Multinationals and Indigenous Employment: An "Irish Disease"?

FRANK BARRY
AOIFE HANNAN
University College Dublin

Abstract: In trade studies, Ireland emerges as having a revealed comparative *dis*advantage in labour-intensive industries. Can the country's unusual industrial structure contribute to our understanding of its high unemployment? The Dutch-disease models we explore suggest that the inflow of multinationals would have stimulated employment when the exchange rate was linked to sterling, but could have had less benevolent consequences when the exchange rate became more flexible. We also discuss a number of alternative hypotheses on the relationship between multinational and aggregate employment.

I INTRODUCTION

I reland's unusual industrial structure has frequently been remarked upon. A specialisation in relatively labour-intensive exports would seem appropriate for a country that, on the strength of the unemployment statistics at least, seems relatively labour abundant.

As shown in Barry and Hannan (1995) however, exports from Ireland and Spain, the two peripheral EU countries with very high unemployment rates, are concentrated in the most modern manufacturing sectors (Chemicals, and Machinery and Transport Equipment) compared to the low-unemployment

peripheral countries of Greece and Portugal which specialise in the more labour-intensive sectors of Basic and Miscellaneous Manufacturing. Similar findings are reported by Neven (1990).

Our aim in this paper is to explore whether this apparently warped industrial structure has a role to play in explaining Ireland's high unemployment.

The industrial structure of course is a consequence of Ireland's success in capturing a high share of multinational investment. Prima facie evidence that this had led to the crowding-out of indigenous manufacturing employment is presented in Figure 1. Between 1973 and 1994 the numbers employed in the manufacturing sector in Ireland remained roughly constant at around 200,000; in 1973, however, indigenous employment was double that in the multinational sector, whereas today the proportions are closer to half and half.

The main body of the paper explores the processes by which one sector crowds out another in models of the Dutch disease. Indeed in one of the earliest and most widely cited contributions to this literature, Corden and Neary (1982) suggest that their analysis "is equally applicable to cases where the booming sector is not extractive (such as the displacement of older
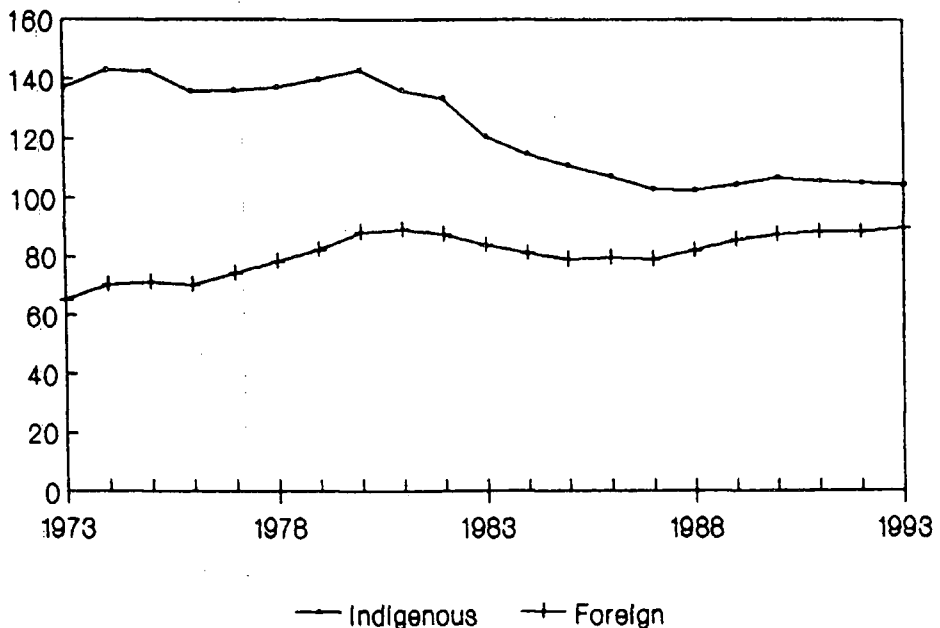
Figure 1: *Manufacturing Employment (000s)*

industry by technologically more advanced activities in Ireland, Japan or Switzerland)."

We also discuss a more radical possibility, however. We analyse whether the Irish strategy of attracting Multi-National Companies (MNCs) could actually have reduced employment, not just in indigenous industry, but also in indigenous and foreign manufacturing combined, and in the aggregate of industry and services.[1]

II THE DUTCH DISEASE AND IRISH CONDITIONS

To set the scene, let us briefly examine the core model of Corden and Neary (1982), which comprises three sectors, a booming sector which we shall call M (for MNC's), a lagging sector which we shall call I (for indigenous tradeables) and a non-tradeable sector N. Let the first two sectors be price takers on world markets. The intersectoral effects of a boom in one of the tradeable sectors is decomposed into (a) the resource movement effect, and (b) the spending effect.

A boom raises the marginal product of labour in M, and induces a movement of labour out of the other two sectors. This resource movement itself has two parts: (i) the direct decline in indigenous manufacturing as labour is drawn from I, and (ii) the indirect decline as the non-tradeables supply curve shifts back, creating, at the initial relative price of non-tradeables (or *real exchange rate*) an excess demand for non-tradeables. This appreciates the real exchange rate and reallocates resources from I to N.

So much for the resource-movement effect. Now consider the spending effect. Some part of the income generated in the booming sector, M, will be spent in the domestic economy, whether by factor owners or indirectly by government (whose tax revenues will be raised). Since the I sector is tradeable, this increased demand has no effect on production or employment there (assuming away Keynesian demand constraints). Its only effect then will be to raise further the price of non-tradeables, and induce a further reallocation from the I to the N sector.

This basic model has of course been much amended and added to, and these extensions are surveyed by Corden (1984) and by Neary (1985).

Let us now modify the model to suit Irish conditions. The most obvious feature of the Irish economy is its extreme openness in both goods and factor markets. Arguably labour should not be treated as a factor in short supply under Irish conditions. With the high levels of unemployment prevailing

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1 Data presented in Barry and Hannan (1995) suggest that on the basis of historical experience Ireland remains under-industrialised, hence the focus on manufacturing as well as on aggregate employment.

throughout most of the period under discussion, and the rapid return of much skilled labour when the Irish labour market boomed briefly relative to the UK in the late 1970s, we may wish to think of labour as being in perfectly elastic supply. This means that the expansion of employment in one sector does not necessarily entail the contraction of other sectors.

The same conclusion appears warranted when the capital market is under discussion. Although multinational companies raise significant amounts of funds for their projects locally, the Irish capital market is extremely open.[2] Furthermore, the authorities have done much to tackle the difficulties faced by small firms in raising capital, which could otherwise be an important barrier to entry.

It seems justifiable, as a first approach at least, then, to assume that there are no factors of production in short supply. The expansion of one sector need not *directly* cause the contraction of others. In terms of the Dutch-disease model this means that the resource-movement effect disappears! The spending effect, of course, remains.

The interaction between the spending effect and the wage rigidities that generate unemployment, then, is the focus of our paper.[3] The model we present below is basically a variant of Neary (1985) with unemployment explicitly taken into account.

III THE MODEL

Assume the M sector is the only one that uses capital, and the shock that sets the booming sector in business is a capital grant, g. This policy sucks capital into the economy, and all eventual returns to capital are assumed to be repatriated. Assuming constant returns to scale the net contribution to the economy is the wage bill (and the taxes) that the sector pays.

With zero foreign inflation tradeable-goods prices are measured by the exchange rate, e, defined as the price of foreign currency.

GNP measured in tradeable-goods prices is therefore

$$Y = (w/e)L_m[(w/e); g] + (p_n/e)Y_n[w/p_n] + Y_i[w/e] \qquad (1)$$

where the terms in square brackets are the arguments of the preceding functions.

3.1. *The Fixed Exchange Rate Case*

In the fixed exchange rate case we will assume real wage rigidity. Nominal wages therefore rise in line with the consumer price index, P,

$$w / P = \text{constant} \qquad (2)$$

where P is the linearly homogenous function:

$$P = \Phi(p_n, e) \qquad (3)$$

As in Neary (1985) we let spending be affected by real balances. The equilibrium condition for the non-tradeable sector is then:

$$Y_n[w / p_n] = D_n[p_n / e; \ Y; \ M / P] \qquad (4)$$

In the absence of the real balance effect, the equilibrium would be unaffected by equiproportionate changes in P_n and e, and would therefore define a 45 degree locus in (p_n, e) space. The real balance effect however makes the slope flatter. This equation is graphed as the NN curve in Figure 2.

Now consider the money-market equilibrium condition

$$M / P = L[Y; \ r]; \quad L_1 > 0, \ L_2 < 0, \qquad (5)$$

where r is the domestic nominal interest rate, which equals the exogenous world interest rate in the fixed exchange rate regime.

From an initial equilibrium where $P_n = e$, homogeneity of degree zero of Y implies

$$dY / dp_n = -dY / de \qquad (6)$$

so the slope of the MM curve is $-\Phi_2 / \Phi_1$. The MM curve therefore slopes downwards in (p_n, e) space.

Finally, we can define an iso-employment locus, LL, as

$$L = L_m[(w / e); g] + L_n[w / p_n] + L_i[w / e] \qquad (7)$$

For a given value of g the real wage rigidity ensures that this is a ray through the origin, i.e., that equiproportionate increases in p_n and e will leave employment levels unchanged. Does employment rise or fall as we move above LL? The condition for employment to rise as we move above LL is well-known. The non-tradeable sector expands, and since nominal wages rise both tradeable sectors contract. The effect on aggregate employment therefore depends on various characteristics of the two sectors. Total employment rises

or falls depending on whether the following condition is met or not:

$$[\in (L_n; p_n / w)/ \in (L_t; e / w)][\in (w; e)/ \in (w; p_n)][L_n / L_t] > 1 \qquad (8)$$

The functions on the left-hand side are the elasticities of sectoral labour demands and of wage demands in non-tradeables and in the average of the two tradeable sectors. Total employment is therefore more likely to rise as we move about LL, the greater is the elasticity of labour demand and the initial level of employment in non-tradeables, and the lower the influence of non-tradeable goods prices on the nominal wage, the latter obviously being related to the share of these goods in private consumption. With a high marginal propensity to import in Ireland, non-tradeable goods prices may be judged to have a relatively small impact on wage demands. Furthermore, since the elasticity of a sector's labour-demand can be written as the elasticity of substitution divided by one minus the cost share for labour, and since the cost share for labour is likely to be highest in non-tradeable services, the labour-demand elasticity in that sector may be judged to be high.[4] This is a standard condition in the literature, and is usually considered to hold.[5,6]

The three curves, NN, MM and LL are depicted in Figure 2, which defines the initial equilibrium as a pair p_{n1} and e_1. Now consider the impact of the capital grant g. The iso-employment locus swings down to the right (assuming the elasticities condition above is met), since an increase in g allows p_n to fall somewhat while maintaining a constant level of employment. The increased level of income at initial prices leads to an excessive demand for non-tradeables, so the NN curve shifts upwards to N'N'. This is the spending effect discussed earlier in the paper.

Now we come to a third effect, denoted in Neary (1985) as the liquidity effect. The rise in GNP raises the demand for money and, for a given money supply, requires a fall in the price level. (We leave discussion of the impact on interest rates until later). This shifts MM back to M'M'.

Under fixed exchange rates, of course, the money supply is endogenous. In the short-run, then, the economy moves onto the new NN curve, N'N', where the balance of payments is in surplus and employment has risen (i.e., we are

4. Thus Bradley, Fitz Gerald and Kearney (1991) find that labour-demand elasticities for services are generally higher than those observed for manufacturing.

5. Much use of it was made in Barry and Devereux (1995) for example.

6. Further evidence that this condition is met in the Irish case may be adduced from the results of Barry and Bradley (1991) and Walsh (1987). Both found that fiscal expansion (*before* taxes were raised to finance it) raised employment, i.e., that the expansion in non-tradeable employment more than dominated the contraction in tradeable sector employment induced by increased wage demands.
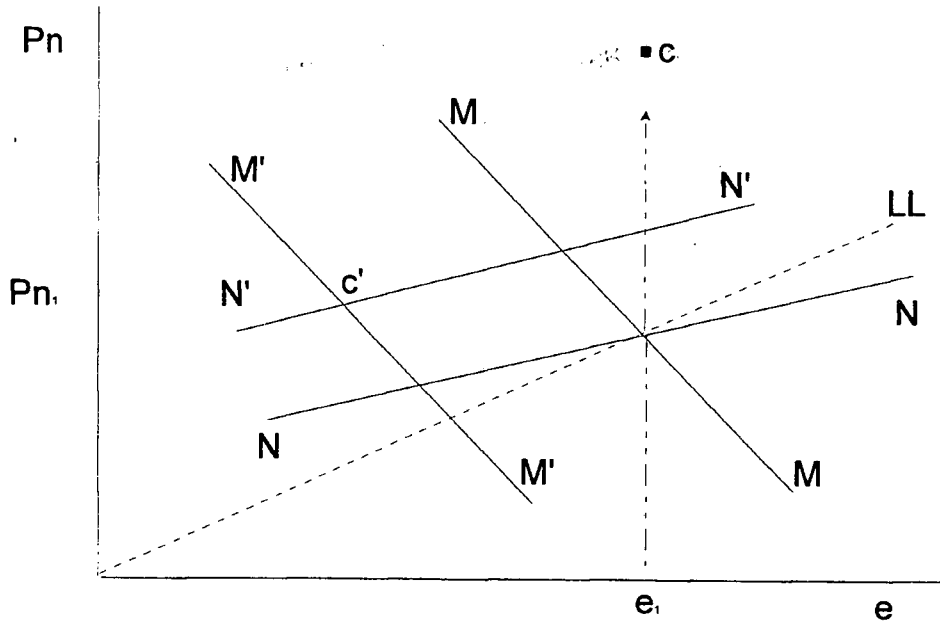
Figure 2: *The Effect of Capital Grants on the Price Non-tradeables and on the Exchange Rate (the Price of Foreign Currency).*

above the new L'L'). As the domestic money stock expands, p_n is driven up further, which, according to our assumptions on the elasticity condition, raises employment still further (though now the non-traded sector is expanding at the expense of both of the tradeable-goods sectors). The continuous increase in the money supply through the balance of payments shifts both the NN curve and the MM curve upwards, until they cross at a point such as C. At this point both the non-traded and the multinational sectors will have expanded at the expense of the indigenous tradeable sector, and employment will be higher. We therefore have a model capable of explaining the apparent crowding-out of indigenous manufacturing by the multinationals, but it suggests that this process has led to net aggregate employment creation rather than destruction.

3.2. *The Flexible Exchange Rate Case*
   Let us now consider how the model operates under a flexible exchange rate. This model is arguably more appropriate for the post-1979 Irish experience since pressures pushing the exchange rate either up or down ultimately contributed to the decision of the authorities on the position to be

taken during the various realignments that characterised the period. [7]

Of course, exchange rate flexibility does not affect the behaviour of the homogenous system we have been working with so far. For the exchange rate regime to make a difference we need a nominal rigidity. We therefore add to the real rigidity of the previous section a requirement that nominal wages cannot fall, i.e. , downward rigidity of nominal wages.

To see what difference this would make we can begin with the assumption of real wage rigidity in the flexible exchange rate case, and see in what direction the nominal wage would have to move to keep the real wage constant. This allows us to continue working with the NN and MM curves derived above, though the LL curve is no longer operative.

The capital-grants shock again then shifts the NN curve up to the left, and the MM curve down to the left. Because with a real wage rigidity the real economy is unaffected by the exchange rate, the long-run *real* exchange rate (i.e., the ratio of the price of non-tradeables to the nominal exchange rate) is the same as in Figure 2 above. In other words the intersection C' lies on the same ray from the origin as the long-run equilibrium C that was attained under fixed exchange rates.

It is clear that a currency appreciation is required, while the nominal price of non-tradeables may be lower or higher than at the initial equilibrium. We can use the Equations (1), (4) and (5) to compute the effects of an increase in g on p_n and e.

These effects are as follows:

$$dp_n / dg = -\Omega\{[(M / P^2)\Phi_2(D_{n2}Y_g + D_{n3}L_1Y_g)] + L_1Y_g[(Y_n'\Phi_2 / p_n) + (D_{n1} / e)]\}$$

which is of ambiguous sign.[8]

$$de / dg = \Omega\{[(M / P^2)\Phi_1(D_{n2}Y_g + D_{n3}L_1Y_g)] - L_1Y_g[(Y_n'\Phi_2 / p_n) + (D_{n1} / e)]\}$$

which is negative, where

$$\Omega^{-1} = (M / P^2)(\Phi_1 + \Phi_2)[(Y_n'\Phi_2 / p_n) + (D_{n1} / e) + (D_{n2}Y_{pn}) + L_1D_{n3}Y_{pn}]$$

This determinant is negative on the basis that the NN curve is upward

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7.   Under flexible exchange rates the nominal interest rate can deviate from rates prevailing abroad by the exchange-rate depreciation expected. As Neary (1985, footnote 25) argues, however, this will not affect the analysis. It merely makes the MM curve more steeply sloped. With the expected exchange rate change proportional to the gap between the long-run and the current exchange rate, a given increase in e not only lowers the real money supply but now also lowers the interest rate, increases the demand for money, and so requires a larger fall in p_n to restore money-market equilibrium.

8. Y_g is the partial derivative of Y with respect to the capital grant, which is positive.

This determinant is negative on the basis that the NN curve is upward sloping, i.e., that a rise in p_n creates an excess supply of non-tradeables and an increase in e an excess demand, or, in other words, that substitution effects dominate income effects.

From these results, using Equation (3) we can compute the effects of an increase in g on the overall price level, P, and thus on the nominal wage, w, when real wages are constant.

It is easily verified that

$$dw / dg = dP / dg = -\Omega(\Phi_1 + \Phi_2)L_1 Y_g [(Y_n{}'\Phi_2 / p_n) + (D_{n1} / e)]$$

which is negative.

It is clear, then, that problems are going to arise in this case. The nominal wage must fall for the real wage to remain constant. Downward rigidity of the nominal wage therefore means that real wages will rise, exerting downward pressure on employment.

In addition, however, the capital grants programme exerts upward pressure on employment in M. It is unfortunately unclear which of these effects will dominate.

Under the nominal wage rigidity/flexible exchange rate case, the effects are as follows:

$$dp_n / dg = -\Omega^* \{[(M / P^2)\Phi_2(D_{n2}Y_g + D_{n3}L_1 Y_g] + L_1 Y_g (D_{n1} / e)\}$$

which is again of ambiguous sign.

$$de / dg = \Omega^* \{[(M / P^2)\Phi_1(D_{n2}Y_g + D_{n3}L_1 Y_g)] - L_1 Y_g [(Y_n{}'w / p_n^2) + D_{n1} / e)]\}$$

which is again negative.

$$\Omega^{-1*} = (M / P^2)\{(\Phi_2)[(Y_n{}'w / p_n^2) + (D_{n1} / e) + (D_{n2}Y_{pn})] + \Phi_1[(D_{n1} / e) - (D_{n2}Y_e)]\}$$
$$+ L_1\{Y_e[(Y_n{}'w / p_n^2) + (D_{n1} / e) - (D_{n3})(M / P^2)(\Phi_1)]$$
$$+ Y_{pn}[(D_{n1} / e) + (D_{n3})(M / P^2)(\Phi_2)]\}$$

which is again negative under the conditions discussed in the text.

It is now apparent that overall employment can fall. This is particularly likely if dp_n/dg is negative, since then we will have a fall in employment in both non-tradeables and in indigenous manufacturing. This is more likely the stronger the income effects in the money-demand function (since then the increase in g will require a greater overall price fall) and the weaker the income effects in the demand for non-tradeables (which exert upward pressure on p_n).

employment may yet rise because of the expansion of the multinational sector. It seems very likely, however, that indigenous employment loses out more under flexible than under fixed exchange rates.

IV CONCLUDING REMARKS

Even ruling out the possibility that indigenous manufacturing and multinational companies compete for scarce factors of production, we find that the inflow of multinationals would crowd-out indigenous industry. This occurs through the "spending effect" familiar from Dutch-disease models. During the period when the exchange rate was linked to sterling, however, the increase in non-tradeables employment would have been greater than the decline in indigenous manufacturing, so our model does not support the proposition that the programme of attracting multinationals reduced aggregate employment.

Our model does suggest, however, that the policy could have had less benevolent consequences in the era of greater exchange rate flexibility. This is because in this case the multinational inflow is associated with a strengthening of the currency rather than an overall surplus in the balance of payments (the "liquidity effect" in the Dutch-disease literature). This strengthening of the currency could be compounded by a further deflationary shock, i.e., a fall in the equilibrium price of non-tradeables. If the deflationary shocks meet with a downwardly-rigid nominal wage, unemployment *may* increase. (The caveat is required because the multinational inflow, *ceteris paribus*, raises employment.) Even if nominal wages become more flexible over time, long-term unemployment can rise if hysteresis is present (Barry, 1994b).

Besides the Dutch-disease model focused upon here, there are a number of other mechanisms that could underlie the apparent crowding-out of indigenous manufacturing employment by multinational companies that was graphed in Figure 1. These are discussed in some detail in Barry (1994a) and in Barry and Hannan (1995).

One possibility is that barriers to entry inhibit the success of indigenous companies in the international marketplace, so that, unlike the multinational companies, they cannot be expected to prosper under free trade in the absence of targeted intervention.[9]

A second possible explanation for the relationship depicted in Figure 1 is that the capital grants and tax concessions awarded to business have raised the overall tax burden on labour, giving rise to a situation where, to quote an OECD report from 1986, "no other country had a tax/subsidy system as

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9.   This argument is associated in Ireland particularly with O'Malley (1989).

biased against the use of labour as Ireland's". [10]

A third possibility is that the influx of multinationals may have distorted wage-setting behaviour, and thereby worsened unemployment. Again there is some prima facie evidence for this. Irish wages and salaries per worker (relative to the EU average), for example, have kept pace with the rapid productivity growth that stems largely from the multinational sector. [11] Furthermore, average earnings grew at the same rate in Modern and Traditional Industry between 1980 and 1992, while output per head increased much more rapidly in the modern sector; Barry (1994a).

It is interesting to note that this element of the crowding-out hypothesis, whereby a booming sector distorts wage-determination processes and may thereby raise unemployment, has also been noted in the Dutch-disease literature. Nankani (1979), for example, cited by Corden (1984), argued that high real wages in the minerals sector of a number of developing countries spread to the rest of the economy in spite of some degree of wage dualism and low employment levels in minerals, and overall unemployment worsened.

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10. Honohan's (1995) numbers make clear, however, that the grant cost per job is well below the tax revenue paid by an average industrial worker over the lifetime of an average job (and this ignores savings on social welfare payments). It is much more difficult to calculate the net impact on the tax burden of the low rate of corporation tax payable.

11. Thus wages and salaries per worker rose from 72 per cent of the EU average in 1973 to 94 per cent in 1991, while productivity (GDP per worker) rose from 66 per cent to 90 per cent over the same period.

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