK trade and world import volumes

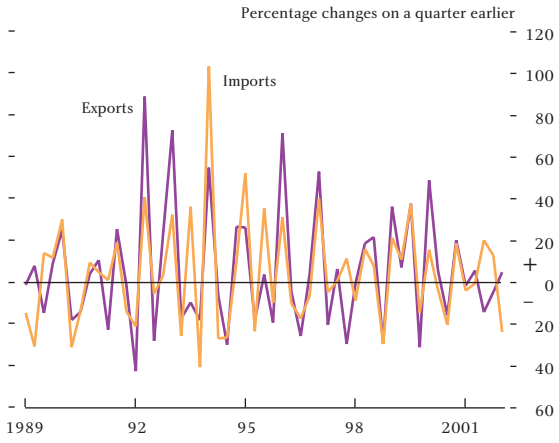


Sources: ONS and Bank of England.

generating trade flows as it does so. Scope for this is greater for products high in value relative to their weight, for example high-technology goods, and those subject to a number of processes.

Some goods may also only be in transit, with little value added in the United Kingdom. In part, that could reflect London's historical role as a trading centre for goods like precious stones or commodities: imports of precious stones and silver correlate highly with exports in the same quarter (see Chart 8). Though at times this may account for a considerable share of movements in total exports and imports, these 'erratic' items account for only a small share of trade on average (around 3%). So this cannot explain the overall important links between imports and exports. But re-exporting may have become more prevalent for other products too: improved technology and lower transport costs may have encouraged the use of international distribution centres, thereby encouraging such trade flows.

Chart 8
Trade volumes of precious stones and silver



A disaggregated model of imports

In many macroeconomic models, imports are modelled as a function of aggregate demand and relative prices. In effect, that assumes that the import content of each demand component is the same, though Table B indicates that in practice they are not. And it cannot allow for the different cyclical profiles of demand components. Drawing together the implications of cyclicality and import content, it is evident that the components of demand that tend to be more cyclical, such as business investment and inventory expenditure, also tend to have higher import contents. So a disaggregation of the demand components may help to explain movements in imports more accurately.

Input-output data on import content give an indication of the amount in £ million by which imports would change for a given £ million change in demand. But when modelling the impact of fluctuations in demand on imports, the responses in percentage terms are often more interesting. That is, by what percentage would total imports change for a 1% change in one of the demand components—the elasticity of imports with respect to demand. This can be calculated by combining information on the import content with the average size of the different demand components relative to total imports. That is shown in Table B below.

Table B
Implied elasticities of imports with respect to demand components

Expenditure component	(1) Import content (per cent) (a)	(2) Ratio to total imports (b)	(3) Implied long-run elasticity (c)
Household consumption	20.3	2.4	0.5
Government consumption	12.4	0.8	0.1
Whole-economy investment	33.9	0.6	0.2
Changes in inventories	59.8	0.0	0.0
Domestic demand	21.1	3.8	0.8
Exports of goods and services	24.1	1.0	0.2

Sources: ONS input-output tables for 1990 and 1995 and Bank of England.

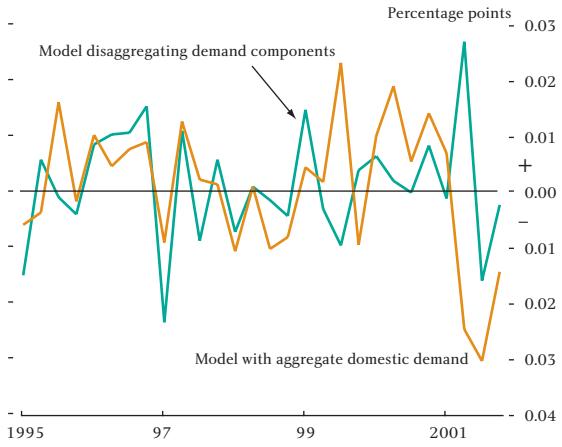
(a) Average of 1990 and 1995 input-output tables.
(b) Average over period 1980–2001.
(c) Column **(3)** is equal to column **(1)** multiplied by **(2)** and the components sum to one. Note that this analysis assumes that industry output can be represented as a linear combination of its inputs.

Take the example of consumption: averaging the information in the 1990 and 1995 input-output tables, the import content of consumption is 20%. Averaging over a long time period, consumption is about two and a half times as large as total imports. So the implied long-run elasticity of total imports with respect to consumption is 0.5. This can be interpreted as a relative import share: on average, 50% of all imports are used directly and indirectly for consumption. By comparison, on average 20% of total imports are used for investment.

Even though each pound spent on consumption does not generate as much in imports as a pound spent on investment, expenditure on consumption is far greater than expenditure on investment. The short-run elasticity of imports with respect to the different demand components is likely to be larger than the long-run effect, because domestic capacity constraints mean that it can be some time before domestic sources of supply can satisfy higher demand. And the extent of the difference between short and long-run impacts is likely to vary between demand components depending on their cyclical profile.

Chart 9 shows the residuals, or unexplained movements in import volumes, from two different estimated relationships. One takes a traditional approach where there is a single aggregate demand variable, domestic demand. The other separates out the effects of different demand components, including exports. The disaggregated relationship is better able to explain fluctuations in import volumes in the recent past, when the residual has on average been closer to zero. In contrast, imports were stronger than the simple relationship predicted in 2000, but weaker than predicted in 2001. The difference between the explanatory power of the two models is less obvious in earlier years, when the divergence between trends in world trade, corporate sector and household spending was not as great. For more details on the equations estimated see the appendix.

Chart 9
Residuals of import volume equations



Source: Bank of England.

Conclusion

This article discussed the extent to which movements in the various components of domestic demand and exports can explain fluctuations in UK imports of goods and services. For example, business expenditure on capital goods and inventories is particularly cyclical and contains a relatively large proportion of imports, as do exports. Changes in these demand components can therefore have larger effects on total imports than would be expected based on their share in total final expenditure. Indeed, the unusually pronounced decline in imports in 2001, relative to aggregate domestic demand growth, seems to reflect the combined effects of the world slowdown and the weakness of UK corporate sector spending on capital goods and inventories. Looking forward, as the composition of demand growth shifts from the private to the public sector, growth in import volumes might be weaker than would be projected from looking at simple aggregate relationships.

Appendix

The following equation was estimated:

$$\Delta m_t = \alpha + \beta \Delta c_t + \chi \Delta ib_t + \delta \Delta g_t + \phi \Delta inven_t + \psi \Delta x_t + \theta\ (m_{t-1} - tfe_{t-1} + \gamma\ rxrm_{t-1} - \rho\ spec_{t-1})$$

m, c, ib, g, inven and *x* stand for total imports of goods and services, household consumption, business investment, government spending (consumption and investment), inventory expenditure and exports of goods and services, and *tfe*, *rxrm*, and *spec* stand for total final expenditure (with expenditure components weighted together using information on import content), the price of imports relative to domestic prices, and trade specialisation—measured as the world trade to world GDP ratio. Δ denotes the one-quarter change. All variables except *inven* and *spec* are in natural logarithms.

The explanatory power of this equation is compared in Chart 9 with a much simpler form of import volume equation, where imports are only a function of aggregate domestic demand, relative prices and trade specialisation.

Note that the estimated short-run responses for the demand components are much larger than the long-run elasticities. That divergence is particularly marked for exports, which is consistent with the observation that some commodities are imported and then exported again during the same quarter.

Table 1
Estimated coefficients in disaggregated import volume equation

Short run	Coefficient	*t*-value
c	0.84	3.9
ib	0.29	5.7
g	0.25	1.7
inven	1.07e–0.5	6.3
x	0.62	7.0
Long run		
Error correction term (θ)	-0.18	-3.7
rxrm	0.46	2.1
spec	0.47	2.6
Weighted *tfe* (a)	1.00	
Adjusted R^2	0.68	
Standard error of equation	0.02	
Durbin Watson	2.17	
Sample period	1980–2001	

(a) *Tfe* = (0.5*Household consumption + 0.2*Investment + 0.1*Government consumption + 0.002*Inventory expenditure + 0.2*Exports).