

**Ireland's Exposure to a Sterling Shock**

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## **Executive Summary**

### **Objective of the Study**

In 1996 as part of its study on the economic implications for Ireland of EMU, the ESRI examined the impact of sterling shocks on the Irish economy. The decision of the UK to opt out of EMU means the Irish economy is still exposed to an asymmetric shock from changes in the valuation of the UK currency. By its very nature a shock is unanticipated. However, the Irish economy has experienced rapid growth since 1996/97 and the structure of the economy has changed. As a result, it is timely to consider how these changes affect Ireland's vulnerability to sterling shocks today. As in the case of the original 1996 study, because of the openness of the UK economy, it is essential to consider the impact of sudden changes in sterling on the UK as well as on the Irish economy. The UK economy would not stand still in the face of such a shock and the impact on Ireland will depend on how prices and wages in the two economies change relative to one another as a result of such a shock, and also relative to third countries.

### **Sterling and the UK economy**

A sharp appreciation of sterling occurred in 1997. Between July 1996 and January 2000 the effective exchange rate rose by 26.7 per cent. Sterling has remained strong on the financial markets ever since. This appreciation has been primarily against the Dmark, (subsequently the euro) as sterling has remained broadly stable against the US dollar.

In many ways long run economic prospects depend upon the real exchange rate (nominal exchange rates adjusted for differences in price levels). Purchasing Power Parity (PPP) is the concept that national price levels should be equal when converted to a common currency. Exchange rate literature shows that, while PPP does not hold in the short run, relative PPP<sup>1</sup> does tend to hold in the very long run. Until the appreciation of sterling, the absolute price level in the UK had been below that in Ireland over the previous decade. However, OECD data indicates that the rise in sterling has resulted in the UK price level moving well above that in Ireland. While significant long-term differences between EU members in the price of services is possible over a prolonged period, such a major reversal in the overall relative price position is unlikely to be sustainable. With the single market, competition will eventually

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<sup>1</sup> Absolute PPP implies that price levels are identical across countries whereas relative PPP implies that the rates of inflation in a common currency will be similar across countries, resulting in unchanged relative prices.

erode differences in goods prices or, more likely, the value of sterling will eventually change to restore the normal relationship between price levels within the EU.

A sharp rise in UK labour costs has occurred since the appreciation of sterling in 1997. Manufacturing labour costs in the UK are now over 25 per cent higher than in Ireland. This contrasts with the situation over the last 20 years when UK costs have generally been only 5 to 10 per cent higher than Ireland. The rise in sterling has also seen a major narrowing in the gap between labour costs in Germany and the UK. Unless massive changes have taken place in the UK economy in recent years, this loss of competitiveness is unlikely to be sustained indefinitely.

The widely held view is that the UK currency is currently overvalued, although estimates of the extent of the overvaluation vary. Analysis using different methodologies, (econometric analysis by the IMF, purchasing power parity, and fundamental equilibrium exchange rates), suggest that in recent times sterling has been between 14 and 25 per cent overvalued. To date, the UK price level has not reacted to the strength of sterling. This is not out of character with past behaviour when sterling was overvalued. Firms tend to hold their prices on the UK market with the expectation that sterling will eventually adjust to restore the "equilibrium" value of the currency. On foreign markets there is evidence that UK exporters are not raising their Irish pound prices by anything like the amount that the strength of sterling would imply. Instead they are taking a major cut in profit margin to maintain market share. This behaviour by UK firms is an implicit statement that they do not see the current exchange rate as being sustainable.

The fact that sterling is significantly overvalued at current rates means that the implications of a major depreciation of sterling is likely to be very different from what it would have been if it had occurred in 1996. Such a fall today would just restore UK competitiveness to its expected long-run level whereas a fall in sterling in 1996 would have conferred a major improvement in UK competitive position compared to that experienced over the previous 20 years.

### **Previous Analysis of Sterling Shocks**

As part of an assessment of the economic implications for Ireland of EMU, the impact of a sterling shock on the Irish economy under a number of different EMU membership scenarios was considered. Of relevance to this study is the scenario where Ireland was assumed to be a member of EMU but the UK was assumed to remain out. One of the possible shocks examined was a sudden large depreciation in the value of sterling of the order of 20 per cent.

This would have brought sterling from an exchange rate of just over parity to something over GBP£1.20 per Irish pound.

In 1996 sterling was probably not far from its long-run "equilibrium" value so that any permanent change in value could have been expected to be reflected in prices and wages in both the UK and Ireland. Generally, the results indicated that while the adjustment of prices and wages in Ireland and in the UK would moderate the impact of the competitiveness loss, the traditional manufacturing sector, in particular, would have been hit by such a sudden sterling depreciation.

### **Implication Today for Ireland of a Sterling Depreciation**

We first consider a range of indicators of how the structure of the Irish economy has changed in recent years. The general import of these indicators is that the economy has become steadily less dependent on the UK.

Exposure to a sterling shock depends on the structure of the Irish economy and the behaviour of the economic agents that operate within the economy. Historically the UK has been a very important economic neighbour in terms of trade and, indeed, the labour market. However, there has been a steady decline in trade dependence, although the decline in import dependency is not as dramatic as that for exports. The EU market has become increasingly important as a destination for Irish exports. Analysis of the share of Irish trade with the US and Canada since 1975 points to an increasing export and import dependence.

As part of this study we examine employment figures for the manufacturing sectors, identified in the EMU study as being vulnerable to a sterling shock, to determine if the exposure of the manufacturing sector has changed. These data indicate that there has been a substantial decline in the share of employment in sectors that were assessed as having a high or fairly high currency risk. It is also worth noting that the sectors that had a low or very low currency exposure have increased in importance based on employment levels.

We considered three scenarios where sterling falls suddenly from its present level by 25 per cent, bringing the value of sterling roughly to parity with the Irish pound. These scenarios make different assumptions about the extent to which the Irish and UK economies have adjusted to current exchange rates:

1. We assume that prices and wages in Ireland and the UK have not adjusted to the current high level of sterling so that there is no impact on wages and prices in Ireland or the UK of a fall in sterling's value. However, such a fall would adversely affect the

competitiveness of existing firms. Because prices and wages do not adjust to offset the effects of the fall in sterling, this produces a long-lasting adverse impact on the economy and public finances.

2. Prices and wages in the UK and Ireland adjust, albeit slowly, to a sudden fall in sterling. As a result, the loss of competitiveness is temporary.
3. As in scenario one, prices and wages have not adjusted to current exchange rates but we also assume that Irish firms have not adjusted to the current favourable exchange rate. As a result, they do not suffer unduly from a sudden reversal in sterling's value.

The research evidence is not sufficiently conclusive to allow us to say exactly where the Irish and UK economies lie within the boundaries delineated by these three Scenarios. What does seem clear is that sterling is overvalued (or the euro undervalued). Price and wage levels in Ireland and the UK have not fully adjusted to the current situation. However, firms, while generally discounting the current strength of sterling, have probably built its strength into some decisions on output (e.g. vulnerable firms staying in business) or investment. Scenario 2, where prices and wages are assumed to have fully adjusted in both Ireland and the UK to the current exchange rate, is not consistent with the evidence on price levels. As a result, the most probable outcome lies somewhere between scenarios 1 and 3.

***Table: Effects of Different Shocks on the Exchequer***

	Exchequer Savings as percentage of GNP				Debt/GNP Ratio as percentage of GNP			
	Scenario 1	Scenario 2	Scenario 3	US Equity Shock	Scenario 1	Scenario 2	Scenario 3	US Equity Shock
Year 1	-0.4	-0.2	0	-1.2	0.3	0.6	0	3.4
Year 2	-0.7	0.4	0	-1.7	1.2	0.7	0	5.3
Year 5	-0.8	0.7	0	-0.1	3.2	-2.3	0	3.8

The Table shows the cumulative impact on exchequer savings and on the debt/GNP ratio of the shock to sterling. For comparative purposes we have also included the possible impact of a US equity price shock, a scenario that is described in detail in the *Medium-Term Review: 1999-2005*. The shock involving US equity prices falling by 25 per cent was assumed to have a serious impact on foreign direct investment into Ireland, triggering a collapse in Irish house prices. Such a shock would have a much greater impact on the Irish economy, and on the government sector, than would any of the sterling shock scenarios considered here.

From the point of view of the public finances the worst case scenario for a sterling fall of 25 per cent is scenario 1. However, even with such a shock the likely maximum impact on exchequer savings would be under one percentage point of GNP and the cumulative increase in the debt/GNP ratio after five years would be 3.2 percentage points. Because the most probable outcome from a sudden sterling depreciation would lie between scenarios 1 and 3, this would suggest that the public finances are not very exposed to sterling shocks. However, if the shock were sufficiently great to trigger a collapse in Irish house prices then these results would be significantly magnified.

When the results of a sterling shock under different scenarios is compared with the results from a shock to the US economy the latter would appear to be much more serious from the point of view of the economy as a whole, and the exchequer in particular. This suggests that the Irish economy, and the Irish exchequer, is now more exposed to the US economy than to shocks to sterling.

This analysis would suggest that when the likely realignment of sterling occurs, if it is not accompanied by any other shocks, the effects on the Irish economy will be unfavourable, but the magnitude of any adverse effects will be small. Thus the public finances seem likely to be reasonably robust in the face of a sterling shock taking place on its own.

## **Conclusions**

For the public sector, the scenarios examined suggested a likely initial impact on exchequer savings of under one percentage point of GNP. The maximum cumulative impact on the debt/GNP ratio after 5 years would be around 3.2 percentage points. However, these are the most extreme results, with the likely outcome being almost certainly substantially lower.

Depending on the causes of any major change in exchange rates, the Irish economy's vulnerability could be rather different. In particular, the behaviour of sterling and the dollar has been correlated in recent times. As discussed in the *Medium-Term Review*, a major shock to the US economy could have a much bigger impact on the Irish economy. In one scenario examined in the *Review* exchequer savings were reduced by something under a half a percentage point of GNP for every one percentage point reduction in growth consequent on a disruption of the US economy.

If such a shock to the US caused a major sterling depreciation that could aggravate the problems for the economy as a whole, and for the public finances in particular. In such a scenario the negative impact on the Irish economy of the two related shocks would be cumulative, with the direct impact of the decline in the US economy dominating the

secondary effects of the decline in sterling. A combination of Scenario 1 (the worst case sterling scenario) and the US equity price shock would see the deterioration in exchequer savings peaking at around 2.5 percentage points of GNP and the debt/GNP ratio rising by a maximum of around 6.5 percentage points of GNP.

What this highlights is that, compared to the 1970s, Ireland is now probably much more vulnerable to shocks to the US economy than to shocks that merely affect the UK. It is only in so far as movements in sterling are likely to be correlated with movements in the dollar that the Irish economy is likely to suffer serious adverse consequences from a fall in the value of sterling. Even then, the bulk of the damage is likely to be done by the economic shock that might cause the exchange rate change, not by the change in parity itself. These results suggest a greater need to hedge against shocks to the US economy than against sudden changes in sterling's external value.

## 1. Introduction

Prior to 1979 the Irish pound was formally linked to sterling on a one-to-one basis. The decision of the Irish authorities to enter the Exchange Rate Mechanism (ERM), while the UK remained outside, broke that link. Since 1979 the Irish pound has fluctuated in value between sterling £0.74 to sterling £1.10. Between 1987 and 1992 a higher degree of exchange rate stability was achieved. However, the currency crisis (1992-93) dispelled the notion that this stability was permanent. The Irish pound ceased to exist in January 1999 with entry to EMU and a fixing of the exchange rate against other participating currencies<sup>2</sup>. The decision of the UK to opt out of EMU means that the Irish economy is still exposed to an asymmetric shock from changes in the valuation of the UK currency<sup>3</sup>.

By its very nature a shock is unanticipated. However, despite virtually constant references to being overvalued, sterling has remained strong on international foreign exchanges. The performance of sterling is of particular importance to the Irish economy from a competitiveness viewpoint. The sterling exchange rate is also important in determining Irish inflation (Fitz Gerald and Shortall, 1998). The study carried out by the ESRI in 1996 on the economic implications of Ireland's membership of EMU examined the impact of sterling shocks on the Irish economy, considering both the case of a sterling depreciation and the case of a sterling appreciation.

The Irish economy has experienced rapid growth since 1996/97 and the structure of the economy has changed. As a result, it is timely to consider how these changes affect Ireland's vulnerability to sterling shocks today. This paper examines what would be the impact of a sudden large depreciation of sterling on the Irish economy in the immediate future, using the ESRI macro-model and the National Institute for Economic and Social Research (NIESR) world model NiGEM.

As in the case of the original 1996 study, because of the openness of the UK economy, it is essential to consider the impact of sudden changes in sterling on the UK as well as on the Irish economy. The UK economy would not stand still in the face of such a shock and the

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<sup>2</sup> A more detailed examination of the experience of the Irish pound between 1979 and 1999 is given in Power (1999).

<sup>3</sup> An asymmetric shock is one that affects one country disproportionately compared to other countries.



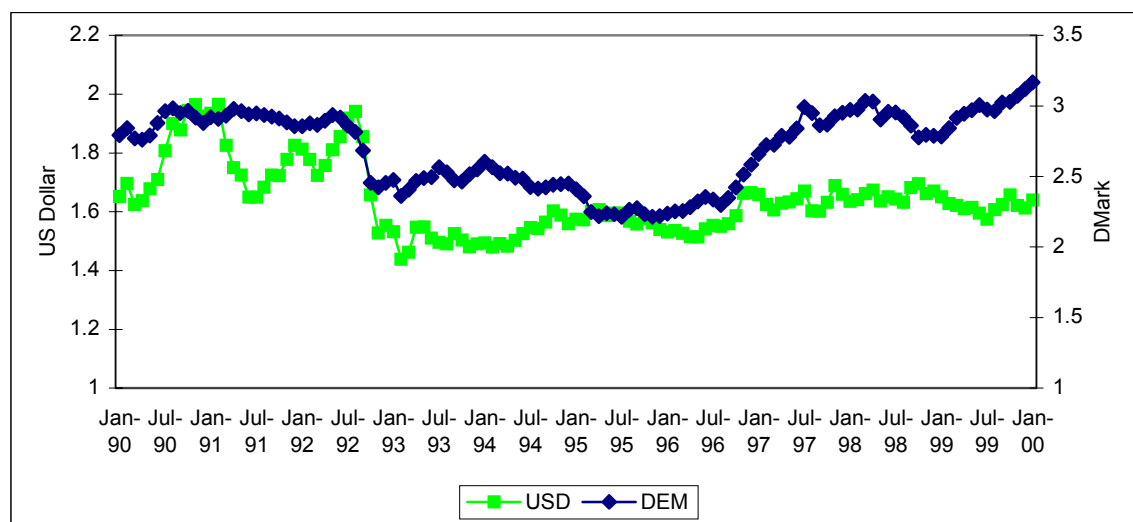
impact on Ireland will depend on how prices and wages in the two economies change as a result of such a shock relative to one another and also relative to third countries.

Section two of this paper examines the performance of sterling on international currency exchanges and the implications for the UK economy. Section three summaries the results from the EMU study published in 1996. Section four outlines the implications for Ireland of sterling's strength and considers the impact of a sudden 25 per cent depreciation in sterling on both the Irish and the UK economies. Section five presents our conclusions.

## 2. Sterling and the UK economy

A sharp appreciation of sterling occurred in 1997 and the currency has remained strong on the financial markets ever since (Figure 1). This appreciation has been primarily against the Dmark, (subsequently the euro) as sterling has remained broadly stable against the US dollar. The causes of the appreciation of sterling include monetary and fiscal policy, changes in financial portfolio allocation in the lead up to EMU, a rise in oil prices, a shift in demand for UK tradable goods and services and higher productivity in the production of tradable goods and services (Bank of England, 1997, NIESR, 1997).

*Figure 1: Sterling Exchange Rate, Jan. 1990-Jan. 2000, monthly averages*

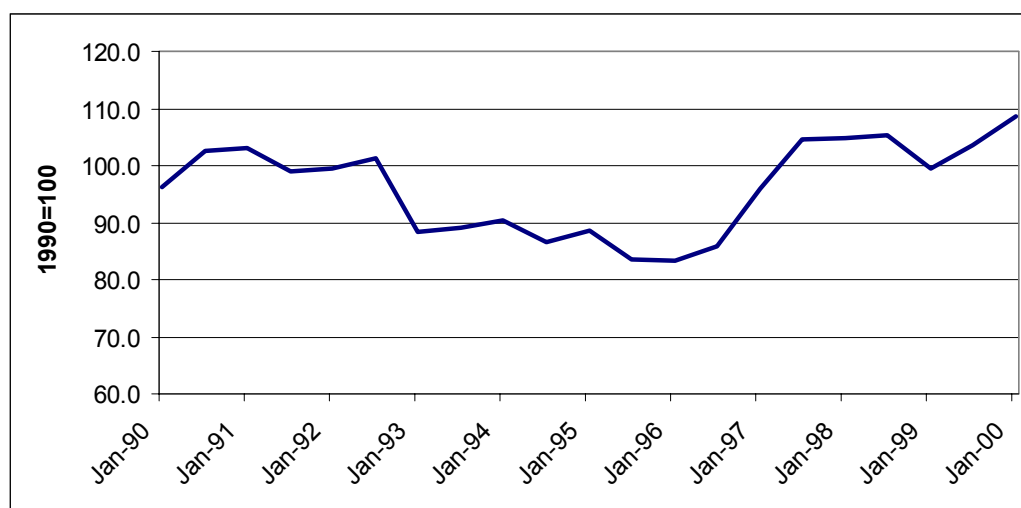


Source: Bank of England

The sterling effective exchange rate between 1990 and January 2000 is shown in Figure 2. Between July 1996 and January 2000 the effective exchange rate has risen by 26.7 per cent. The strength of sterling has not reduced inflation by as much as might have been expected, reflecting the traditional slow adjustment of domestic prices to exchange rate changes and (Greenslade, Henry and Jackman, 1998) also reflecting the strength of domestic demand.

Conventionally a high exchange rate should serve to lower inflation. However, despite the strength of sterling, underlying inflation, excluding mortgage interest payments, has remained close to the official target of 2.5 per cent.

*Figure 2: Sterling Effective Exchange Rate*



Source: Bank of England

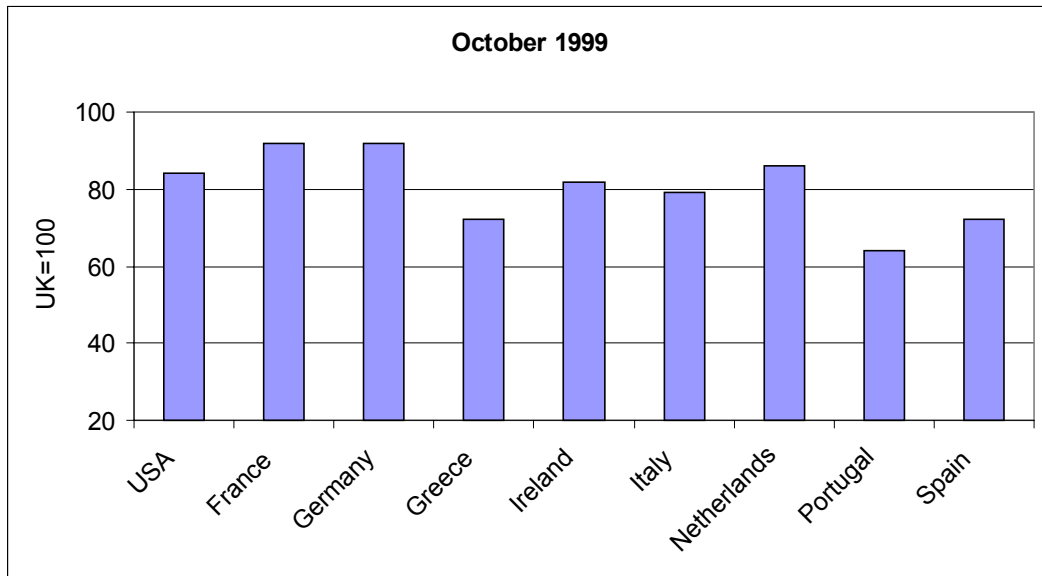
With competitive markets and free movement of goods one might anticipate that prices in different markets, converted into a common currency, would eventually be identical. This theoretical long-run equality is referred to as Purchasing Power Parity (PPP). Exchange rate literature shows that while PPP does not hold in the short run, real exchange rates (nominal exchange rates adjusted for differences in price levels) tend towards relative PPP in the very long run.<sup>4</sup> Figure 3 shows the most recent comparative price levels compiled by the OECD for a number of countries relative to the UK based on the same representative basket of goods and services. Until the appreciation of sterling began in 1997 the absolute price level in the UK had been below that in Ireland over the previous decade. The price level in both Ireland and the UK were, in turn, both substantially below that in Germany and France. However, OECD data indicates that the rise in sterling has resulted in the UK price level moving way out of line with that in Ireland. It is also significantly above the level in Germany and France for the first time in the last 30 years. While significant long-term differences between EU

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<sup>4</sup> Absolute PPP implies that price levels are identical across countries whereas relative PPP implies that the rates of inflation in a common currency will be similar across countries, resulting in unchanged relative prices. The assumption of absolute PPP is a very strong one and it does not hold good for the members of the EU: absolute price differences between countries (or even regions) may remain indefinitely due to transportation costs, cultural differences etc.

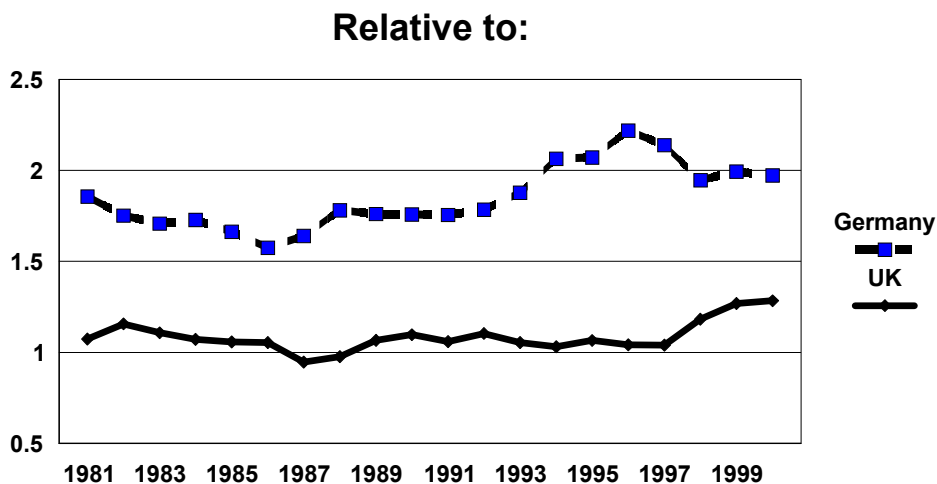
members in the price of services is possible over a prolonged period, such a major long-run reversal in the overall relative price position is unlikely to be sustainable. With the single market, competition will eventually erode differences in goods prices or, more likely, the value of sterling will eventually change to restore the normal relationship between price levels within the EU.

**Figure 3: Comparative Price Levels relative to the UK**



Source: OECD *Main Economic Indicators*, January 2000

**Figure 4: Manufacturing Labour Costs Relative to Ireland, 1980-1999**



Source: Eurostat Labour Cost Survey, 1996, 1995 & wage rates

Figure 4 compares manufacturing labour costs over time in a common currency and shows that a sharp rise in UK labour costs relative to Ireland has occurred since the appreciation of

sterling in 1997. Even taking account of differences in social insurance payments, manufacturing labour costs in the UK are now over 25 per cent higher than in Ireland. This contrasts with the situation over the last 20 years when UK costs have generally been 5 to 10 per cent higher than Ireland. The rise in sterling has also seen a major narrowing in the gap between labour costs in Germany and the UK, with the gap being at its lowest level for over 30 years. Unless massive changes have taken place in the UK economy in recent years, this loss of competitiveness is unlikely to be sustained indefinitely.

### **Is sterling overvalued?**

The widely held view is that the appreciation of sterling has led to the currency being overvalued, a point made by NIESR in successive *Economic Reviews* since 1997. The UK economy has already had experience of the repercussions from an overvalued currency. Sterling entered the Exchange Rate Mechanism in October 1990, two days after German Unification Day, at a rate of DM2.95, criticised at the time for leaving the currency overvalued. Following massive foreign exchange speculation, the currency dropped out of the mechanism on 16 September 1992, and subsequently fell to a low point of DM 2.35<sup>5</sup>. Between 1992 and 1996 the currency remained weak.

Estimates of the extent of the current overvaluation of sterling vary. Analysis calculating an equilibrium real exchange rate for the UK using fundamental equilibrium exchange rate analysis shows that the sterling effective exchange rate was 18 per cent overvalued in the middle of 1997, implying an exchange rate of DM2.30 (Church, 1999). Allowing for movements in prices and exchange rates since then, Church estimates “that the gap between actual and equilibrium in the second quarter of 1999 is probably nearer 23 per cent, even allowing for the slight upward trend in the equilibrium rate.” In a speech looking at alternative exchange rate models, Wadhvani (1999) presents some purchasing power parity estimates for the sterling/DM bilateral rate using different price and cost indices, ranging from DM2.37 to DM2.60. Based on these estimates, sterling was between 14 and 25 per cent overvalued in the middle of 1999. Econometric analysis in an IMF working paper (Alberola et al. 1999) finds that sterling was 15.5 per cent overvalued against the euro at the end of 1998. This article also suggests that an appropriate value for sterling to join EMU of around 0.8 euros per pound, implying roughly parity between the Irish pound and sterling. These articles

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<sup>5</sup> See also Temperton, Paul, ed. (1993) *The European Currency Crisis*, Probus Publishing Company, Cambridge

indicate that the extent of sterling's overvaluation in recent years is estimated to have ranged from 14 to 25 per cent.

Despite the strength of sterling there does not appear to date to have been a significant impact on the UK economy as a whole. The UK economy grew by 2.6 per cent in 1996, 3.5 per cent in 1997 and 2.2 per cent in 1998. It was feared that the economy would enter a recession in 1999 but this was avoided and the economy, in fact, grew by 1.9 per cent. NIESR (January 2000) forecast that the UK economy is set to grow at an annual average of 2.6 per cent between 2000 and 2006.

It is worth noting that in recent times some commentators have put forward the view that sterling is in fact not as overvalued as has been thought. Wadhvani, 1999, presents an estimate of the intermediate term equilibrium exchange rate that was only marginally below the actual exchange rate at the time (around DM3 as against market levels of around DM3.04).

NIESR, 2000, makes the point that the UK economy does appear to have made some adjustment to the high exchange rate. While maintaining that sterling is overvalued, NIESR in preparing their forecasts, have derived an estimate of the rate at which sterling would join EMU using the information available in the yield curve.<sup>6</sup> Based on the most recent NIESR forecast (January 2000), it is assumed "that the euro recovers to a rate of £1= €1.51 by early 2003, and that the rate against sterling is stable thereafter". If this were the entry rate it would represent a much stronger value of sterling than that suggested by the calculations of "equilibrium exchange rates". However, even this high valuation would require sterling to depreciate from current levels over the course of the next few years.

As discussed above, the price level has not reacted to the strength of sterling. This is not out of character with past behaviour when sterling was overvalued. Firms tend to hold their prices on the UK market with the expectation that sterling will eventually adjust to restore the "equilibrium" value of the currency. As discussed later, on foreign markets, especially the Irish market, there is evidence that UK exporters are not raising their Irish pound prices by anything like the amount that the strength of sterling would imply. Instead they are taking a major cut in profit margin to maintain market share. This behaviour by UK firms is an implicit statement that they do not see the current exchange rate as being sustainable.

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<sup>6</sup> This is a simplistic exercise as medium-term interest rates (and the shape of the yield curve) represent a weighted average of the market's forecasts of future interest rates and exchange rates on two assumptions: that the UK does join and the UK does not. The weights are, necessarily, unknown.

The fact that sterling is significantly overvalued at current rates means that the implications of a major depreciation of sterling from the current level is likely to be very different from what it would have been if it had occurred in 1996. Such a fall today would just restore UK competitiveness to its expected long-run level whereas a fall in sterling in 1996 would have conferred a major improvement in UK competitive position compared to that experienced over the previous 20 years.

### 3. Previous Analysis of Sterling Shocks

As part of an assessment of the economic implications for Ireland of EMU, Baker *et al.* (1996) considered the impact of a sterling shock on the Irish economy under a number of different EMU membership scenarios. Of relevance to this study is the scenario where Ireland was assumed to be a member of EMU but the UK was assumed to remain out. One of the possible shocks examined was that of a sudden large depreciation in the value of sterling of the order of 20 per cent. This would have brought sterling from an exchange rate of just over parity to something over GBP£ 1.20 per Irish pound.

In 1996, when the study was undertaken, sterling was probably not far from its long-run "equilibrium" value so that any permanent change in value could have been expected to be reflected in prices and wages in both the UK and Ireland. The evidence discussed in the study suggested that there would have been a slow adjustment in UK wages and prices. In the first year wages and prices would have risen by under 2 per cent. The second year would have seen a much bigger increase to a level of 4 to 5 per cent above the benchmark and by year 4 prices and wages in the UK would have been generally 10 per cent above the benchmark. Initially Irish prices would have fallen slowly so that during year one Irish consumer prices would have been on average over 14 percentage points higher than in the UK. By year four the gap would have been largely eliminated. For wage rates the gap would have remained significant for the first four years indicating that the competitiveness effects of the shock could have been quite persistent.

**Table 1: EMU Study: Gap between UK and Irish Prices and Wages in £IR, %**

Year	Prices		Wage Rates
	Consumer	Producer	
1	14.1	12.4	15.0
2	8.4	6.5	10.1
3	4.4	3.1	6.1
4	2.1	1.7	3.5
5	1.2	1.6	2.5

Source: Economic Implications of EMU, ESRI, 1996

To estimate the likely competitiveness effects of the sterling shock the adjustment path for prices and wages, shown above, was imposed on the *HERMES* Medium Term Model. The resulting simulations provided an estimate of the potential effects of such a shock on Irish output and employment.

The EMU study found that the effects of a sterling shock were greater if Ireland was a member of EMU compared to when Ireland was outside EMU. This was because the appreciation of the Irish pound against sterling was greater than if Ireland was outside EMU. Furthermore, because there was no change vis-à-vis the euro, firms' output prices fell, putting an additional squeeze on their profit margins. This squeeze persisted in the simulations for four years until wage rates in Ireland and the UK fully adjusted.

The result of this simulation was a fall in the level of GNP of 1.4 percentage points in year one, increasing to 1.6 percentage points in year two. The model also pointed to a substantial loss of employment in both years. However, after the second year the disruption from the shock was found to reduce as wages and prices in both the UK and Ireland would by then have begun to adjust. If firms survived the initial shock, after four years all the adverse effects would have been eliminated and employment would be back to where it would have been without the shock. This assumed that firms could ride out the severe effects of the temporary loss of competitiveness. If many firms failed to survive the shock then in the medium-term a significant part of the initial loss of employment, amounting to 5,000 to 10,000 jobs, could have turned out to be fairly permanent.

**Table 2: EMU Study (1996): Macro-economic Effects of Sterling Depreciation of 20%,  
(Ireland in EMU, UK out)**

Year	1	2
GNP, %	-1.4	-1.6
Employment, Industry, (000)	-17.5	-24.8
Employment, Total, (000)	-19.5	-27.9
Industrial Exports, (%)	-0.9	-2.4

Source: Economic Implications of EMU, ESRI, 1996

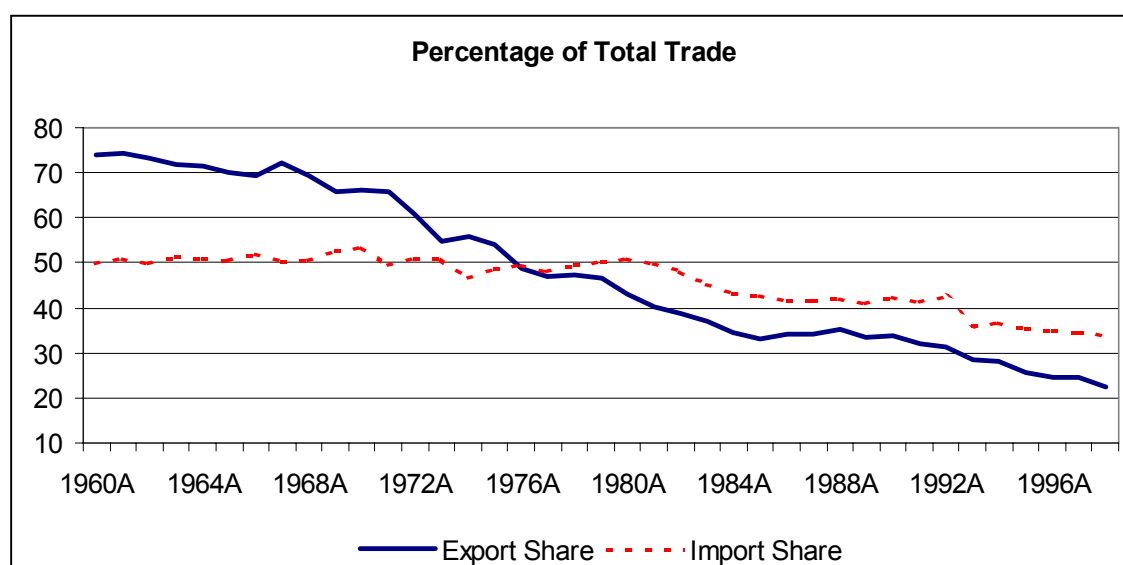
Generally, these results suggested that while the adjustment of prices and wages in Ireland **and** in the UK would moderate the impact of the competitiveness loss, the traditional

manufacturing sector, in particular, would have been hit by such a sudden sterling depreciation. However, the situation today is rather different as there has been extremely rapid change in the structure of the economy and sterling is very overvalued at present. In the next section we consider how these changes may have affected the Irish economy's exposure to a sterling shock of this type.

#### 4. Implication Today for Ireland of a Sterling Depreciation

We first consider a range of indicators of how the structure of the Irish economy has changed in recent years. The general import of these indicators is that the economy has become steadily less dependent on the UK, with the pace of change, if anything, increasing in recent years. We then discuss the current context – whether sterling is overvalued and what the implications of the current rate of exchange is for future exchange rate shocks. Finally, we examine a range of different scenarios on sterling weakness to establish the likely implications for the Irish economy generally and, more specifically, for the public finances. These results are set within a broader context.

*Figure 5: Share of Irish Trade with the UK, 1960-1998*



##### **Ireland's changing economic structure**

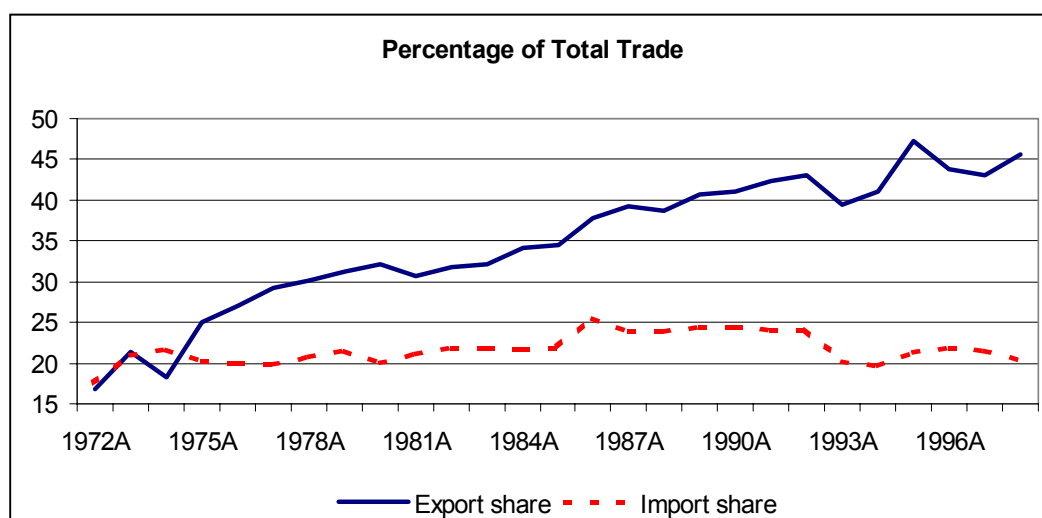
Exposure to a sterling shock depends on the structure of the Irish economy and the behaviour of the economic agents that operate within the economy. Historically the UK has been a very important economic neighbour in terms of trade and, indeed, in terms of the labour market. Figure 5 shows the UK's share of Irish imports and exports since 1960. As is evident from the Figure, there has been a steady decline in dependence. Having averaged 71 per cent between



1960 and 1969, export dependency had fallen to 22.6 per cent by 1998. The decline in import dependency is less dramatic. From an annual average of 51 per cent during the 1960s, import dependency has fallen to 34 per cent in 1998.

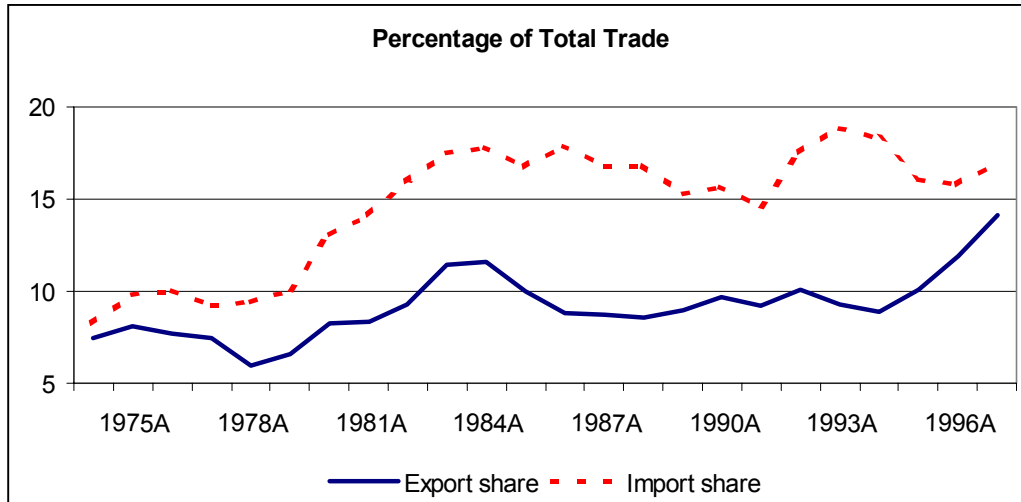
Declining dependency on the UK means increasing dependency on other economies as a market for exports and a source of imports. Figures 6 and 7 show the share of Irish trade with the EU (excluding the UK) and the share with the US and Canada. For the EU (excluding the UK) there has been a marked difference in the performance of exports and imports. The EU market has become increasingly important as a destination for Irish exports. Having accounted for 21.3 per cent of exports in 1973, the EU, excluding the UK, accounted for 45.7 per cent of Irish exports in 1998. In contrast, continental Europe has remained broadly static as a source of Irish imports. In 1973, continental Europe accounted for 21 per cent of imports. The import share coming from Europe peaked at 25.6 per cent in 1985 and remained at around 24 per cent until 1992. In 1998 the figure was 20.4 per cent, broadly unchanged from the 1973 figure.

**Figure 6: Share of Irish Trade with the EU excluding the UK, 1972-1998**

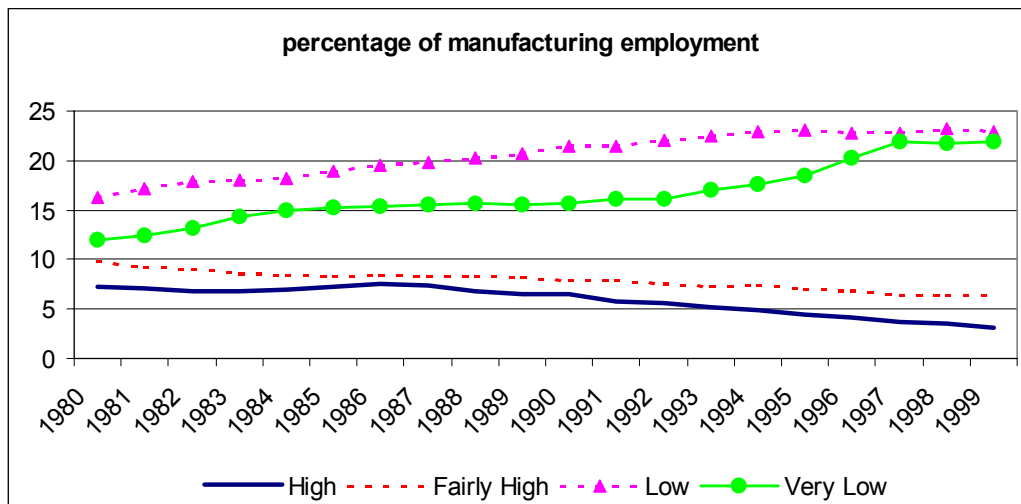


Analysis of the share of Irish trade with the US and Canada since 1975 (Figure 7) points to an increasing export and import dependence. Exports and imports with this region were low in 1975 at 7.4 per cent and 8.2 per cent respectively. In both cases the increase in share has been substantial. In the case of export dependency this increased to 14.1 per cent by 1998, while import dependency increased to 17 per cent over the same time period.

*Figure 7: Share of Irish Trade with US and Canada, 1975-1998*



*Figure 8: Currency exposure*



The report on the *Economic Implications for Ireland of EMU* (Baker *et al.*, 1996) examined the exposure of manufacturing to a sterling shock. The study considered both the currency exposure of individual sectors and their sensitivity to sudden interest rate changes. Based on data to 1993, this analysis found that the sectors which were most exposed to a potential currency risk were those with a considerable proportion of their output sold in the UK market and with a domestic market which was open to UK competition. The fast-growing export-oriented sectors appeared to be relatively insensitive to the level of Irish interest rates and little concerned by sterling exposure. Of the 40 industrial sectors considered, one sector, clothing, was highly exposed to variations in the sterling exchange rate and another three (two processed food sectors and textiles, other than knitted garments) were fairly highly exposed. A further 11 industrial sectors were assessed as moderately exposed to sterling fluctuations. The remaining 25 sectors appear to have had a sterling exposure ranging from fairly low to

low, because they either served mainly non-UK export markets, or had a large and reasonably protected domestic market. Details are given in Appendix Table A.3.

As part of this study, employment figures for the different sectors identified in the EMU study have been calculated for the period 1980 to 1999 to determine if the exposure of the manufacturing sector has changed.<sup>7</sup> In terms of currency exposure there has been a decline in employment in sectors that were assessed as having a high or fairly high currency risk. In 1992 these sectors, clothing, meats, sugar and cocoa confectionery and other textiles, accounted for around 25,500 jobs, or 13.3 per cent of total manufacturing employment. By 1999 this had declined to just over 22,000, or 9.5 per cent of employment in manufacturing. This suggests that, while overall employment levels within these sectors have not declined markedly, growth in manufacturing employment has reduced the importance of these sectors, as shown in Figure 8. It is also worth noting that the sectors that had a low or very low currency exposure have increased in importance based on employment levels. Full details of the sectors by currency exposure are given in Appendix A.1. Employment in low or fairly low currency exposure increased from 73,450 in 1992, 38.2 per cent of manufacturing employment, to 105,050 in 1999, 45.1 per cent of those employed in manufacturing.

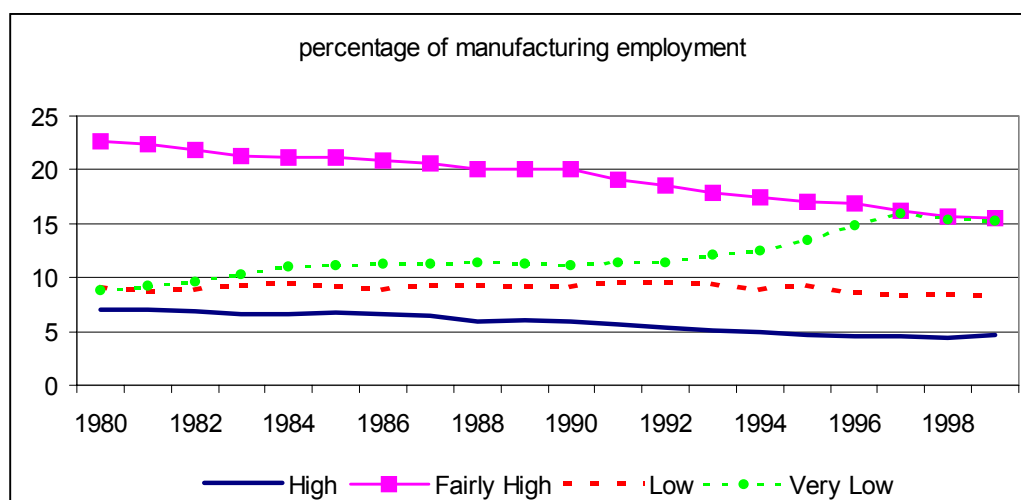
Similar analysis in the EMU report of the sensitivity to changes in Irish interest rates suggested that 8 industry sectors had high or fairly high sensitivity to interest rates changes. These sectors included clothing and various other industries dependent on the domestic market. A large group of 16 industrial sectors were assessed as moderately sensitive to interest rates. The remaining sectors appear to have had relatively low interest rate sensitivity. Details are given in Appendix Table A.3. This analysis is updated using the sectors identified in the EMU study. As is shown in Figure 9 there has been a marginal decline in the sectors having high interest rate sensitivity, namely minerals, and building materials. In 1992 these sectors accounted for 5.4 per cent of manufacturing employment, or 10,650 persons. By 1999 employment in the sector had risen to 11,250. However, growth in total employment resulted in the sector now accounting for 4.7 per cent of manufacturing employment. For the sectors considered with a “fairly high” interest rate exposure, employment in absolute levels increased slightly from 36,725 in 1992 to 37,200 in 1999. However, the proportion of total employment in these sectors also fell from 18.6 per cent to 15.5 per cent (Appendix A2). As is evident from the figure there has been a sharp increase in the proportion of employment with a “very low” interest rate exposure since 1992. These sectors are for the most part the

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<sup>7</sup> To ensure that the data are as up to date as possible we have used the Quarterly Industrial Inquiry rather than the *Census of Industrial Production*, which provides greater detail.

high-technology firms and include recorded media, high-margin chemical, office machinery and computers, and high-margin food. Employment in these sectors increased from 22,425 in 1992, or 11.4 per cent, to 36,650 or 15.2 per cent of employment in 1999.

*Figure 9: Interest Rate Sensitivity*



This analysis of employment trends since the 1996 report was published suggests that the proportion of manufacturing employment in sectors particularly exposed to sterling fluctuations (or relatively sensitive to Irish interest rate movements) has declined quite rapidly.

Over the last ten years the HERMES model of the Irish economy has been used extensively for policy simulation and forecasting. Since it was first estimated, with data for the period 1974 to 1987, it has been re-estimated every two or three years including later data. Each time more recent data have been included, the sensitivity of the manufacturing sector to changes in labour cost competitiveness is seen to have fallen. On the other hand, the sensitivity to interest rates has risen over time. Given the decline in the proportion of employment in manufacturing in sectors particularly exposed to interest rate fluctuations, this change in the model implies some more generalised increased interest rate sensitivity, both in manufacturing sectors not previously considered very exposed, and also elsewhere in the economy. With the big increase in the share of resources now devoted to investment, especially in housing, this change in exposure demonstrated in the model is not very surprising.

This change in model behaviour reflects the changing structure of the economy as many firms in the tradable sector that were vulnerable to competition from low cost countries have gone under, and been replaced by new high technology firms. As identified above, this is reflected

in the decline in the number of manufacturing firms vulnerable on labour cost grounds to a sterling shock. It also underlies the changing structure of Irish trade.

### **Impact of a sterling shock in the current environment**

The potential impact of a major change in the bilateral sterling-euro (Irish pound) rate depends to a major extent on where the two economies are beginning from - is sterling overvalued or undervalued. It also depends on whether the change in the exchange rate is perceived to be permanent or temporary.

For example, if sterling and the Irish pound were initially at levels that were consistent with the underlying economic structures of the two economies, and if, as a result, prices and wages had also fully adjusted to that rate, then any new change in the rate that was perceived to be permanent would have an economic effect. It would result in a change in prices and wages in the two economies and it would also affect the long-term relative competitiveness of the two economies. In turn, the perceived change in profitability could affect investment flows.

However, if sterling was beginning from a position where it was considered very “overvalued” in terms of the euro, and if everyone had assumed that this overvaluation was temporary, then prices and wages might not have adjusted to this “temporary” overvalued exchange rate. Firms would continue to supply each other’s markets anticipating that future exchange rate changes would restore the profitability of such sales to a “normal ” level. In this latter case, a reversion of sterling towards what might be considered its “equilibrium” rate might have little effect. Prices, not having changed in response to the overvaluation, would not change in the face of a depreciation. Firms would also not change their output and sales as there was no change in their expected long-term profitability.

The evidence, discussed in Section 2, suggests that today sterling is grossly overvalued from the point of view of economic fundamentals. Prices within the UK, expressed in a common currency, are out of line with those in Ireland or elsewhere in the euro zone. Instead of the UK price level falling to bring UK prices (and wages) back into line with their normal relationship *vis a vis* competitor countries, firms are waiting for the exchange rate itself to undertake the adjustment. However, in their trade with the outside world there are signs that UK manufacturers are behaving differently from the past.

If prices were determined in the UK in sterling and adjustment in Irish prices happened instantaneously in the face of exchange rate changes, then the big change in the bilateral exchange rate in 1997-98 would have caused a major rise in Irish inflation in 1998. However, the actual inflation rate for 1998 was only 2.4 per cent, indicating a much more complex

relationship between Irish inflation and the Irish pound value of sterling. Research published in 1998 (Fitz Gerald and Shortall, 1998) helped explain this relatively low rate of inflation. It indicated that if the change in sterling's value moves the UK away from its long run equilibrium exchange rate, the impact on Irish inflation would be small. It also suggested that there was a change in the behaviour of UK firms in the face of the start of EMU:

*“When sterling is out of line with their expectations the danger of losing market share on the European market constrains them from passing through the effects of changes in exchange rates.”*

What appears to have happened is that UK firms, fearing increased competition on the broader euro-zone market, including Ireland, moved to setting prices on the Irish market in euros. As a result, they tended to hold their prices relatively unchanged in Irish pound terms, fearing a loss of market share if they did not. Effectively the UK suppliers on the Irish market are behaving as price takers. The UK manufacturer or supplier, therefore, largely carries the cost of this failure to adjust prices in the form of reduced profit margins. Hall, Walsh and Yates, 1997, using data from a Bank of England survey carried out in 1995, found that market price levels are of primary importance in price determination for UK companies. Furthermore, the survey found that companies typically reviewed prices at regular time intervals, rather than responding to particular events.

The inflation outturn in Ireland in 1998 and 1999 was different from what would have been suggested by models of inflation based on past behaviour. Under the previous model of inflation, while the pass through of an appreciation of sterling would have been slow, some of the appreciation would eventually have shown through in Irish prices. This certainly had not happened up to mid-1999. The evidence from the last two years would, thus, suggest a change in behaviour by UK firms moving them, if not the UK economy as a whole, into the euro-zone.

An example, of this strategic behaviour by firms in the face of exchange rate uncertainty was the response by an Irish firm, the Irish Distillers Group in 1987, faced with rapidly changing exchange rates. They responded to a query from the Restrictive Practices Commission explaining differences in the net of tax prices for their product North and South of the border:

“The company’s N.I. price list was fixed in 1986 on a projected value of the Irish pound to sterling of 85p and this value should be used to give a true indication of the difference.”<sup>8</sup>

The fact that their expectations about the exchange rate were not realised immediately did not cause them to change their prices. Their forecast for the exchange rate, while wrong for the period in question, proved reasonably accurate for 1988 and 1989. What this shows is that exchange rate expectations are at least as important in determining economic behaviour as is the actual current exchange rate.

For Irish exporters on the UK market there is some evidence that they have seen an improvement in profit margin as they failed to fully cut the sterling price of their goods as sterling strengthened. However, the evidence from the wholesale price index and the deflator for exports in 1998 and 1999 suggests that the extent of profit-taking has been relatively low.<sup>9</sup> The latest data for end 1999 does suggest a pick up in such prices, but much of this may be accounted for by other factors, such as the rise in oil prices.

The effect of the high valuation of sterling over the last two years has been to squeeze profitability of UK firms and, to some extent, to enhance the profitability of Irish firms exporting to the UK over the period. What is difficult to assess is the extent to which this change in profitability, that firms themselves may regard as temporary, has affected investment. If the high valuation of sterling had been regarded as permanent then one would have expected to see a shift in investment, with firms closing in the UK and firms opening in Ireland just because of the exchange rate change. However, while the economy in Ireland has been very successful over the period, it seems unlikely that much of the investment in the business sector has been driven by the current sterling value. The cost of making an investment and the time-lags inherent in any major investment decision means that it must be a “forward looking” choice by firms. It is their expectations about future profitability a number of years ahead that determines the choices made by firms. It is only where firms have spare capacity North and South of the border, as in the case of some food processing plants, that output can rapidly be shifted to take advantage of temporary changes in exchange rates. However, this must be seen as the exception rather than the rule.

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<sup>8</sup> Restrictive Practices Commission, 1987

<sup>9</sup> In addition, for some of the high-tech. manufacturing firms both their inputs and their outputs are effectively priced in dollars. In this case it is the strength of the dollar rather than the strength of sterling that is important.

## **Sterling Depreciation Scenarios**

As discussed in Section 2, early in 2000 we begin from a position where sterling is clearly overvalued, where UK prices are out of line with the prices of competitor countries and where either sterling will have to fall or there will have to be deflation in the UK. In trade with Ireland, many UK firms have not raised their prices in line with the sterling appreciation. Under these circumstances how will UK firms react to a return of sterling towards its long-run equilibrium value?

First, there is unlikely to be much of a rise in inflation in wages or prices within the UK after such an exchange rate change. It would, instead, serve to return the UK price level to its normal relationship with the price level in its trading partners.

Secondly, because prices of UK goods sold in Ireland were generally not raised to take full account of the rise in sterling's value, they will not fall when sterling falls. Instead, UK exporters are likely to take the opportunity to restore the normal margins on their sales.

Thirdly, the extent of the likely impact on Irish firms will depend on the extent to which they have changed their behaviour in the face of the sterling strength. If firms have expanded or set up in Ireland specifically because of the favourable exchange rate then they could be expected to react unfavourably to a reversal of the situation. However, it would appear that the expectations of most firms, as evidenced in their pricing policy, has been that this is a temporary situation and it would appear unlikely that any major investment decisions have been made on the assumption that the current situation will persist.

Finally, there may be some firms that were already facing difficulty competing with UK firms. Their situation has been temporarily improved by the high value of sterling. Some of these firms might close in the face of a major fall in the value of sterling.

If the first three of these suppositions were correct and the final one proved insignificant then there would be no direct impact on the Irish economy from a major fall in sterling's value. However, the reality is that these three points are likely to be only partly true so we have examined a range of possible scenarios. We consider the most adverse combination of circumstances to set an upper limit to Ireland's likely exposure to a sterling shock and compare it to the situation if the first three propositions were true. In each case we consider a depreciation of sterling against the euro from the beginning of 2001 of 25 per cent so as to take the value of sterling in Irish pound terms approximately to parity.



On the basis of the above analysis, the effects of a sudden large depreciation in sterling can be expected to lie between two polar cases. In the first case it is assumed that firms have not adjusted their prices to sterling's high value so that an unwinding of the current position would have no direct effects of the rate of inflation in Ireland or the UK. We then consider how the loss of competitiveness faced by Irish firms impacts on the economy. Because there is no chance under this scenario of Irish firms' costs adjusting downwards or of UK firms' costs adjusting upwards this produces the most adverse long-term impact on competitiveness. The second scenario we consider is where UK and Irish prices are assumed to have adjusted to the high value of sterling. In this case, because prices and wages can adjust, the long-term loss of competitiveness is small, though the short-term loss is similar to that in the first scenario. The final "extreme" assumption is that firms in the UK and Ireland have continued to make key decisions based on their expectations concerning the long-term bilateral exchange rate, which is very different from the current rate. As a result, under this scenario, a movement of sterling that validates these expectations could be expected to have little or no economic effect.

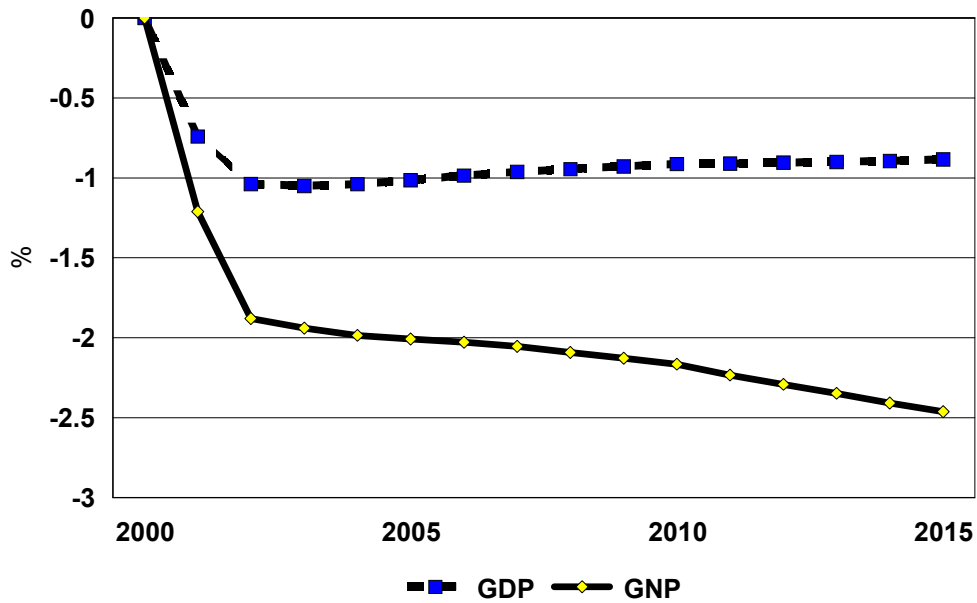
#### **Scenario 1, Sterling falls 25 per cent – no change in either UK or Irish prices or wages**

Central to this scenario is the assumption that firms in both the UK and Ireland see the current exchange rate as abnormal and they are holding their prices in foreign markets unchanged. However, in their home markets it is assumed that the misalignment has not affected the rate of inflation so, when sterling falls, there is no pick-up in inflation in the UK and there is no moderation of inflationary pressures in Ireland. The main economic impact of this change is that after a fall in sterling Irish goods become considerably less competitive on the UK market and Irish output and exports contract.

This is clearly an extreme case because it assumes that the Irish production structure has fully adjusted to sterling's strength and that it needs this level of competitiveness to survive but that prices have not adjusted. In this simulation it is assumed that this "loss of competitiveness" when sterling falls is fully passed through into job losses.

Figure 10 shows the impact of the assumed loss of competitiveness on GNP. By the end of the second year of the shock GNP could be expected to be down around a cumulative 2 per cent compared to the base line. Because the extreme assumption is made that there is no adjustment in prices or wages, there is no mechanism to return GNP to its original baseline level. The sector particularly vulnerable to the shock, traditional manufacturing, would see output fall by a cumulative 5 percentage points over the first three years. Thereafter it would tend to stabilise at the new lower level of output.

*Figure 10: Effect on GNP, Sterling falls 25%, No change in prices in UK and Ireland*



*Figure 11: Change in Employment, Sterling falls 25%, No change in prices in UK and Ireland*

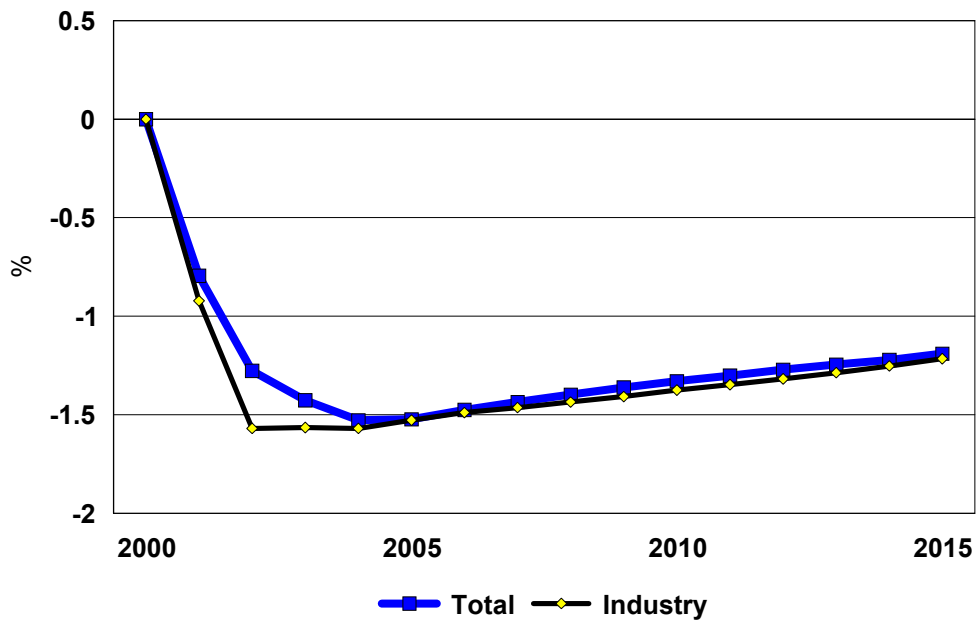
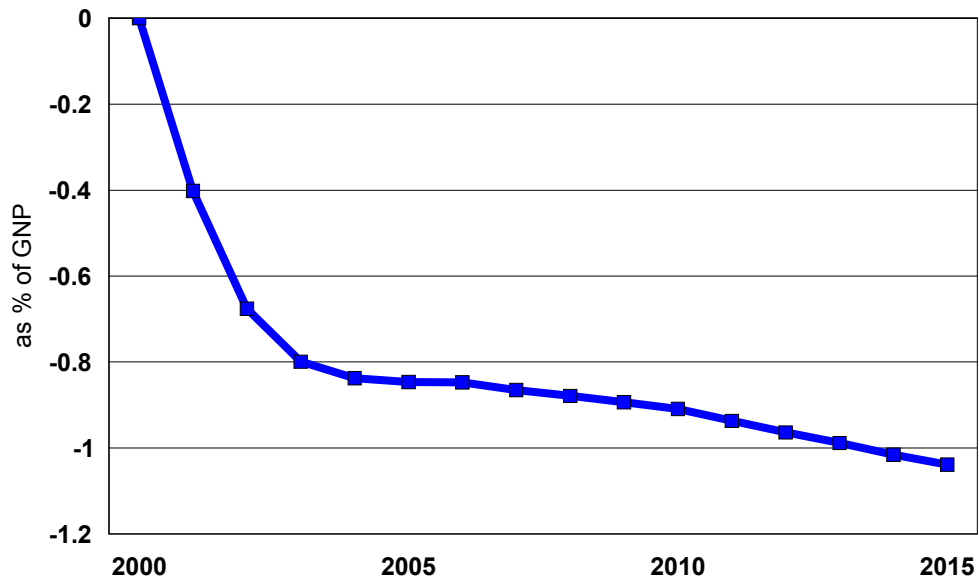
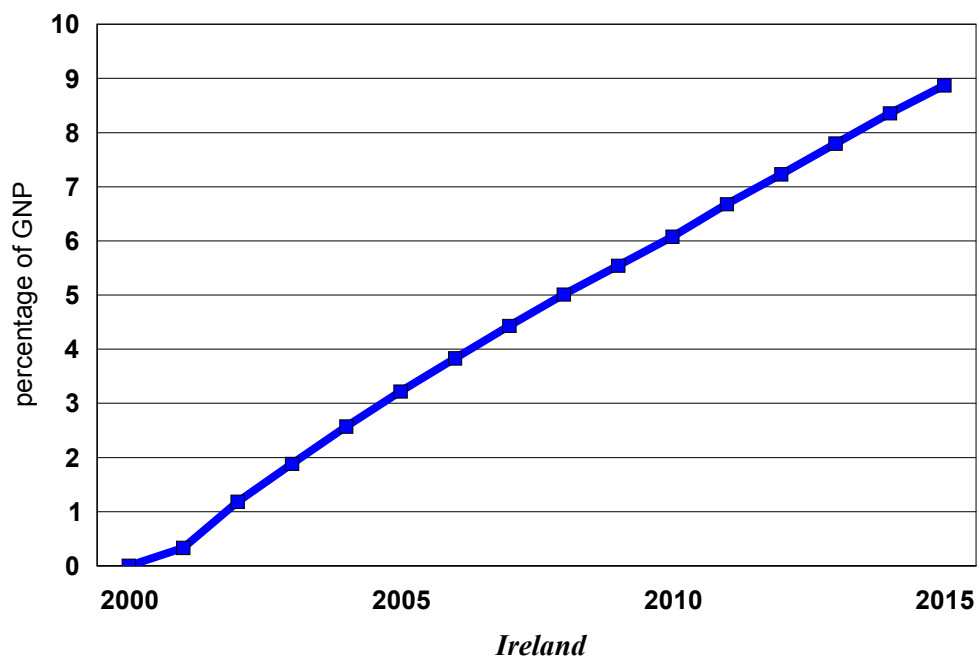


Figure 11 shows the impact on employment. In industry and services the initial decline in the two years after the shock would be around 1.5 per cent. The unemployment rate would be raised by a cumulative 1.2 percentage points over the first few years. Thereafter, as emigration picked up (immigration fell), the labour force would begin to fall, reducing the unemployment rate.

*Figure 12: Change in Government Saving, Sterling falls 25%, No change in prices in UK and Ireland*



*Figure 13: Change in Debt/GNP Ratio, Sterling falls 25%, No change in prices in UK and Ireland*



Government saving would fall (borrowing rise) initially by about 0.8 per cent of GNP (Figure 12). After the first few years it would continue a slow deterioration because we have assumed

that the government does not respond by raising taxes or cutting expenditure. The result would be that the debt/GNP ratio would show a steady deterioration over the course of the decade (Figure 13). This illustrates the cumulative impact on the public finances of the shock. The main costs to the exchequer in year one (2001) would be a fall in tax revenue of over 1 per cent, rising to 3 per cent by year 3. With rising unemployment, increased social welfare payments would raise current government expenditure. The increased burden on the exchequer would be greater but for the assumption that a significant number of those losing their jobs would emigrate (or not immigrate) so that they would not receive welfare payments.

**Scenario 2, UK prices fully adjust – Irish prices and wages also fall**

The major difference between this Scenario and Scenario 1 is that UK and Irish prices are here assumed to be in equilibrium before the shock takes place. The result is that, when faced with a shock that is assumed to be permanent, prices and wages adjust upwards in the UK. In the case of Ireland, prices and wages adjust downwards as the value of sterling falls. While the sterling shock initially results in a serious loss of competitiveness, this loss is eroded in subsequent years by differential inflation in the UK.

*Figure 14: Change in GNP, Sterling falls 25%, Prices in UK and Ireland adjust*

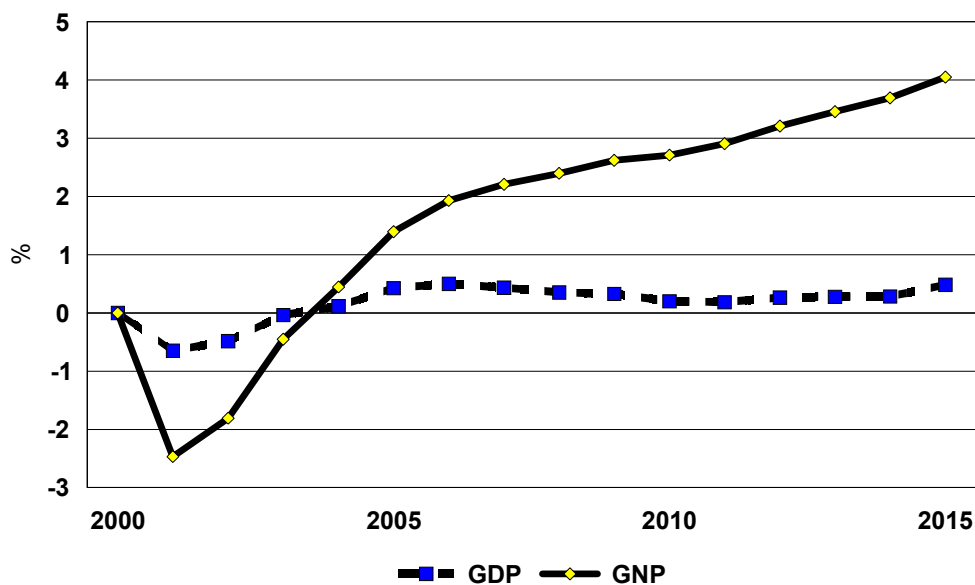
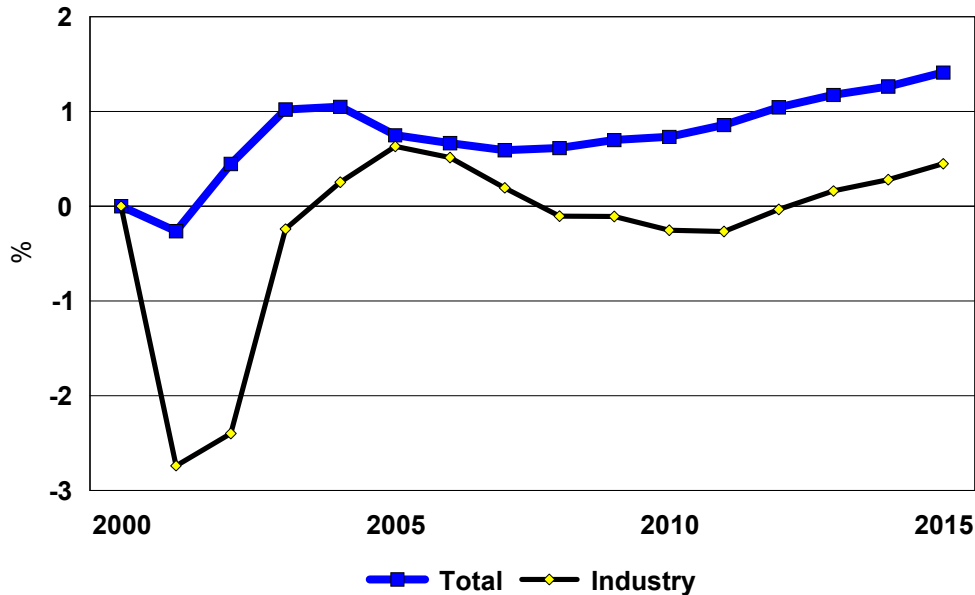


Figure 14 shows the impact on GNP of the depreciation of sterling, where the results are shown as a percentage change compared to the baseline. Initially the fall in GNP would be around 2 per cent, similar to that in scenario 1. However, as prices and wages adjust in the

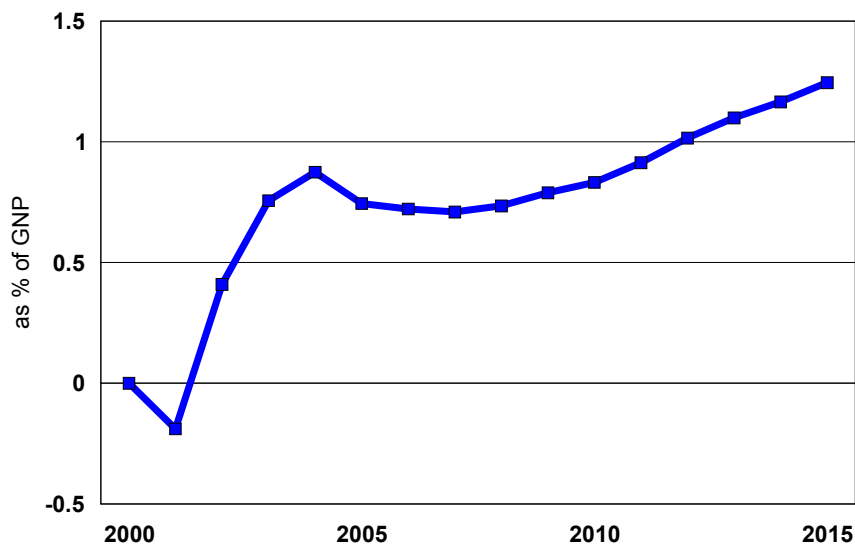
UK and in Ireland, after 4 years output in Ireland would be back to where it would have been without such a competitiveness shock.

**Figure 15: Change in Employment, Sterling falls 25%, Prices in UK and Ireland adjust**



The change in employment is shown in Figure 15. While there is a substantial fall in employment in the industrial sector in the first two years, by year 4 the effects have effectively disappeared. In addition, the economy wide effects on employment are small. These results are rather different from those in scenario 1 where there is assumed to be a permanent loss of competitiveness.

**Figure 16: Change in Govt. Savings, Sterling falls 25%, Prices in UK and Ireland adjust**



This scenario is very similar to the simulation undertaken in the EMU report (Baker *et al.*, 1996) except that the sterling devaluation is 25 per cent here, not 20 per cent. While the effects on GNP of the two simulations are similar (when allowance is made for the different size of the shock), the impact on employment in scenario 2 is significantly lower. In Baker *et al.*, 1996, a 20 per cent depreciation of sterling was estimated to produce a decline in industrial employment of 25,000, or around 6 per cent, whereas here a 25 per cent depreciation produces a decline of just under 3 per cent (13,000). This reflects the changing structure of the economy discussed earlier and, as a result, the changing exposure to sterling shocks.

Figure 16 shows the impact on government savings under this scenario. Even initially there is very little adverse impact on the public finances. This is because inflation in prices and wage rates is much higher under this option and inflation tends to be good for the exchequer in the short run. This is illustrated by a comparison with the results in scenario 1 where prices and wages do not adjust and there is no inflation “bonus” for the exchequer (with rapid inflation tax revenue tends to rise due to bias towards under indexation).

**Figure 17: Change in Debt/GNP ratio, Sterling falls 25%, Prices in UK and Ireland adjust**

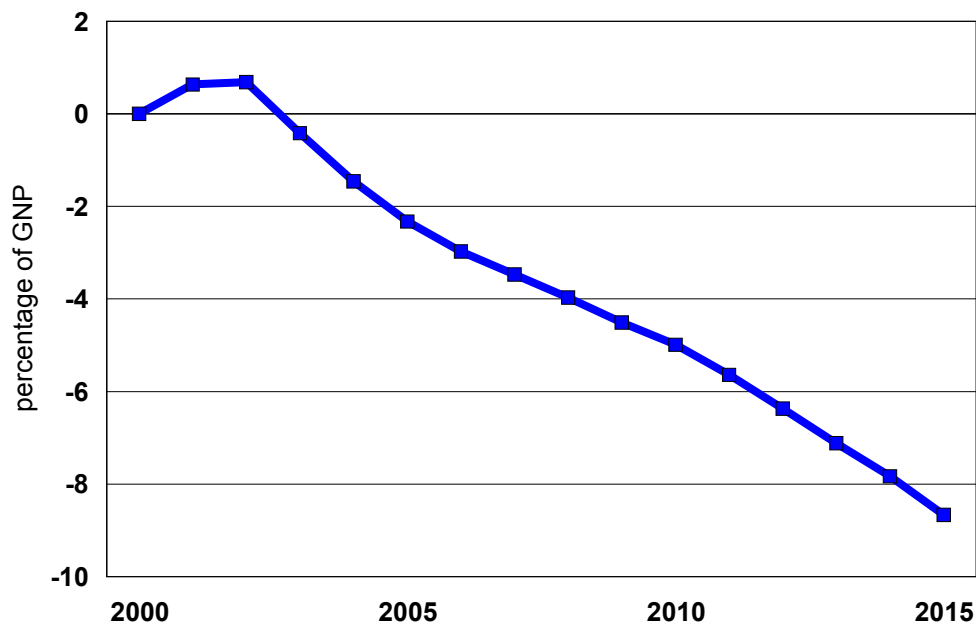


Figure 17 shows the cumulative impact of the shock on the public finances, as reflected in the debt/GNP ratio. In this scenario, because of the higher inflation and the resulting “inflation tax”<sup>10</sup>, the debt/GNP ratio actually falls. Outside of a monetary union such a rise in inflation would have a wider impact on expectations in the economy. However, inside EMU such regional inflationary shocks would not impact significantly on the financial markets.

**Scenario 3, No change in prices, wages in Ireland or the UK and no change in competitiveness.**

A third possibility is that, not only have firms held their prices unchanged in the UK and in Ireland in the face of the appreciation of sterling, but they have may also have ignored the competitiveness effects of this change in their decisions on future output and employment. This would be the case if firms had fully discounted the current strength of sterling and a substantial fall to be expected at some date in the short to medium term. Under these circumstances firms in Ireland would view their current enhanced profitability as a windfall gain and firms in the UK would view their losses in a similar light.

As with scenario one, considered above, this would be an extreme case. However, the evidence from the UK would suggest that firms have not been closing down and relocating elsewhere in large numbers because of the strength of sterling. Its strength may have postponed some investment decisions. It is only in particularly vulnerable sectors, such as clothing, that vulnerable firms may have closed prematurely.

The mirror image to this picture of the UK is that firms in Ireland have probably not made major investment decisions conditional on the current strong value of sterling. It is only firms that are particularly vulnerable to the UK market that may have had a stay of execution as a result of sterling’s strength. It is these latter firms that would be likely to close in the face of a major depreciation of sterling in the next few years.

To the extent that this scenario has validity, the impact of a sterling depreciation of 25 per cent would be very small. There would be little impact on output and employment, though the rate of profit, which is currently very high, would be squeezed in firms that have particularly benefited from sterling’s strength. In the case of the public finances there would be some reduction in revenue from corporation tax consequent on lower profitability, but this would be small in the context of the public finances as a whole.

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<sup>10</sup> The real value of debt is reduced by inflation

## Most Likely Outcome

The research evidence discussed above is not sufficiently conclusive to allow us to say exactly where the Irish and UK economies lie within the boundaries delineated by these three Scenarios. What does seem clear is that sterling is overvalued (or the euro undervalued). Price and wage levels in Ireland and the UK have not fully adjusted to the current situation. However, firms, while generally discounting the current strength of sterling, have probably built its strength into some decisions on output (e.g. vulnerable firms staying in business) or investment. Scenario 2, where prices and wages are assumed to have fully adjusted in both Ireland and the UK to the current exchange rate, is not consistent with the evidence on price levels. As a result, the most probable outcome lies somewhere between scenarios 1 and 3.

*Table 3: Effects of Different Shocks on the Exchequer*

	Exchequer Savings as percentage of GNP				Debt/GNP Ratio as percentage of GNP			
	Scenario 1	Scenario 2	Scenario 3	US Equity Shock	Scenario 1	Scenario 2	Scenario 3	US Equity Shock
Year 1	-0.4	-0.2	0	-1.2	0.3	0.6	0	3.4
Year 2	-0.7	0.4	0	-1.7	1.2	0.7	0	5.3
Year 5	-0.8	0.7	0	-0.1	3.2	-2.3	0	3.8

Table 3 shows the cumulative impact of a series of shocks on exchequer savings and on the debt/GNP ratio after one, two and five years respectively. For comparative purposes we have also included the possible impact of a US equity price shock, a scenario that is described in detail in the *Medium-Term Review: 1999-2005*. The shock involving US equity prices falling by 25 per cent was assumed to have a serious impact on foreign direct investment into Ireland, triggering a collapse in Irish house prices. Such a shock would have a much greater impact on the Irish economy, and on the government sector, than would any of the sterling shock scenarios considered here.

In the event of a 25 per cent depreciation in sterling, from the point of view of the public finances the worst case scenario is scenario 1. However, even with such a shock the likely maximum impact on exchequer savings would be under one percentage point of GNP and the cumulative increase in the debt GNP ratio after five years would be 3.2 percentage points. As discussed above, because the most probable outcome from a sudden sterling depreciation



would lie between Scenarios 1 and 3, this would suggest that the public finances are not very exposed to sterling shocks. However, if the shock were sufficiently great to trigger a collapse in Irish house prices then these results would be significantly magnified.

When the results of a sterling shock under different scenarios is compared with the results from a shock to the US economy the latter would appear to be much more serious from the point of view of the economy as a whole, and the exchequer in particular. This suggests that the Irish economy, and the Irish exchequer, is now more exposed to the US economy than to shocks to sterling.

Movements in sterling have been correlated with movements in the dollar in recent years. A particularly adverse set of circumstances would arise if there were a serious shock to the US economy that also triggered a fall in sterling's value, along with that of the dollar. Under these circumstances, the likely impact on the Irish economy would be greater than that shown for a US equity price shock on its own. However, the additional adverse effects coming through a weakening of sterling would be significantly smaller than those generated directly by the shock to the US economy. This highlights the growth in Ireland's exposure to shocks to the US economy affecting the Irish economy both directly and indirectly.

This analysis would suggest that when the likely realignment of sterling occurs, if it is not accompanied by any other shocks, the effects on the Irish economy will be unfavourable, but the magnitude of any adverse effects will be small. Thus the public finances seem likely to be reasonably robust in the face of a sterling shock taking place on its own.

## **Conclusions**

The analysis presented above indicates that, on the basis of economic fundamentals, sterling is significantly overvalued. The UK's robust performance in the face of this difficult trading environment suggests that the "equilibrium exchange rate" for sterling relative to the euro may not be as low as was previously thought. However, it is clearly well below the current rate. While economic "fundamentals" rarely play a role in determining the path of exchange rates in the short term, they do have an impact in a longer time horizon. In this light, we would expect a substantial change in the bilateral sterling - Irish pound (euro) rate in the medium term.

We have examined the implications of a sudden large change in the sterling - euro rate (25 per cent depreciation) to obtain a feeling for the vulnerability of the economy as a whole, and for the public sector in particular. What our analysis suggests is that the economy and the public sector have limited vulnerability to a sterling shock taking place on its own. The vulnerability

has fallen significantly over the 1990s and is likely to fall further in the immediate future. The sectors that are particularly exposed remain some parts of traditional manufacturing, where employment is not particularly skills intensive, and where output is vulnerable to international competition.

For the public sector, the scenarios examined suggested a likely initial impact on exchequer savings of under one percentage point of GNP. The maximum cumulative impact on the debt/GNP ratio after 5 years would be around 3.2 percentage points. However, these are the most extreme results, with the likely outturn being almost certainly substantially lower than this.

Depending on the causes of any major change in exchange rates, the Irish economy's vulnerability could be rather different. In particular, the behaviour of sterling and the dollar has been correlated in recent times. As discussed in the *Medium-Term Review*, a major shock to the US economy could have a much bigger impact on the Irish economy. In one scenario examined in the *Review* exchequer savings were reduced by something under a half a percentage point of GNP for every one percentage point reduction in growth consequent on a disruption of the US economy.

If such a shock to the US caused a sterling depreciation, along the lines discussed in Section 4, then that could aggravate the problems for the economy as a whole, and for the public finances in particular. In such a scenario the negative impact on the Irish economy of the two related shocks would be cumulative, with the direct impact of the decline in the US economy dominating the secondary effects of the decline in sterling. A combination of Scenario 1 (the worst case sterling scenario) and the US equity price shock would see the deterioration in exchequer savings peaking at around 2.5 percentage points of GNP and the debt/GNP ratio rising by a maximum of around 6.5 percentage points of GNP.

What this highlights is that compared to the 1970s, Ireland is now probably much more vulnerable to shocks to the US economy than to shocks that merely affect the UK. It is only in so far as movements in sterling are likely to be correlated with movements in the dollar that the Irish economy is likely to suffer serious adverse consequences from a fall in the value of sterling. Even then, the bulk of the damage is likely to be done by the economic shock that might cause the exchange rate change, not by the change in parity itself. These results suggest a greater need to hedge against shocks to the US economy than against sudden changes in sterling's external value.

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Appendix A1: CURRENCY EXPOSURE, PERCENTAGE OF TOTAL EMPLOYMENT

Sectors	Exposure	1975	1980	1985	1990	1995	1999
Clothing	High	9.90	7.24	7.27	6.52	4.45	3.09
Meats, Sugar & Cocoa Confect, Other Textiles	Fairly High	4.09	9.69	8.34	7.81	7.01	6.35
Meat production, Dairying, Domestic Processed Food, Other Transport, Other Chem,  Paper and Print, Metal Prod, Export Metal Articles, Domestic Appliances	Moderate	34.58	28.96	26.86	24.95	24.17	23.99
Domestic Metal Articles, Knitted, Wood prod, Other Non-Metal Min, Prod Mach, Grain, Printing, Motor Manuf, Other Manuf	Fairly Low	27.92	25.85	23.34	23.57	22.69	21.82
Mineral Building Materials, Fish Prod, Rubber & Plastics, Elec Mach, Motor Bodies & Parts, Misc Manuf,  Communic Equip, Drinks, Tobacco	Low	15.67	16.34	18.95	21.50	23.15	22.90
Jewellery, Medical Precision and Optical Instrum, High-margin Food, Office Mach & Computers, Chemicals, Recorded Media	Very Low	7.83	11.92	15.24	15.66	18.53	21.86
Total		<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Appendix A2: INTEREST RATE SENSITIVITY, PERCENTAGE OF TOTAL EMPLOYMENT

Sectors	Exposure	1975	1980	1985	1990	1995	1999
Mineral Building Materials	High	7.44	6.95	6.74	5.91	4.69	4.68
Clothing, Furniture, Wood prod, Knitting, Other Non-Metal minerals, Motor Manuf, Domestic Metal Articles	Fairly High	27.08	22.70	21.13	20.04	17.02	15.47
Other Textiles, Other Chem, Paper and Paper Products, Leather & Footwear, Other Transport, Metal Prod, Export Metal Art, Prod. Mach, Drink & Tobacco, Processed Food, Fish, Rubber & Plastics, Printing, Other Manuf	Moderate	30.74	35.24	32.94	33.38	32.93	31.69
Process Meat, Sugar & Cocoa, Domestic Appliances, Elec Mach & Equip, Medic Precision & Optical Instrum, Jewellery, Motor Bodies & Parts, Misc Manuf, Grain Products	Fairly Low	17.07	17.16	18.78	20.30	22.50	24.47
Meat Prod, Dairy Prod, Communications Equip	Low	11.65	9.17	9.22	9.18	9.39	8.44
High-Margin Food, Recorded Media, High-Margin Chem, Office Mach and Computers	Very Low	6.02	8.77	11.19	11.19	13.47	15.24
<b>Total</b>		<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

## Appendix A3: Currency and Interest Rate Exposure – EMU Study 1996

*Export Dominated, High Margin Group*

*Criteria: Total Exports > 80% Gross Output, Remainder Net Output > 70% Net Output*

<i>Nace Code</i>	<i>Industry Sector</i>	<i>Total</i>	<i>Employment 1993</i>				<i>Domestic Market</i>	<i>Assessment</i>		
			<i>Market Share</i>					<i>Sterling Exposure</i>	<i>Interest Sensitivity</i>	<i>Transactions Savings</i>
			<i>Dom.</i>	<i>UK</i>	<i>Rest EU</i>	<i>Rest World</i>				
			<i>No.</i>	<i>%</i>	<i>%</i>	<i>%</i>				
1588, 1589	High-Margin Food	1,864	6.5	23.9	32.8	36.8	Not Significant	V. Low	V. Low	V. Low
223	Recorded Media	2,625	7.4	19.2	62.4	11.1	Not Significant	V. Low	V. Low	Low
2414,2441,2442, 2452,246	High-Margin Chemicals	11,755	12.2	10.8	49.0	28.0	Largely Intra-Industry	V. Low	V. Low	Low
30	Office Machines and Computers	8,880	14.1	21.9	39.4	24.6	Largely Intra-Industry	V. Low	V. Low	Low
33	Medical, Precision and Optical Instruments	10,185	7.5	16.2	44.7	31.6	Not Significant	V. Low	V. Low	V. Low
3622, 3661	Jewellery, etc.	1,993	26.1	3.7	3.6	64.7	Local Non-Trading Units	V. Low	Low	V. Low
<b>Total Group</b>		<b>37,302</b>	<b>11.5</b>	<b>15.8</b>	<b>43.3</b>	<b>29.4</b>	<b>Not Significant</b>	<b>V. Low</b>	<b>V. Low</b>	<b>V. Low</b>
<b>Absolute Employment</b>		<b>37,302</b>	<b>4,290</b>	<b>5,894</b>	<b>16,151</b>	<b>10,967</b>				

*High Export, U.K Minor Group*

*Criteria: Total Exports > 60% Gross Output, UK < 25% Gross Output*

<i>Nace Code</i>	<i>Industry Sector</i>	<i>Total</i>	<i>Employment 1993</i>				<i>Domestic Market</i>	<i>Assessment</i>		
			<i>Market Share</i>					<i>Sterling Exposure</i>	<i>Interest Sensitivity</i>	<i>Transactions Savings</i>
			<i>Dom.</i>	<i>UK</i>	<i>Rest EU</i>	<i>Rest World</i>				
		<i>No.</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>				
1520	Fish Products	2,065	37.8	7.2	41.1	14.0	Product Based, Fairly Protected	V. Low	Moderate	Moderate
25	Rubber and Plastics	8,460	42.20	17.40	36.60	3.8	Fairly Open	Fairly Low	Moderate	Low
291, 292, 293, 294, 295	Production Machinery	8,840	39.3	14.6	26.5	19.5	Fairly Open	Fairly Low	Moderate	Low
31	Electrical Machinery and Equipment	10,222	21.6	25.8	33.8	18.8	Open	Low	Fairly Low	Low
32	Communication Equipment	6,097	12.5	17.5	45.8	24.3	Open	Low	Low	Low
3420, 3430	Motor Bodies and Parts	2,439	30.40	6.50	56.20	6.9	Fairly Open	Low	Fairly Low	Low
363, 364, 365, 3662, 367	Miscellaneous Manufactures	2,321	13.2	17.7	47.6	21.5	Fairly Open	Low	Low	Low
Total Group		40,444	29.30	17.80	37.10	15.80	Fairly Open	Low	Low	Low
Absolute Emp.		40,444	11,850	7,199	15,005	6,390				

*Domestic Dominated Group*

*Criterion: Total Exports < 20% Gross Output*

<i>Nace Code</i>	<i>Industry Sector</i>	<i>Total</i>	<i>Employment 1993</i>				<i>Domestic Market</i>	<i>Assessment</i>		
			<i>Market Share</i>					<i>Sterling Exposure</i>	<i>Interest Sensitivity</i>	<i>Transactions Savings</i>
			<i>Dom.</i>	<i>UK</i>	<i>Rest EU</i>	<i>Rest World</i>				
		<i>No.</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>				
156, 1571, 1581, 1582	Grain Products	7,530	92.5	6.2	1.0	0.4	Fairly Protected	Fairly Low	Moderate	V. Low
153, 154, 1552, 1585, 1586, 1587	Domestic Processed Foods	2,928	88.8	9.0	1.4	0.7	Fairly Open	Moderate	Moderate	V. Low
1592, 1594, 1596, 1597, 1598	Non-Spirit Drink	4,020	82.8	10.6	1.7	4.9	Fairly Protected	Low	Moderate	V. Low
221, 222	Printing	11,290	86.1	7.1	4.5	2.3	Fairly Protected	Low	Moderate	V. Low
264, 265, 266, 267	Mineral Building Materials	4,568	92.4	5.9	1.5	0.3	Mostly Protected	Low	High	V. Low
3,410	Motor Manufacture	828	95.2	2.6	0.8	1.3	Fairly Protected	Low	Moderate	V. Low
3663 (incl 23)	Other Manufactures	1,097	54.3	12.2	22.6	10.90	Mixed Sector	Low	Moderate	Low
Total Group		32,261	87.5	7.4	3.1	2.0	Fairly Protected	Low	Moderate	V. Low
Absolute Employment		32,261	28,228	2,388	1,000	645				



High Export, UK Major Group

Criteria: Total Exports > 60% Gross Output, UK > 25% Gross Output

Nace Code	Industry Sector	Total	Employment 1993				Domestic Market	Assessment		
			Market Share					Sterling Exposure	Interest Sensitivity	Transactions Savings
			Dom.	UK	Rest EU	Rest World				
		No.	%	%	%	%				
1551	Dairying*	6,991	(20)	(37)	(28)	(15)	Fairly Protected	Moderate	Low	Fairly Low
17 excluding 1772	Other Textiles	6,921	22.8	38.4	30.9	7.9	Mostly Open	Fairly High	Fairly Low	Fairly Low
27	Metal Production	2,278	20.20	24.50	27.40	27.90	Mostly Open	Moderate	Moderate	Fairly Low
2822,2830,2861, 2862,2863,2871 2872,2873,2874	Export Metal Articles	3,985	32.6	26.2		17.8	Mostly Open	Moderate	Moderate	Fairly Low
297	Domestic Appliances	3,324			23.4		Minor	Moderate	Low	Moderate
			10.60	33.70	45.90	9.8				
Total Group		23,499	21.60	33.90	30.50	14.0	Mostly Open	Moderate	Fairly Low	Fairly Low
Absolute Employment		23,499	5,079	7,969		3,278				
					7,173					

\* Market Share Estimates provided by Department of Agriculture.

Moderate Exports, UK Minor Group

Criteria: Total Exports 20%-60% Gross Output, UK < 20% Gross Output

Nace Code	Industry Sector	Total	Employment 1993				Domestic Market	Assessment		
			Market Share					Sterling Exposure	Interest Sensitivity	Transactions Savings
			Dom.	UK	Rest EU	Rest World				
		No.	%	%	%	%				
1511, 1512	Meat Production*	9,011	(36)	(17)	(23)	(24)		Moderate	Fairly Low	Fairly Low
1,591	Spirits	1,051	78.10	5.50	9.10	7.3	Fairly Protected	Low	Moderate	Low
16	Tobacco	1,178	78.40	1.10	14.70	5.9	Fairly Protected	Low	Moderate	Low
1,772	Knitted Garments	1,520	59.40	7.60	17.0	16.0	Fairly Protected	Low	Fairly Low	Moderate
19	Leather and Footwear	1,161	49.80	15.60	18.30	16.3	Mixed	Moderate	Fairly Low	Low
20	Wood Products	4,105	80.70	14.80	3.0	1.5	Fairly Protected	Low	Fairly High	V. Low
261, 262, 263, 268	Other Non-Metal Mineral Products	4,476	48.70	13.20	13.20	24.9	Fairly Protected	Low	Moderate	Low
2811, 2812, 2821, 2840, 2851, 2852, 2875	Domestic Metal Articles	5,553	80.2	14.4	2.7	2.7	Mixed	Low	Moderate	V. Low
35	Other Transport	5,467	49.50	9.20	12.50	28.80	Fairly Protected	Moderate	Fairly Low	Low
Total Group		33,522	57.10	13.10	13.0	16.8	Fairly Protected	Fairly Low	Moderate	Low
Absolute Employment		33,522	19,126	4,395	4,360	5,641				

\* Market Share Estimates provided by Department of Agriculture.

Moderate Exports, UK Major Group

Criteria: Total Exports 20%-60% Gross Output, UK > 20% Gross Output

Nace Code	Industry Sector	Total	Employment 1993				Domestic Market	Assessment		
			Market Share					Sterling Exposure	Interest Sensitivity	Transactions Savings
			Dom.	UK	Rest EU	Rest World				
		No.	%	%	%	%				
1583, 1584	Sugar and Cocoa Confectionery	3,511	44.8	42.4	4.10	8.8	Mixed	Fairly High	Moderate	V. Low
1513, 1572	Processed Meat etc. Products	4,189	56.6	36.5	4.70	2.2	Fairly Open	Fairly High	Moderate	V. Low
18	Clothing	11,087	41.6	41.8	11.3	5.2	Open	High	Fairly High	Low
21	Paper and Paper Products	4,137	71.1	21.8	5.60	1.5	Fairly Open	Moderate	Fairly High	Low
2411,2412,2413, 2415,2416,2420, 2430,2451,2470	Other Chemicals	4,351	43.9	26.9	20.0	9.2	Fairly Open	Moderate	Moderate	Fairly Low
361	Furniture	3,749	72.4	24.5	2.60	0.4	Fairly Protected	Moderate	High	V. Low
Total Group		31,024	52.0	34.3	9.0	4.7	Fairly Open	Fairly High	Fairly High	Low
Absolute Employment		31,024	16,115	10,645	2,796	1,468				

*Summary*

<i>Group</i>	<i>Employment 1993</i>					<i>Domestic Market</i>	<i>Assessment</i>		
	<i>Market Share</i>						<i>Sterling Exposure</i>	<i>Interest Sens.</i>	<i>Trans. Savings</i>
	<i>Total</i>	<i>Dom.</i>	<i>UK</i>	<i>Rest EU</i>	<i>Rest World</i>				
<i>No.</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>					
Export Dominated	37302					Not significant	V. Low	V. Low	V. Low
High Export, UK Minor	40444	11.50	15.80	43.30	29.40	Fairly Open	Low	Low	Low
Domestic Dominated	32261	29.30	17.80	37.10	15.80	Fairly Protected	Low	Moderate	V. Low
High export, UK Major	23,499	87.50	7.40	3.10	2.0	Mostly Open	Moderate	Fairly Low	Fairly Low
Moderate Export, UK Minor	33,522	21.60	33.90	30.50	14.0	Fairly Protected	Fairly Low	Moderate	Low
Moderate Export, UK Major	31024	57.10	13.10	13.0	16.80	Fairly Open	Fairly High	Fairly High	Low
Total Manufacturing	198,052	52.0	34.30	9.0	4.70				
		42.80	19.40	23.50	14.30				
Total Absolute Employment	198,052	84,688	38,490	46,485	28,389				