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GAINS FROM TRADE - A THEORETICAL OUTLINE

by Vivienne Wallscourt

IT IS POSSIBLE to present several economic theories which seek to "prove" that free trade benefits all countries and possibly all individuals. However the worker is unlikely to have more than a rudimentary knowledge of economic theory and it would be tempting to present him with simplified theories without mentioning their limitations. This approach shall be avoided and I shall attempt to present a reasonably realistic description of the benefits of free trade.

THE HISTORICAL DEVELOPMENT OF TRADE THEORY

The idea that multilateral trade is undesirable, and that exports should be maximized and imports minimized in order to create a balance of payments surplus, corresponds to the Mercantilist view of international trade, which saw it as a zero-sum game in which one country gains at the expense of the other. Thomas Mun summarised the idea when he said "the balance of our foreign trade is the rule of our treasure". This theory was basically flawed. Hume has shown that a balance of payments surplus cannot be sustained indefinitely [1] as rising prices caused by an expanding money supply will lead to a decrease in exports and an increase in imports. Adam Smith attacked mercantilism further, pointing out that the principal benefit from trade was not the accumulation of gold but the ability to export goods which had a low demand domestically but were desired by foreigners who would pay a higher price for them. This "rent for surplus" could then be used to import goods which could be produced more efficiently abroad. A further advantage of foreign trade would follow from the enlarged market which it would provide allowing for division of labour and specialisation. The domestic economy would become more productive and wealth would be increased.

Ricardo further developed the theory of international trade describing the gains from trade in terms of comparative advantage [2]. This theory states that it benefits a country to export the good which it can produce relatively more cheaply and to import the good which is relatively more expensive. Ricardo demonstrated this theory in a simple model involving two countries, England and Portugal, producing two goods, cloth and wine. The model involves six assumptions: (1) A labour theory of value (2) Constant returns to scale (3) A close relationship between labour inputs, costs and prices (4) domestically mobile and internationally immobile labour (5) perfect competition and flexible prices and (6) full employment. The

following table shows the opportunity costs involved in the production of each good in terms of the other:

Opportunity Costs for:	Wine	Cloth
Portugal	80/90 = 8/9	90/80=9/8
England	120/100 = 6/5	100/120=5/6

Portugal has a comparative advantage in wine production as the opportunity cost of producing that good in Portugal is lower than if it were produced in England. Similarly, England has a comparative advantage in cloth production [3]. If Portugal can buy cloth for less than 9/8 units of wine and if England can buy wine for less than 6/5 of cloth trade is mutually beneficial. Therefore, if the price of wine is between 8/9 units of cloth and 6/5 units of cloth, England and Portugal will trade. As long as the opportunity costs of producing at least one of the goods differ, trade will occur. Both countries can move resources into the industry in which they have a comparative advantage, increasing production of that good, which can be consumed domestically or exported. Cheap foreign goods can be imported, thereby reducing price, rather as if improved technology had reduced costs and prices. Therefore, Ricardo saw this type of price reduction as being equivalent to a productivity gain through improvements in technology.

The Ricardian model appears very appealing but it has several limitations.It ignores demand factors, it ignores the role of capital and any factors of production other than labour, it assumes that labour is homogenous, it describes static rather than dynamic comparative advantage and it treats income distribution effects inadequately. If an unemployed Portugese clothing worker could move effortlessly into the wine industry, as he might assuming full employment, he would probably be quite content with the Ricardian explanation of the gains from trade. However, if he remains unemployed and impoverished, he is likely to become disillusioned with the model.

Factor Price Equalisation and Hecscher/Ohlin/ Samuelson

A more sophisticated, although still simplified model is provided by the interlinked Factor Price Equalisation and Heckscher-Ohlin-Samuelson (HOS) theorems. The theorems assume (1) that there are two countries, two goods-X and Y and two factors of production-capital and labour (2) identical production functions in both countries (3) constant returns to scale (4) perfect competition (5) no factor intensity reversals between X and Y (6) no specialisation (7) perfect mobility of factors internally and no international mobility (8) zero transactions costs internationally. These assumptions imply a unique correspondence between the marginal products of capital and labour in both industries and as with free trade both countries will have the same relative product prices [4]. We are able to state the

factor price equalisation theorem: with free trade the prices of factors (in terms of goods) will be equal in every country. Furthermore, it is factor prices, when given, that determine the capital labour ratio (K/L) in each industry and if we assume the K/L ratio for the whole country is given, this determines the product mix. If, for example, K/L is low, the country is labour intensive and according to the HOS theorem, it will produce and export relatively more of the labour intensive good, having a comparative advantage in this good. The theorem assumes identical homothetic tastes in both countries so that tastes do not influence trade patterns. This assumption is made in order to show that it is not differences in taste which provide the incentive to trade, but differences in factor endowments.

It must be said that even without the aforementioned assumptions of HOS, that any competitive world equilibrium would be fully efficient if all countries were free to do the best they could, given their initial factor endowments and prevailing world prices. But the Factor Price Equalisation and HOS theorems demonstrate a further benefit of free trade; trading goods can equate the value of the marginal product of a factor in all its uses worldwide, ensuring efficiency and rendering mobility of capital and labour unnecessary. There may be obstacles to free movement of labour and even of capital in the real world and movement of goods can act as a substitute for movement of factors.

International Trade and Income Distribution

We may now present a diagram (see figure 1) illustrating the gains from trade in the context of HOS theory. We assume that a worker lives in a small country such as Ireland which produces two goods, labour intensive clothing (good x) and capital intensive electrical goods (good y). If the country initially operates under autarchy, it will be in equilibrium at a point such as P, C where it both produces and consumes. The country is then exposed to free trade at relative world prices (Px, Py). The consumption possibility set is no longer bounded by the production possibility frontier (F'F") because if domestic production moves to point P', to take advantage of Ireland's comparative advantage in Y, Y may be exchanged for X at the rate Px/Py and the new consumption frontier of the economy is given by T'T", the line through P' with slope Px/Py. At P' the domestic marginal rate of transformation (DMRT), equals the world price ratio (i.e. the MRT through foreign trade (MRTF)). Production must be efficient to maximise world GNP and this happens when domestic prices Px/Py are equated with world prices. Therefore we have efficiency in an open economy when the following condition holds: MRT = Px/Py = Px/Py = MRTF.

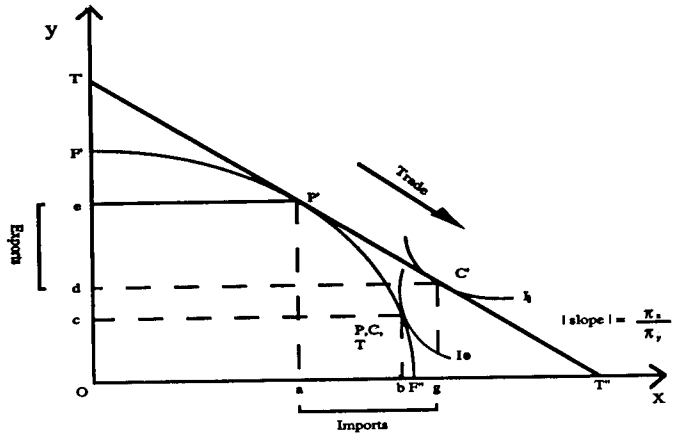

Figure 1: One Country's gain from Trade

It is now possible for the well being of both capital and labour to be improved if the economy operates at a point such as c' where an indifference curve (I 1) is tangent to T'T''. I is higher than Io which was tangent to the original point of productions. P,C so welfare has obviously improved. Production of good y has increased from oc to oe. A quantity equal to de is exported while domestic consumption of y increases by cd. Domestic production of x decreases from ob to oa (leading to the redundancy of our unfortunate worker, due to the contraction of the domestic clothing industry) but domestic consumption of x also increases as Ireland imports ag, increasing consumption by bg.

However, although the country as a whole gains from trade it is not clear whether labour will benefit, for according to the Stolper-Samuelson theorem, if cheap imports of good x enter the country, this will lower the domestic price of x, the labour intensive good relative to y, the capital intensive good which is exported. Due to the relation between factor and goods prices, the returns to capital and labour alter in the same manner. Thus while the welfare of capital increases, that of labour declines,with a lower wage rate prevailing.

In theory, it should be possible for those who have gained from trade to compensate the losers. As it is extremely unlikely that private capital owners will start handing out money to labourers while receiving nothing in return, this requires government intervention. It will no doubt irritate those who believe in free competition, that free trade in international markets is seen to be justified only by government intervention in the domestic market. If factors were in fixed supply, one could impose a tax on capital in order to subsidise labour and such a lump-sum transfer would have no efficiency cost. However in reality factors are not fixed and such a transfer will alter behaviour causing market distortions with resultant efficiency costs.

Figure 1 shows how trade lovers may compensate trade haters. The ordinal utility levels of two representative citizens, person 1 and person 2, are shown on the horizontal and vertical axes. Point d represents trade under autarchy, ef, represents the free trade social utility frontier and as, apart from the arc of intersection, it lies outside the autarchy frontier pq, we can see that consumption can be increased for the country as a whole. At the post trade point v person 1, the capital owner is much better off than under autarchy while person 2, the clothing worker has lost from free trade. If lump sum transfers are allowed, it is possible for full compensation to take place so that a point such as h, north-east of d, may be reached where both individuals are better off than under autarchy. However, if ideal lump sum payments are not feasible and we have Bergson social welfare contours such as w1 and w2, which favour the loser person 2, then redistribution may be harmful. We are now restricted to the feasibility locus Vg, which is inside ef and could even hoop inside point d. Therefore we end at a point such as C where person 2 is better off than person 1, but the economy is less efficient than under autarchy. It is unlikely that the government would sacrifice the gains from trade to compensate clothing workers and so, in this situation, it is unlikely that such redistribution will take place. Our clothing worker would have to suffer for the gains to the economy as a whole

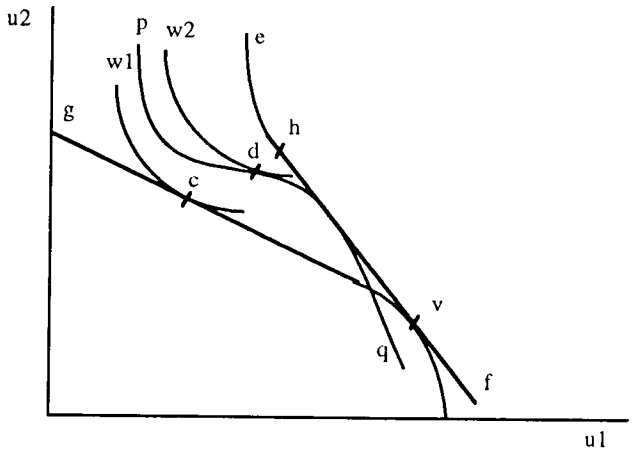

FIGURE 2

Other Gains from Trade

However the worker may be interested to know that not all gains from trade arise from comparative advantage and the Ricardian and HOS approaches do not provide an explanatory framework for all trade. If the assumptions of HOS are violated, in particular the relation of factor abundance to autarchy factor price ratios, and the assumed shapes of production functions, the theorem may fail to hold, or in some cases become completely meaningless.

Of the non HOS explanations for trade, the one most likely one to have relevance for an unemployed manufacturing employee is the theory of intra-industry trade. In the context of a market characterised by imperfect competition intra-industry trade can be generated by scale economies which increase efficiency of production. In this situation each country produces only a subset of the products of a given industry, being a net exporter in industries in which it has a comparative advantage, but also importing produce of that industry i.e. it engages in intra-industry trade. This type of trade is likely to occur if factor endowments and industry structures are similar.

This is likely to describe trade between developed countries. Labour will still be in demand and its price will not fall. It is possible for all factors to gain from trade. The worker rendered redundant by imports may find it relatively easy to find employment in another branch of the industry at home or he may seek employment abroad, as the model allows for mobility of labour.

International trade can lead not only to static production and consumption gains but also to dynamic gains from economies of scale, product differentiation and x-efficiency, from the learning curve effect and from innovation and technical progress. Free trade can play an important role in promoting competition and it can increase the variety of products available to consumers. In Eastern Europe international trade has provided a source of reference prices for countries whose prices did not reflect true domestic costs when they operated under the communist system. Trade has also provided an incentive for such countries to improve the quality of their produce where previously they were able to foist dreadfully inferior goods on their neighbours.These examples serve to illustrate how extensive the gains from trade can be in certain circumstances.

Conclusion

So what does this imply about the consequences of free trade for a former worker in an industry which has been closed down due to competition from cheap imports. As the previous discussion shows, this question cannot be answered simply. It depends on what type of trade is involved and whether or not compensation is possible or desirable. It is also possible that free trade may lead to economic growth which will increase demand for all factors of production and provide

employment for the worker. In any case, whatever his own situation it is to be hoped that the worker will see that free trade has benefited his country in the aggregate and that it can be Pareto optimal with significant benefits for all.

NOTES

(1) Asuming full employment and the absence of investment ahead

(2) Smith referred only to absolute advantage

(3) It does not matter that Portugal has an absolute advantage in the production of both goods.

(4) This can be shown using an Edgeworth-Bowley Box diagram

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BUILDING ECONOMICS: THE USE OF ECONOMICS IN THE BUILT ENVIRONMENT

by Gary Mulligan

IN THIS SHORT report I shall provide the reader with an introduction to some of the principles of building economics. We will begin by taking a look at the development of this fascinating subject.

INTRODUCTION AND BACKGROUND

Building economics emerged as a distinct field in the mid-1970s induced by the so-called energy crisis. Nearly two decades later, it is still in its infancy. The economics profession does not recognize it as a field in its own right even though building is one of the most important activities in any economy.

The "built environment" is the term used to describe buildings, works and other modifications which the human race makes to the natural environment. Shelter costs most households, firms and other organizations significant proportions of their income or revenue and also creates a substantial proportion of their wealth. Since developing and sustaining the built environment is such a large user of resources and creator of wealth, it is not surprising that these activities have a considerable impact on the functioning of the national economy. The scale, quality and distribution of built facilities effects the level of efficiency with which producers of goods and services operate and the quality and shape of the environment in which we live.

Annual national expenditure on the built environment is substantial. Most of the built environment already exists, but annual construction modifies it and can make a profound difference over several decades. Once constructed, built facilities may last for many years, sometimes centuries. Individual developers can generally have little conception of the way in which their development contributes to changes in the built environment, or of what its economic or social consequences will be in the long run. The economics of buildings attempts to remedy this lack of knowledge by integrating and analysing both economic and social interests over the life-cycle of the facilities concerned.

The objectives of practising economists and building economists are different. Put simply, mainstream orthodox economics is the study of how people and society choose to employ scarce resources (which may have alternative uses) to produce and distribute various goods, services and factor incomes. Building

economics is conventionally said (by UK based practicioners) to be about helping clients to achieve frequently mentioned, but rarely defined 'value for money' from their new or rehabilitated buildings. This is sometimes misunderstood to be about cost minimisation. In fact in both public and private sectors it may be said to be about maximising the difference between the cost of the building to the owner, and its value, either in use or exchange. It could be argued that these two objectives are not compatible.

We have now come to a point where we can formulate a definition:

Building Economics is about economizing the use of scarce resources throughout the life cycle of a building. The most "Economic" building is the one that provides the values required at the lowest cost.

The three key words in the discipline are Life-cycle, Value and Cost. Indeed it could be said that it is the relationship between these three concepts which distinguishes building economics from related disciplines. For instance, while there have been subjects which deal with these issues separately (ie.Construction Economics, Valuation, Quantity Surveying etc.) there has been no other subject which has tried to integrate them in a logical, theoretical and yet practical way - until now that is.

THE ECONOMICS OF BUILDINGS: PRINCIPLES

Building economics is concerned with identifying optimal allocations of resources for building owners and developers. However, optimal allocation for an individual vis a vis one project will not necessarily lead to an overall optimum across his or her portfolio of investments, nor will such a local optimum have any direct bearing on the optimal allocation for a society. To put it more simply, decisions regarding the achievement of economy in the built environment must be taken very carefully due to the vast array of complexities that go to make up this environment. In my view, the two main difficulties that arise when attempting to make economic building decisions are those of heterogeneity and subjectivity. No two buildings are the same and peoples needs and tastes in buildings vary greatly. Clearly, this presents problems in attempting to formulate generic techniques for attaining economy across the building realm.We will return to this point later.

The word investment has already been mentioned. This is a very important subject in the study of building economics, for buildings are largely investment goods which are a constituent of real capital. For this reason, the theory of investment and the theory of capital are inextricably linked to the principles of building economics. However, these theories do not give the full picture. As noted by Bon: "Thus far building economics has applied standard investment decision criteria to buildings as a special class of capital assets. However, this approach is

largely ad hoc and the theoretical foundation is still lacking". He continues to say (and I agree with him) that without a clear link to economic theory, building economics will neither develop beyond a narrow domain of project evaluation (including capital budgeting and cost benefit analysis) nor gain recognition as a field of economics proper. While there are many texts on the techniques of building economics, there are very few on the underlying principles.

Time Profiles and Intertemporal Choices

The literature on 'cost planning' which grew up in the UK in particular during the 1960s was, and to a large extent still is, primarily focused on the planning of capital cost. In the early 1960s the professional institutes of architecture, engineering and surveying adopted specific procedural approaches to cost planning. These are now fully incorporated into professional practice and are used by design teams to plan and control the capital cost of building. Standard texts on the techniques of building economics include chapters on life-cycle/cost-in-use techniques.

However, the predominant perspective of building economics taken by the industry professionals is still concerned primarily with the initial cost of the building, with often little more than lip service being paid to life-cycle approaches in the UK. The practice of building economics is, in this respect, more advanced in the USA where some form of discounted cash flow life cost-benefit appraisal is required for all public sector building decisions. Reasons for agreeing in principle but not actually carrying out life cost analysis are usually to do with lack of data on running costs; failure rates and replacement cycles; the 'impossibility' of predicting the future; arguments over interest, discount and inflation rates and the tendency for decision makers to overvalue the present. This lack of application in practice is rather surprising considering the increasing evidence that the time-adjusted subsequent running, occupation and functional use costs of buildings may dwarf the initial capital costs.

If we are seriously concerned with the economic use of resources in the production and in the use of the built environment then we must take as our starting point the life cycle of the built asset. In effect, our economic model must encompass all of the costs and benefits extending over its economic life. Conceptually, this can be ex-post as an historical account or ex-ante as a tool for planning and making decisions among competing alternatives. As building economists, not historians (or accountants) we are naturally concerned with the latter case. This view has been proposed by Bon(1989) in the form illustrated below which constitutes an intertemporal input-output profile for a typical building.

The fact that there are difficulties in estimating the actual magnitude of the cost or benefit flows is not sufficient reason to ignore them completely or to confront them only in the presence of perfect information or of specific client pressure. At the end point (right hand side) of the diagram the input-output profiles intersect. This point marks the end of the economic life of the building. The benefits (outputs) derived from the production process, of which the building is a part, no longer exceed the costs (inputs) to that process. If the building remains in use after this point, it will involve a net loss to the owner. This of course is a theoretical optimum. In practice the building may have a shorter or longer life.

Buildings are long-lived capital assets. The period between decision and action, inception and occupation, use and obsolescence is rarely measured in months, usually in years or decades and occasionally in centuries. More than in almost any other aspect of human activity, time is central to the design, production and use of the built environment. The passage of time is intimately connected with social and environmental change. On a philosophical note changes in the built environment over time are one of the ways in which we gain clues to our past and its relationship to our present. These are notions which are critical to our sense of self.

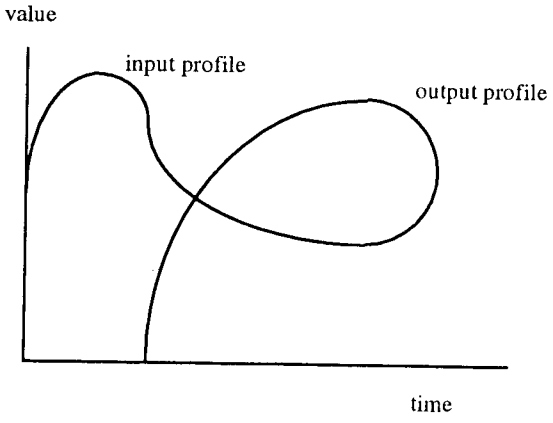

Figure 1

The time dimension has traditionally been neglected in the writing on building economics. Where it has been treated, it has usually been in the narrow realm of comparative 'cost-in-use' or 'life-cost' studies. Investment appraisal techniques which take into account the time value of money are well-known and are applied in the appraisal of construction projects.

Firstly, investment appraisal techniques which take account of the time dimension have been adopted and used in a rather ad-hoc fashion by building

professionals. Secondly, the techniques themselves are subject to criticisms, in particular due to their psychological assumptions regarding preferences as regards the future and thirdly, the recognition of the centrality and pervasiveness of the time dimension leads logically to an entirely different approach to the subject of building economics. Namely, we are forced to concede that there is little basis for deterministic plans and forecasts in an endeavour which takes place over a long time-frame in an economic environment which is itself volatile.

CONCLUSION

The fragmentation of the building professions, the building process, and the built environment is one of the fundamental problems affecting the building industry today. The underlying interconnections require systematic analysis. Building economics may not remedy all that ails in the building industry, but it may be used to diagnose what is happening around us. An economic understanding of building activity as a whole is a precondition for further improvements in economizing the use of building resources. One of the main tasks of building economics is to explain the economic causes and consequences of human action, as manifested in the built environment. Building economics provides a unifying framework for the study of building as a rational and purposeful human activity.

Buildings undergo continual alterations as they are adapted to the needs of their owners. In turn, these needs evolve in a response to continually changing economic conditions. As these changes cannot be fully foreseen, buildings must be designed and constructed so they may be adapted to a wide range of conditions that may be encountered in the underlying economic process.

The contribution of the economist so far to the problems of the building process has been small and mainly in the field of the macro-economics of the construction industry. Other large areas which should interest the economist are the economics of planning, of design, of sites and of maintenance. Economists have barely touched the realm of the built environment, although it should be an area in which they could give substantial help. After all it possesses all the ingredients (i.e.scarce resources, alternative uses and a wide area of choice) which makes economic analysis useful.

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THE THERMODYNAMICS OF PRODUCT DIFFERENTIATION

by Raymond Russell and Alan White

INTRODUCTION

THE ASSUMPTION of homogeneous products which is widely employed in models of perfect competition is not generally applicable. Products are differentiated and it is reasonable to assume that consumers have preferences distributed across the characteristic space. A firm thus has an incentive to differentiate products in order to act as a monopolist and insulate its own market to mitigate the possibility of unbridled price competition. Thus, an increase in the degree of product differentiation can lead to a greater degree of market power; albeit over an restricted market.

Given the importance and significance of product differentiation it would seem timely to develop formal models to trace the extent to which products become differentiated and analyse the extent to which product diversity is optimal. Of significant importance are the economic applications, if any of these models. Hotelling began this problem with his linear city model. In this paper we extend the basic Hotelling model of product differentiation. The motivation, it will be seen, comes from an analysis of a physical analogy. The model will demonstrate that the import of the parallel from physics is useful in analysing the problem.

HOTELLING'S LINEAR CITY

Some of the fundamentals of Hotelling's model are presented here. We note firstly that Hotelling's model of product differentiation is an abstraction of reality and involves a number of simplifying (and perhaps) unrealistic assumptions. He envisaged a bounded linear city (street or market) along which customers were uniformly distributed. Two firms supply the market, have a constant and common marginal cost of production of c and face an inelastic demand. Consumers face a linear transportation cost of £t per unit distance travelled along the linear market. Thus the cost to a customer located at x; of one unit of firm i's product (whose location is a) is given by the delivered price; that is:

$$p_i + t|x_i - a|.$$

No customer has any preference for either firm except on the grounds of price plus transportation cost. In general there will be many causes leading particular classes

of buyers to prefer one seller to another, but the ensemble of such considerations is symbolised in the transportation cost. In this paper we draw attention to the location game of the two forms; that is, if prices were fixed, where would the two firms optimally locate in order to maximise profits?

We consider one aspect of Hotelling's model in this paper - namely the location game of the firms, with given prices. If firms face a fixed common price £p Hotelling showed that a Nash equilibrium would prevail in which both firms would locate at the same point on the linear city - namely at the centre. Both firms thus maximise the pool of potential consumer surplus available to them by locating at the centre of the market. However distance along the linear market is just a figurative term for a product characteristic - it represents a dimension of characteristic space, as Hotelling noted. Thus firms tend to locate at the same point in characteristic space (given prices). Consumers are confronted with an excessive amount of similar products: this became known as Hotelling's Principle of Minimal Differentiation .

PHYSICAL MODEL

We sought to extend Hotelling's original model by generalising some of his assumptions, and, due to the complexity of the problem, chose a computational rather than an analytical approach. Firstly, we wanted to examine a characteristic space of higher dimension and so we took the modest generalisation of two dimensional space, and limited it by considering only a finite square area. Secondly, we wanted to examine the behaviour of the market when, instead of just two companies,we have several companies in competition, although we had to restrict ourselves to considering just three due to computational limitations. Finally we dropped the assumption of a uniform population distribution over characteristic space, and ultimately chose one that was quite simple but realistic. It consisted of two Gaussian peaks of the same variance but different heights, representing, in a geographical interpretation for example, two different cities:

$$\rho(x,y)=3e^{-\frac{1}{2}\alpha((x-x_a)^2+(y-y_a)^2)}+e^{\frac{1}{2}\alpha((x-x_b)^2+(y-y_b)^2)}$$

where (x_a, y_a) and (x_b, y_b) are the coordinates of the centres of the peaks. We expect a priori the compaies to locate at or near the peaks in order to maximise their shares of the market and to service the demands of the consumers there.

We assume that each consumer purchases one unit of each good, and that each acts independently of the other, the only criterion used being the amount of utility derived from the product being purchased. Like Hotelling, we assume linear transportation costs for simplicity, so that the utility a consumer at (x,y) derives from company k located at (x_k, y_k) is

$$U_k = s - p_k - t\sqrt{(x-x_k)^2+(y-y_k)^2}$$

where s is the gross surplus, is the price charged by company k for its product, and t is the fixed linear transportation cost. Each consumer only purchases once, and thus wants to do so from whichever company maximises their utility. However, in the case where two companies offer the same maximum utility the question arises (even if only in the context of finding an algorithm for the computational experiment) as to which company the consumer actually buys from. Even if there is a difference in utility one might expect the consumer to be indifferent to it, if it is sufficiently small, and only to be swayed by it if it is significant compared to other randomising factors, such as convenience or habit.

The answer we chose is motivated by thermodynamics. A physical system typically has a range of behaviours available to it, each characterised by an energy, and the most stable configuration is the one of lowest energy. A thermodynamical system is one made up of many identical systems acting independently, or only loosely coupled, and such systems tend to emit energy in order to settle into their lowest energy, or ground state: for example the atoms in a laser that are excited by optical pumping will drop to their ground state by emitting light. However if a configuration exists with energy close to that of the ground state, then the system will not discriminate between them, and at equilibrium will be almost equally likely to be in either state. If the difference in energy between them is DE, then the ratio of the probabilities of occupancy of the ground state and the excited state, p_0 and p_1 respectively, is given by the Maxwell-Boltzmann statistic:

$$\frac{p_1}{p_0} = e^{-\frac{\Delta E}{kT}}$$

If $\Delta E >> kT$ then the system is almost certainly in the ground state, while for $\Delta E << kT$ the system is equally likely to be in either state. In fact T is the temperature of the system, and, in a sense, is a measure of how much random energy is in the system: the higher the temperature the more likely the system is to be in higher energy states, (or more simply, the hotter it will be).

Thus we assume that the consumers purchase according to the Maxwell - Boltzmann distribution, and so the number of consumers at (x,y) who purchase from company k is

$$\rho(x,y)\frac{e^{\frac{U_k(x,y)}{U_0}}}{\sum_i e^{\frac{U_i(x,y)}{U_0}}}$$

where U_0 is a critical utility differential, analogous to the temperature of a thermodynamical system. Notice that if U_0 is zero, each consumer simply chooses the cheapest company for them. To find the total demand D_k for each company we add up the the demand from the whole population by integration:

$$D_k = \int\int \rho(x,y) \frac{e^{\frac{U_k(x,y)}{U_0}}}{\sum_i e^{\frac{U_i(x,y)}{U_0}}} dxdy$$

Note that:

$$\sum_j D_j = \int\int \rho(x,y) \frac{e^{\frac{U_k(x,y)}{U_0}}}{\sum_i e^{\frac{U_i(x,y)}{U_0}}} dxdy$$

so the total demand is simply the total population, since each consumer buys one unit. Finally, to determine the equilibrium condition we again appeal to physical analogy and take it to be the maximisation of the following

$$I = \prod_i \Pi_j$$

where p_i is the profit of the ith company. For a fixed price, common to all companies, profit is proportional to demand, and so

$$I = \prod_i D_i$$

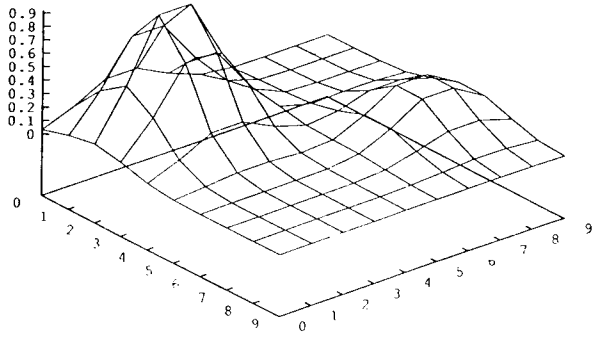
Experience guided us to use a Monte Carlo technique rather than a dynamical one to find the equilibrium configuration: we selected a random location for each company and calculated the quantity I above. That configuration was then given a corresponding weighting and the process was repeated until a significant portion of the total possible configuration space was sampled. Due to the length of time needed for each calculation of I we had to discretise the characteristic space into a square grid of one hundred points and use just three companies, each with a common fixed price for their goods, thus making it a pure location game.

The following code segment is the core of the program, choosing random-configurations, and calculating corresponding demands.

```
for(k=0;k<S;k++)
{for(i=0;i<3;i++)
      { I[i]=random()%100;
            comp[i][0]=point[I[i]][0];
            comp[i][1]=point[I[i]][1];
            comp[i][2]=point[I[i]][2];
                  demand[i]=0; }
      for(i=0;i<100;i++)
```

```
{ for(D=0,j=0;j<3;j++)
{ x=comp[j][1]-cons[i][1];
y=comp[j][2]-cons[i][2];
cos[j] = comp[j][0] +T*sqrt(x*x + y*y)/CO
D+=exp(-cost[i]); }
        for(j=0;j<3;j++) demand[j]+=cons[i][0]*exp(-
cost[i])/D; }
        for(D=1,i=0;i<3;i++) D*=demand[i];
        for(i=0;i<3;i++)
        prob[I[i]]+=D/100; }
```

The results are shown graphically below:



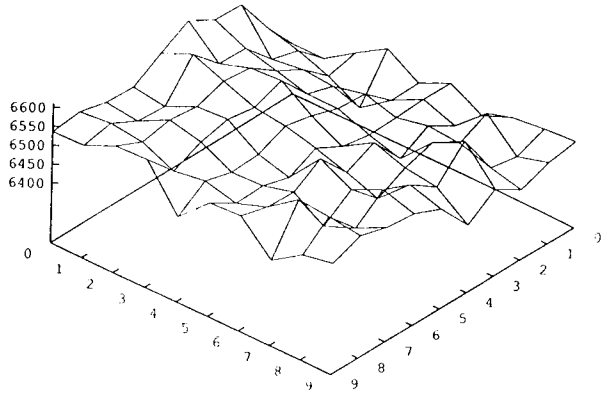


Figure 1 **Figure 2**

Fig. 1 shows the underlying population distribution, representing perhaps two cities, and fig. 2 shows the probability at each location of a company maximising its profits by locating there. This clearly shows that the companies are equally likely to locate at any position in characteristic space. This suggests, contrary to our initial expectations, that there is no 'equilibrium' in this game due to the interdependent reactions among the three companies.

COMMENT

The above model is simple, yet produces results that accord with conventional wisdom. The analogy to physics points to two features in particular that merit explicit mention. Firstly, economics cannot and should not exclude the influence of other disciplines of study. Social, political and other influences have a role to play in shaping the economic environment and the analogy to physics, while not realistic is somewhat illuminating. Secondly, the above analysis raises a methodological issue: namely that economics may be amenable (under restrictive assumptions) to scientific analysis and may make considerable progress if the concepts are suitably adapted to the economic context.

CONCLUSION

The concept of product differentiation is an important feature of the economic climate and the development of formal models attempt to make tractable the features and implications of product differentiation. While the model presented here is simple, we hope that is will empower individuals to view product differentiation from a new perspective and will prove useful in formulating more specific models,ones which better powers of prediction.

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INFLATION IN A SMALL OPEN ECONOMY

by Ian Rowell

THIS ESSAY deals with the determinants of inflation in a small open economy, but I will begin by explaining the importance of price stability to economic theory and policy. Central to the Keynesian-Classical debate is the question of whether, after a shift in demand, adjustment to a new equilibrium is achieved by a change in the quantity of production or by a change in the price level. Keynesians say either that prices will be stable or that most of the adjustment will come from a change in the quantity of output. Classicists postulate that changes in demand will change prices rather than quantities. The crux of the argument is that the authorities may be unwilling to contemplate a rise in short-term production quantities at the expense of price stability, since sustained inflation will eventually damage the long run level of output.

THE COSTS OF PRICE INSTABILITY

The output costs of inflation will vary according to whether it is perfectly anticipated or not. Perfect anticipation comprises accurate prediction of the inflation rate together with the indexing of all nominal sums mentioned in contracts. Here there are two main output costs. Firstly menu costs are attached to changing prices, especially when inflation is high. Secondly, the price mechanism is weakened. What makes markets efficient is that they allocate through relative price changes, directing producers to produce more of a popular good and directing consumers to buy where goods are cheapest. Inflation, which is a rise in the general level of prices, obscures these changes.

Unanticipated inflation, as well as the latter two output costs of anticipated inflation, has a further output cost due to the uncertainty which it causes about future prices. This hampers decision making. Fewer fixed price orders will be placed or accepted if the future rate of inflation is unknown. This uncertainty means that planning will be hampered and investment will fall. More will also be invested in inflation hedges like gold rather than in productive assets. Moreover inflation means a loss in competitiveness for the open economy unless it is offset by a change in the exchange rate. But when the rate of inflation is unknown, the exchange rate change is unlikely to be accurate.

Unanticipated inflation also effects equity, since it redistributes income and wealth. Firstly, it transfers money from the private sector to the public sector as tax bands are unindexed. A rise in nominal income (with no rise in real income) where

tax bands are unchanged means a larger fraction of real income will be taxed at higher or marginal rates. Secondly, if borrowing and lending are done on fixed nominal rates, inflation will redistribute money from borrowers to lenders, (i.e. the real interest rate is a negative function of inflation). Thirdly, those on flexible incomes do better than those on inflexible incomes, such as state pensions, which are adjusted only after a large lag. The elderly, who are both net creditors and living on inflexible incomes are particularly hurt by inflation.

Inflation in the Context of a SOE with Fixed Exchange Rates

So given that price stability is desirable as a secondary policy objective, (i.e. as a means to the end of higher output and a "fairer" income distribution), the question moves on as to how it can best be achieved. The Keynesian-Classical debate summarized above is not really relevant to policy makers in the small open economy, as demand policy is outside of their control. However inflation can still be largely determined by the choice of exchange rate regime.

In a small open economy with a fixed exchange rate, the price level depends on that abroad, according to purchasing power parity (PPP) theory. The economy's openness means that the traded sector forms a large part of national income. A price rise in the traded sector means a similar rise in the domestic price level. Consider the case where the world price level exceeds the domestic price level, and the two cannot be equalized by a currency appreciation. Home producers will export more, which reduces supply and pushes up domestic prices. The country will not be able to import if higher prices can be fetched abroad, so prices will rise. The converse occurs where domestic prices are higher than foreign prices. Price level movements in the non-traded sector will follow those in the traded sector where the economy is small for two reasons. Firstly, price rises lead to higher wage claims across all sectors. Secondly, the price of intermediate goods will rise.

A weaker form of PPP theory accounts for movements in inflation. It says that the rate of change in world prices, or

$$\pi_d \text{ (domestic inflation)} = \pi_w \text{(world inflation)} + e \text{ (\% exchange rate)}$$

where the exchange rate is fixed, $e = 0$. But you cannot fix the exchange rate to a world currency. If it is fixed to that of country 1, then

$$\pi_d = W_1\pi_1 + W_2(\pi_2 + e)$$

Where the rest of the world is country 2, e is the percentage exchange rate between countries 1 and 2, and the Ws are weights summing to one and indicating the share of trade with those countries. If PPP theory holds between the country to which the SOE is pegged and the rest of the world, then

$$\pi_d = W_1 \pi_1 + W_2 \pi_2 \text{ as } \pi_1 = \pi_2 + e$$

or

$$\pi_d = (W_1 + W_2)\pi_1 = \pi_1$$

In other words, PPP theory says that inflation in the SOE is equal to inflation in the country to which it pegs its currency. In this framework, domestic inflationary pressures do not affect the price level except in the short term : they may however effect employment as people shift from Irish to foreign goods, or as firms hire fewer workers.

The Case Of Ireland

Irish evidence suggests that such a relationship existed between Ireland and Britain for most of the sterling link, and between Ireland and Germany in the ERM from 1988 until a few months ago. However the latter link took ten years to be established. Subsequent studies found that there did not exist a strong PPP link between Britain and Germany, which meant that $\pi \neq \pi + e$. This was to be expected since they are both large open economies. In fact Sterling's real exchange rate appreciated over the period, which meant that $\pi + e > \pi$. This did not show up under the Sterling link because when Britain was country 1, W1 was larger than when Germany was country one, and so the lack of a PPP link between the two countries was less important. So if the country is pegged to a large open economy with which only some trade is done, both its inflation and the inflation of the other trading partners will be important. Indeed, Irish inflation in the 1980's can be explained by a weighted average of British and German rates.

Inflation under a Floating Exchange Rate Regime

Where the exchange rate is not fixed, domestic factors become more important. This is because the exchange rate fluctuates to eliminate differences between domestic and foreign price movements; inflation rates themselves do not adjust.

Inflation is now caused by the growth in the money supply over and above output growth. Government monetary policy is determined by two factors : its own fiscal policy and the dangers which a restrictive monetary policy may pose to output. In its fiscal policy, it may seek to appropriate a higher share of national income by increasing inflation without indexing the tax bands. Politically this is less noticeable than an increase in tax rates. It may also try to prevent public borrowing from crowding out the private sector by increasing the money supply. If we assume that money supply follows money demand, then public borrowing automatically increases inflation.

Tight money may cost jobs if wage claims are high. If firms increase prices in line with wages, and the government has not increased the money supply, then

the real money supply and consumption will fall and unemployment will rise. If firms do not increase prices, they will hire fewer workers. The government may be tempted to prevent the fall in consumption by increasing the money supply, which allows the increase in prices to be sustained without immediate output costs. So the government may stimulate inflation to prevent immediate unemployment. The extent of the use of this policy instrument will depend upon the strength of unions to force up wages and their ability to resist the downward pressure which the resulting unemployment may put on wage rates. Another factor is that jobs in inefficient industries are unlikely to be regained after a recession. So the government's willingness to tolerate inflation will depend upon the intensity of labour market rigidities and the condition of a country's industrial base.

Conclusion

So a fixed exchange rate means external inflation rates are the main determinants of the SOE's inflation rate; a flexible exchange rate means that fiscal policy and labour rigidities are the main determinants. But what determines exchange rate policy? Ultimately the authorities. If they choose to fix the exchange rate then it is partly because they feel the economy can adjust to foreign inflation rates without excessively damaging unemployment. So domestic influences on the domestic inflation rate exist indirectly even in a fixed exchange rate regime.

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MARKET FAILURES

by David Butler

THE FIRST fundamental theorem of welfare economics states that under certain conditions an economy with perfect competition in all markets has equilibrium positions; that every equilibrium position is socially efficient, (i.e. Pareto optimal) and that every Pareto optimal situation corresponds to such an equilibrium position.

This exposition is in no way intended as even an approximate description of reality. It nevertheless provides a practical analytical point of departure for discussing a real economy. In other words we can grasp from this piece some of the implications of deviations from the perfect market economy model. The violation of the conditions necessary for a perfect economy, hence Pareto optimality, occur as a result of what are deemed 'market failures'. These phenomena can be categorised into six separate areas. I however propose to examine only four of these areas. Those which I shall not examine, failures arising from information imperfections and market imbalances, whilst being of no lesser importance do not present the same scope for examination.

DECREASING AVERAGE COST INDUSTRIES; ECONOMIES OF SCALE

The assumption of perfect competition used in the first theorem of welfare economics is based on the existence of a large number of firms producing a homogeneous good, each of which produces under decreasing marginal costs. Equilibrium output arises where the marginal cost of production equals the market price for the good. This situation is demonstrated in fig.1 below. The shaded area represents the producer surplus achieved at this output.

However, suppose the firm does not face increasing marginal costs. Assume that in fact it faces decreasing marginal costs. In the real world there are many industries where such a situation arises; technology may be such that average costs are decreasing over a large output interval. The automotive industry is a good example of this. Automation made feasible by the vast quantities of production has reduced substantially the average time, (and hence the average cost) of producing a car. At present the average time taken to produce a family saloon is twelve and a half hours and is falling constantly.

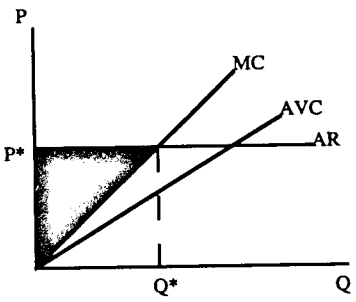

FIGURE 1

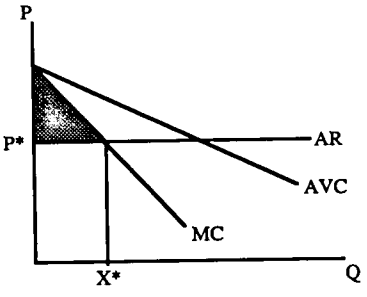

FIGURE 2

Assume constant average revenue i.e. firm is a price taker. A decreasing marginal cost curve and the average variable cost are depicted in fig.2 above. If the firm obeys the Pareto rule for optimality such that price or average revenue equals marginal cost then they will achieve a negative producer surplus. Since they will not even be able to cover their average variable costs they will cease production. Attaining the Pareto optimal level of production X* would necessitate a subsidy, so that the firm breaks even when producing output X*.

In the real world situation, what happens in the case of decreasing marginal costs is that these increasing returns to scale act as a barrier to entry into the marketplace, thus forming a natural monopoly. The question of whether or not the producer will behave in a monopolistic manner, implementing monopoly pricing, is ambiguous since if entry into, and exit from the market place were costless the natural monopolist, fearful of the threat of others entering, may behave competitively.

A natural monopoly may in fact imply a beneficial outcome. For example it is substantially more efficient to have one national postal system rather than a separate system operating in each district. However whilst a monopolistic, decreasing cost producer may be relatively more efficient, if the monopolist implements monopolistic pricing there still exist welfare costs associated with its existence, as I shall now demonstrate.

Monopoly Pricing and the Welfare Loss from Monopolies

The reason for a welfare cost arising from a monopoly is that unregulated monopolies whether natural or otherwise will restrict output in order to attain a higher price. A monopoly producer seeking to maximise profits will produce where its marginal revenue equals its marginal cost. Under perfect competition the production equilibrium will occur where marginal revenue equals the price or

average revenue. However in a monopolistic situation the monopolist faces a downward sloping average revenue curve hence its marginal revenue will be less than its average revenue.

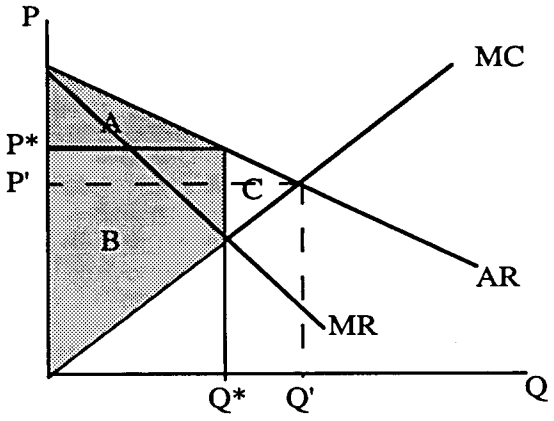

FIGURE 3

As the monopolist increases production, he knows that he must lower his price, since the average revenue or demand curve is decreasing. Therefore he will only produce a quantity equal to Q* above (fig.3) where marginal cost equals marginal revenue, since beyond this point the cost of producing an extra unit exceeds the revenue earned from this good, yielding a loss from the production of the good(therefore there exists no incentive to produce it). The social optimal point on the other hand would be quantity Q', where average revenue equals marginal cost. As can be seen from the diagram this yields a quantity exceeding that of Q*. As a result of the monopolies pricing decision, the output is restricted.Therefore we must ask ourselves what is the welfare cost of this behaviour to society ?

A measurement of this loss can be undertaken with reference to both consumer and producer surplus. The combined total of these at Q*, the monopolists output, is the area A+B. Under the Pareto optimality condition MC = AR output is Q' the total surplus now being A+B+C. Therefore as a result of monopoly production, the loss in surplus, translating to a loss in welfare is the area C.

Again as with decreasing cost, natural monopoly producers, one cannot say unambiguously that a monopolists' pricing decisions will be completely determined on an endogenous basis. Not only may the monopolists be fearful of the entry of others into the market, they may also be fearful of government intervention in the form of maximum pricing orders, or other such means of control. If the government believes that certain producers are exploiting their market position they may very well choose this course of action.

PUBLIC GOODS

The third feature of a real economy which leads to a market failure arises from the existence of public goods. Goods considered in the first theorem of welfare economics are characterised by the property that each unit can only be consumed by one economic agent, they are private goods. However, some goods have the property that when one person consumes them, all people can also derive benefit from them. Unlike private goods their use is non-excludable. The most common example of such a good is national defence. If resident A of a country is being protected from foreign forces then resident B of the same country is also being defended. It would be impossible to protect resident A without protecting resident B.

The second characteristic of a public good is that it does not cost anything extra for an additional individual to enjoy the benefits of the public good. There exists a zero marginal cost for allowing an additional individual to enjoy the good. Falling back upon the national defence example; it costs no more to protect one million and one individuals than one million. Under the conditions of Pareto optimality the producer must produce where the marginal cost equals average revenue, therefore since the marginal cost is zero the price charged should also be zero. However with a zero price and a non zero initial production cost output cannot be determined in the usual manner. Who will supply the good for free?

This would suggest that the market would fail to supply the Pareto optimal quantity of a good whose marginal cost is zero, or in close proximity to it. This provides a rationale for government intervention.

EXTERNALITIES

Finally I turn to the rule of externalities as a cause of market failure. In demonstrating how the market system yields a Pareto optimal equilibrium we assumed that people have selfish utility functions, that is their utility depends solely on their own consumption, and that firms' production decisions are unaffected by other firms' actions. In many cases in real economies these assumptions break down. One can demonstrate numerous examples where the actions of one individual or firm affect the behaviour of other individuals or firms. Instances where one individual's activities impose a cost on others are referred to as negative externalities, when these actions bestow a benefit upon others they are termed positive externalities.

Examining externalities we can observe two manners by which they can arise. Firstly a person's utility may depend upon the by-products produced from other individuals' consumption and which are consumed without choice by the person in question. For example smoking; many individuals' objections to others smoking arise not from the knowledge that the other individual, may be damaging

their own health, but rather due to the smoke which is produced and which they are forced to inhale.

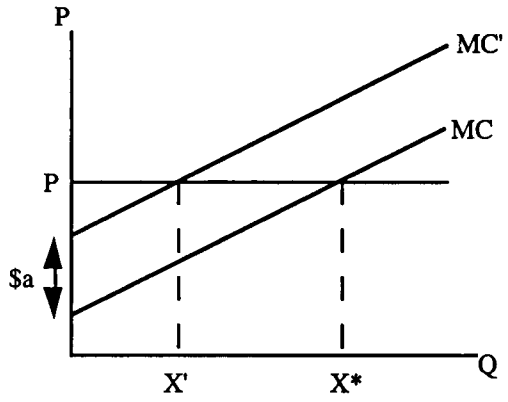

FIGURE 4

The second class of externality is that of reciprocal consumption externalities, often referred to as the problem of interdependent utility functions. Each individuals' utility depends not only on their own consumption bundles but also those bundles chosen by other individuals. An example of this may include jealousy; for instance one individual's utility may be lessened due to envy if his neighbour receives a large boost in income. Conversely compassion may also be cited as an example; a person may suffer a utility loss when he sees the distress which poverty may cause to an other person. However if this characteristic of interdependent utility is introduced into the welfare equation it is possible to justify almost anything, (including severe infringement of an individual's rights simply due to a community's envy) it is therefore, correctly or not, ignored.

To demonstrate how externalities lead to market failure consider fig.4 above. The marginal cost is as normal upward sloping. Assuming that the firm is in a perfectly competitive market and maximising profits, they will produce a quantity X* such that marginal cost equals average revenue. Suppose however in the course of production, the firm emits radiation and that the cost of these emissions in the form of increased medical bills for the surrounding population is $a per unit produced. To obtain the social marginal cost of producing the commodity we must add $a to the producer's (private) marginal cost curve, shifting it from MC to MC'.

Consequently the profit maximising level of production X* exceeds the socially optimal level X'. Hence if permitted to emit radiation the profit maximising firm produces too much of the commodity, the reason being that a part of the real

cost of production $a per unit is an external cost, a cost not recognised by the producer. Since the producer does not bear the full cost of the negative externality which they generate they will engage in an excessive amount of production. In the case of positive externalities, where the firm does not reap the full benefits of the externalities they will engage in too little production.

As a result of the existence of externalities whether positive or negative the allocation of resources, as demonstrated above, need not be Pareto efficient, with the firm either producing too much in the case of negative externalities or too little in the case of positive externalities. This result provides widespread belief that there is a definite motive for government intervention, especially in the case of negative externalities. There are many forms which this intervention could assume. In some cases the government could attempt to regulate the activity in question through the issuing of licences, alternatively they could attempt to use the price system to penalise, perhaps even fine, those producers causing negative externalities.

Conclusion

The preceding text has demonstrated why a real economy may fail to arrive at an equilibrium which is Pareto efficient. The natural implication of this is that there exists a rationale for government intervention in the market place. There exists much consternation as to whether this is a valid approach to take.Firstly one must distinguish between an ideal government and a real government. Whilst an ideal government may be able to intervene and eliminate each market failure, an actual government may have no more information or knowledge about the working of the economy than anyone else would have. Also a question must be asked as to whether the government and their bureaucrats truly do attempt to maximise society's welfare or whether it is their own welfare which is first and foremost in their minds.

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THE CONSUMPTION FUNCTION: A HISTORY

by Brendan Fitzpatrick

THIS ESSAY'S content is, as is suggested by the title, a history of the consumption function. It is a history which treats heavily of the role of the consumption function in the Keynesian economic schema, and provides a detailed and carefully constructed examination of the Keynesian analysis of aggregate consumption, as contained in chapters 8, 9 and 10 of the " General Theory ".

The subsequent refinements to the theory presented by Modigliani and Friedman are characterised as being appropriate responses to empirical evidence yielded by econometric testing of Keynes' theory. Both the Life Cycle and Permanent Income hypotheses are given extensive treatment.The final section examines the application of rational expectations to the consumption function, as embodied in the Surprise Consumption Function of Robert Hall. Theoretical and empirical objections to this model, most notably those of Muellbauer, are then discussed.

KEYNES AND THE CONSUMPTION FUNCTION

The three chapters of book III of "The General Theory of Interest, Employment and Money" are devoted to the consumption function. Keynes defines the propensity to consume as the functional relationship c between Y_w, a given level of income in terms of wage units and C_w, the expenditure on consumption out of that level of income, so that :

$$C_w = c (Y_w). \qquad \text{(equation 1)}$$

This having been established, Keynes notes that the amount spent in an economy on consumption depends on three categories of determinant; the level of income, other objective attendant circumstances and finally a set of institutional and psychological "subjective" factors.

These subjective influences, although Keynes is not sparing in his enumeration of them, however, are exogenous to his analysis, as they are; "unlikely to undergo a material change over a short period of time, except in abnormal or revolutionary circumstances". So for the purposes of his paradigm, then, the propensity to consume is especially dependent on the objective factors, of which Keynes listed six.

Firstly, the propensity to consume will be affected by a "change in the wage unit", as consumption is, strictly speaking, a function of real income. Secondly, it will depend on the difference between income and net income, a relatively unimportant factor. Keynes' third factor was "windfall changes in capital values not allowed for in calculating net income". Keynes classified this as a major factor, and was the basis for his assertion that "consumption of the wealth-owning class may be extremely susceptible to unforeseen changes in the money value of its wealth". The fourth factor, the rate of interest, does not assume the importance assigned to it in Classical and neo-Classical analysis: "There are not many people who will alter their way of living because the rate of interest has fallen from 5% to 4%, if their aggregate income is the same as before."

The remaining influences on the propensity to consume were changes in fiscal policy and "changes in expectations of the relationship between the present and the future levels of income". Of the former we ought to note Keynes' emphasis on it as a means of increasing the propensity to consume, by way of redistribution from rich to poor. Of the latter, we may note in ironic fashion, Keynes' comment that "it is a matter about which there is, as a rule, too much uncertainty for it to exert such influence". It was Keynes' oversight with regard to this factor that would lead to the subsequent modification of the Keynesian paradigm contained in normal income theories.

Having considered the above, Keynes stated that the propensity to consume would be a reasonably stable function, and therefore, that the amount of aggregate consumption would be related in a stable manner to aggregate disposable income. In today's familiar notation :

$C=F(Y)$. (equation 2)

Firstly, we note that the average propensity to consume (APC) decreases as income increases, implying that the marginal propensity to consume (MPC) lies between 0 and 1. For Keynes, this was a: "fundamental psychological law upon which we are entitled to depend with great confidence". Secondly, the APC is greater than the MPC, implying that at some low income level, consumption exceeds income. Thirdly, the marginal propensity to consume itself decreases as income rises, yielding a consumption function such as C1 in figure 1.The radical import of the Keynesian orthodoxy in this regard derives from the very postulation of an aggregate consumption function, whereas none had been explicitly proffered before, and because it is a notable component of his direct confrontation with the Classical view. To see this, we may note briefly the basic tenets of the Classical model.

In Classical theory, supply created its own demand. Consumption, labour, capital, supply and therefore output were planned simultaneously in accordance with preferences and prices. The labour market was the co-ordinating strategic

market of a system whereby household preferences yielded the labour supply function and where the accumulated stock of capital and the technical determinants of production yielded the production and labour demand function. Flexible prices ensured the equating of labour supply and demand at full employment levels. Say's Law held as factor incomes served as demand for the goods produced in the economy. In other words, national income was determined by supply .

Classical economics, therefore, did not require, nor did it have, an aggregate consumption function, only a theory of individual consumption and firm investment, and the Walrasian notion of general equilibrium to ensure the full employment of resources. Were a classical economist to be pressed on the issue, however, he might argue that consumption was dependent on income, the rate of interest, and real balances (the Pigou effect):

$$C=F(Y, i, M/P). \qquad \text{(equation 3)}$$

In Classical economics, however, no stable causality was supposed to run from C to Y. By contrast, C and Y were linked, at a microeconomic level via the budget constraint. Furthermore, as has already been noted, the stress placed on the role of interest rates in determining consumption in Classical theory was very much questioned by Keynes, who argued that the interest inelasticity of consumption might be low, arising from the relevant substitution and income effects cancelling each other out.

Consumption was a component of Keynes' effective demand (the actual aggregate demand for commodities in a closed economy, as opposed to pure wants). It was through the notion of an effective demand, comprised of consumption, investment, and government expenditure, that Keynes' rebuttal of Say's Law was directed. The commonplace empirical contradiction of that law by way of the phenomena of unemployment and recessions were theoretically buttressed by Keynes' arguments to the effect that it was effective demand which determined output, not supply; and that equilibrium could occur at employment levels less than full employment.

Keynes' hypothesis provided impetus for empirical investigation, but the consequent findings did not yield unequivocal verification of the theory. Firstly, shifts in the consumption function observed in a number of post-war studies brought the alleged stability of the consumption function into question. Secondly, while research involving cross-section budget data supported the Keynesian notion of a Consumption function like C1; long-run time series studies, such as Kuznets' famous 1946 study, seemed to imply that consumption was a linear function of disposable income, with a constant marginal propensity to consume, as in C2. This was in direct contradiction to the prescripts of the Keynesian thesis.

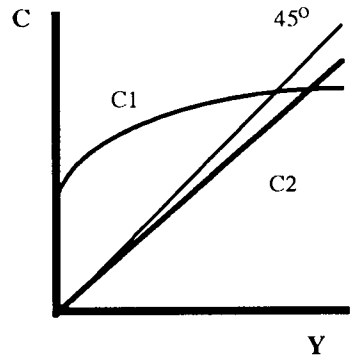

Figure 1: Alternative Consumption functions as implied by different studies.

Duesenberry (1952) provided an early attempt at reconciling the findings by pointing out that relative income, not absolute income, was the relevant concept of income. While Duesenberry achieved a plausible reconciliation of the conflicting econometric findings, he ignored the role of wealth, and its influence on the consumer's expectation of future income. The present consensus is that normal income theories, such as those developed by Modigliani and Friedman, offer a more satisfactory rationale for hitherto observed empirical conflicts (and one which is intuitively more appealing).

Normal Income Theories: Life-cycle and Permanent Income Hypothesis

Modigliani's Life-Cycle Hypothesis (1954) argues that an individual optimizes by maintaining a stable trend path of consumption through his or her lifetime. This is achieved by a redistribution of resources from mid-life ($t_0 t_1$) to early life (0 t_0) and to retirement ($t_1 Y$), by an appropriate use of the capital market for savings and dissavings purposes.

Algebraically, current consumption is a fraction b_t of the present value of total resources V_t accruing to the individual over his lifetime :

$$C_t = b_t V_t \qquad \text{(equation 4)}$$

$$V_t = w_{t-1} + Y_t + \sum \frac{y_t^i}{(1+r)^i} \qquad \text{(equation 5)}$$

w_{t-1} being net worth from the previous period, y_t being current income and

$\sum \frac{y_i}{(1+r)^i}$ being the present value of expected future income from employment over the individual's remaining lifetime n.

Modigliani's reconciliation of cross section and time series data was that the latter captured the long run relationship in equation 4, where b_t was the long run MPC. Cross section budget data would typically capture individuals at different stages of their lives. As is evident from figure 2, in both the young and the old, a coincidence of high MPCs would occur with relatively low income levels, while in middle age, the studies would indicate a concurrence of low MPC and high income.

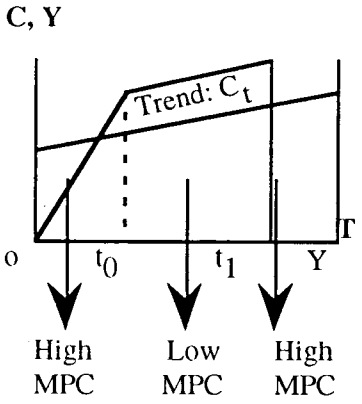

Figure 2: The Life Cycle Hypothesis

Friedman's Permanent Income Hypothesis (1957) argued that permanent consumption was a given proportion of permanent income:

$C_p=kY_p$. (equation 6)

Friedman defines permanent income as the " amount a consumer unit could consume, or believes that it could, whilst maintaining its wealth intact " whereas permanent consumption is "the value of services that it is planned to consume during the period in question".

One of the virtues of the Friedman model was the attention it paid to stochastic variations in income, and their consequent implications for consumer behaviour.Friedman stated that permanent income and consumption bore the following relations to their transitory and measured components:

$Y_p=Y_m - Y_t$ (equation 7)

$C_p=C_m - C_t$ (equation 8)

He further stated that the following correlation co-efficients were equated to zero :

$R_{ypyt}=0$ (equation 9)

$R_{cpct}=0$ (equation 10)

$R_{ytct}=0$ (equation 11)

The first two correlations proffer the self-evident tautology that the transitory elements of consumption and income occur in a stochastic manner.The third correlation seems illogical until we note that since transitory income is usually spent on consumer durables, the consumption of which takes place in periods of time successive to the act of purchase, and hence constitutes a form of saving rather than transitory consumption, it is not systematically related to transitory consumption.This distinction is central to the theory's reconciliation of the conflicting findings. While the time series surveys would capture the long run relationship $C_p=kY_p$, cross section data captures individuals with positive or negative transitory income.

For instance, consider a consumer with permanent income Yp and permanent consumption Cp in two situations. In the first scenario, $Y_m=Y_p$ as $Y_t=0$. In the second scenario, $Y_m=Y_p+Y_t$ as $Y_t>0$. In both situations, measured consumption C_m will equal C_p, as Y_t will be converted to savings, with a subsequent upward revision of permanent income in the second case. A cross-section study would clearly yield a lower MPC in the second scenario.

Whilst the Permanent Income and Life Cycle hypotheses are clearly not dissimilar, to view them as mutually substitutable would be to overlook the theoretical richness evident in a contrast of both. Here, we note four significant differences between the two theories.

Firstly, wealth does not enter as an explanatory variable in Friedman's model, whereas it is clearly subsumed as V_t in the Life-Cycle Hypothesis.Secondly, the Life-Cycle Hypothesis offers a theoretic rationale as to why the proportionality factor b might change over time. Thirdly, consumption patterns are viewed as evolving from a bequest motive in Friedman's model, whereas Modigliani views them as issuing from the attempts of the young to middle-aged to smooth out a lifetime path. Finally, and most importantly, the Life-Cycle Hypothesis stresses the alleged predictability of income over a lifetime, whereas the Permanent Income Hypothesis stresses the role and existence of stochastic variations in income.

At this stage, we may note that both paradigms model the consumer as being dependent on the capital markets for savings and dissavings purposes. Flemming (1978) has showed that where liquidity constraints exist, the long run consumption function, as derived from normal income theories of this kind, need not be linear.

The reader is directed to the original source for further consideration.

A further note on Friedman's model is warranted. Friedman posited that individuals estimate permanent income from past income, via an error learning process using adaptive expectations:

$$Y_p^t = Y_p^{t-1} + \lambda(Y^t - Y_p^{t-1}) \qquad \text{(equation 12)}$$

$$\text{or} \quad Y_p^t = \lambda \left(\sum_i ((1-\lambda)^n (Y^{t-n})\right) \qquad \text{(equation 13)}$$

With the advent of the so-called rational expectations revolution in macroeceonomics, an alternate view to Friedman's might be expected,such was supplied by Hall.

Hall's Surprise Consumption Function

In arguing that wealth estimates, and hence consumption are based on rational expectations, Robert Hall bypassed Friedman's backward looking assessment of permanent income, and the many empirical problems elicited by the measurement of wealth. Hall's argument was that given expectations are rationally formed, and assuming among other things that real interest rates are constant, changes in consumption can be modelled empirically as being determined by news. No past information, such as past changes in consumption or income, affect current changes in consumption.

Mathematically, this may be represented as: $C_t = WC_{t-1} + h_t$, (equation 14)

where h_t denotes "news", the revision in life cycle income between t and t-1. As might be expected, the expectation of h_t in time period t-1 is zero, thus indicating the unpredictability of h. Equation 12 , then, represents the surprise consumption function, according to which consumption should evolve to a random walk with trend.

We note two important implications of Hall's result at this point. Firstly, WC_{t-1} is the best possible forecast of Ct available at t-1, given the information available at t-1. Secondly, any variables dated t-1 or earlier added as regressors to equation 12 should have zero coefficients.

To test his theory, Hall (1978), added additional lagged regressors to the right hand side of equation 12, notably lagged income and second and higher order lagged values of consumption. He then tested the hypotheses that their respective coefficients were zero, using US quarterly data from 1948 to 1977 and found that the F-statistic for the hypothesis that the coefficients on the lagged consumption regressors were zero was 1.7, well below the critical F value of 2.7 at the 95% confidence level. With regard to lagged income, he found a slightly negative coefficient, but this was fully accounted for by sampling variation. His approach seemed justified by the

empirical evidence.

As might be expected, however, theoretical and empirical objections to such a radical view of aggregate consumption have been many; the most articulate being (arguably), Muellbauer, who listed seven theoretical objections to the surprise consumption function, four of which are now listed.

Firstly, Muellbauer pointed to Flemming's critique of Life-Cycle Permanent Income hypotheses; whereby the existence of liquidity constraints led to a question mark being imposed upon such models. Secondly, real interest rates were not constant as Hall had assumed. This implies that the coefficient on C_{t-1} was dependent on real interest rates. Thirdly, Muellbauer questioned whether Hall, in distinguishing between durable and non-durable goods for testing purposes, had been strict enough in his definition of durable goods. Finally, and most importantly, it was noted that Hall's extreme view of rational expectations was unrealistic.

Muellbauer tested for the coefficients of additional lagged regressors, as suggested and previously carried out by Hall. Muellbauer was initially puzzled that the Hall model survived this test for British quarterly data from 1955.4 to 1979.4. He subsequently found a structural break in 1972, when sterling began to float. At that point, the coefficients on the lagged variables changed signs in such a way that the overall coefficients are zero when the two periods are pooled. Consideration of either period in isolation leads to falsification of the model. Interestingly, further tests carried out by Muellbauer failed to establish the cause of this empirical rejection as either being due to the erroneous assumption of real interest rates or the existence of liquidity constraints.

Hall (1989) gives a more qualified restatement of his proposition in the light of a large body of research which forces him to admit that "consumption is fairly close to a random walk, but certain variables have enough predictive power that the hypothesis is rejected in formal statistical tests".

In a substantial review of econometric investigations into the surprise consumption function, he acknowledges the contradiction of his hypothesis yielded by the research of economists such as Muellbauer, Flavin (1981) and Nelson (1987), whist pointing to the support of econometric research carried out by, amongst others, Stock and West (1987) and Miron (1986). One notes the findings conflict to some degree although an impartial consensus might assume an implied rejection of the random walk model.

A consensus might not be so easily yielded after we consider the research into why the random walk model failed in tests. Hall quotes studies such as Runkle (1983) and Zeldes (1985) which suggest, unlike Muellbauer's 1983 study, that liquidity constraints do have explanatory power for the non-conformity of aggregate consumption to the random walk model. He noted that the durability of certain

consumer goods can also explain departures from his model. Models with durable goods by Mankiw (1984) and Bernanke (1985) accept the hypothesis of no explanatory power from lagged income. More importantly, durable consumption appears to compete with liquidity constraints as an explanatory perspective on the predictive power of lagged variables. Models encompassing both features, such as Hayashi's (1985) survey of Japanese households, leave only a small role for liquidity constraints. It would be foolhardy of this author, however, to pre-empt the results of future research by a hasty judgement of this, as yet, somewhat unresolved issue.

CONCLUSION

This essay has treated heavily of the Keynesian innovation that was the "fundamental psychological law", by a comprehensive review of what Keynes actually said, and the relevance of his consumption function to the Keynesian framework. The impetus it provided for empirical investigation has been noted, and it is argued that these findings in turn provided an impetus for subsequent theories.

The Life-Cycle and Permanent Income Hypotheses have also been detailed, together with their alternate reconciliations of the cross-section and time series results. The existence and role of liquidity constraints have been noted as a possible qualification to these models.

Finally, the implications of rational expectations have been noted in an assessment of Hall's random walk model. It is concluded that a reasonable model of consumption is not provided by such an approach, although the precise reasons why are not clearly yielded by consideration of what is a voluminous and often conflicting set of empirical studies.

We may conclude with a comment from Darby in The New Palgrave (1987) to the effect that a "workable consensus" has been reached on the consumption function. Of the remaining issues to be clarified, however, we might especially wish for a better appreciation of the extent to which normal income theories are qualified by the existence of liquidity constraints, and a greater clarification of the reasons for the empirical refutation of the Hall model, as well as, perhaps, greater consistency and agreement across studies as regarding the appropriate methodology for the econometric modelling of consumption.

I would like to acknowledge with thanks the help provided by Majella Lane in preparing this essay

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WHAT DETERMINES MARKET STRUCTURE?

by Lisa Finneran

TRADITIONAL MARKET structure theory remained unchanged for many years. This was a static theory which looked only at the technology of production and at market size. Dissatisfaction with a theory which could only explain 20-25% of industry characteristics led to the formulation of a stochastic theory which claimed that random events over time shaped industry. A more constructive dynamic approach developed in the 1980s with the application of game theory to Industrial Organisation(IO) and, although very helpful, this has meant the fragmentation of the discipline since each industry must be studied separately. To remedy this, in the early 1990s John Sutton has attempted to bring together some general results of IOT findings into a new theory of market structure. In this paper we will examine the development of this theory and in particular look at the predictions of how market structure is likely to change as the market size grows. A general model developed by Dasgupta and Stiglitz (1980) within the context of dynamic game theory also includes the effect of the possibilities for innovation on market structure and vice-versa. This is as opposed to the traditional theory where technology was a given and the Dasgupta and Stiglitz model will be considered to finish. To start - what do we mean by "market structure"?

WHAT IS "MARKET STRUCTURE"?

There are two levels to what is meant by "market structure" - the level of concentration and the level of product differentiation. Simply to count the number of FIRMS in the industry would tell us little about concentration as it would ignore size inequalities between firms. An alternative measure is the Hirschman-Herfindahl index $H = Ss_i^2$ where s_i is the share of firm i, although the more common measure is the concentration ratio which simply states the market share of the top four firms in the case of the US and the top five in the case of the UK. However there are obviously problems involved with this aggregate measure as well.

Defining the level of product differentiation can cause problems due to the difficulties involved in defining the boundaries of the industry being studied. Value judgements may often be necessary in deciding on the level at which substitutability means a good belongs to a different industry. Sutton's model illustrates this point.

How Do We Explain "Market Structure"?

Traditional theory

Traditional theory gives the "warranted level" $\frac{D(p^*)}{x^*}$ as determining the number of firms in an industry. This is simply the number of firms operating at the minimum efficient scale (x^*) which the market can support.

The problem with this, however, is that engineering and accounting studies have failed to establish whether average cost curves are U-shaped or L-shaped. L-shaped curves would mean that the warranted level would only give the upper boundary for the number of firms the industry could support and would not explain the existence of a smaller number of firms, (fig.1).

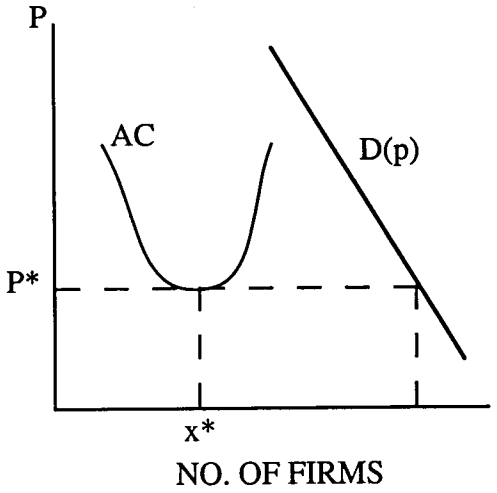

FIGURE 1

Barriers to entry could also mean a lower level of output and a higher price. This could mean higher or lower concentration depending on the rate at which average costs were declining and the magnitude of the price elasticity of demand. Traditional empirical studies of industry structure fail to account for these strategic barriers. Also economies of scope, which are very important in todays world of many multi-product firms are ignored by traditional analysis.

Traditional empirical studies using formulas such as

$$C_j = a0 + a1\frac{(x^*)}{X} + \Sigma a_i \beta_{ij}$$

(where C_j = concentration index, x^* = Minimum efficient scale, X = Total market size, b_{ij} measures the barriers to entry) to regress concentration against firm specific factors only explained 20-25% of accounting returns by industry characteristics.

We should also note that traditional theory predicted that growth in the market would lead to concentration falling, a prediction which has not been verified despite the collection of a substantial body of empirical evidence over the last fifty years.

Stochastic Models

Stochastic models of concentration found that many industries showed a similar skewed distribution of firms with a few large firms, more medium sized firms and a long tail of small firms. The theory then postulated that the size distribution of firms at a given point in time is the product of a series of random growth patterns in the history of the market. Gibrat was the first to describe the process and "Gibrat's Law of Proportionate Effect" stated that growth would possess three characteristics :

(a) there would be a constant rate of growth of the market which would be common to all firms,

(b) but the tendency for firms to grow would be related to their initial size,

(c) and there would also be a random element affecting different firms in different ways

Although we must allow for a random element in economics, I believe many of the events which Gibrat took as random were not really so. They were simply not explained by traditional theory but can be explained by the application of game theory and of strategic behaviour analysis to different industries. Nevertheless, the stochastic models were a move in the right direction (towards dynamism) and probably still have a small role to play in IOT once random elements are correctly defined and filtered. These theories could then operate in combination with the game theory analysis.

The Sutton Model

Traditional theory took the structure (level of concentration) as given and then considered conduct (degree of collusion) and performance (profitability) to be determined by structure in a unidirectional causal chain. The game theory concept of "sub-game perfect equilibria" points out that decisions to enter a market will be based on what will happen once entry has occurred. This analysis usually focuses on one industry and tailor-makes a specific oligopoly model for it. John Sutton

(1991) has tried to bridge the gap between this "ultra-micro" work and the traditional cross-industry analysis. His market structure theory represents one of the relatively few robust theoretical results to have emerged from the game theory literature. Put very simply, the level of concentration depends upon the relative importance of "exogenous" and "endogenous" sunk costs in an industry (exogenous sunk costs are the physical capital requirements while endogenous sunk costs are variables such as advertising and R&D) and on whether goods are homogeneous or heterogeneous.

For homogeneous goods he finds that as the ratio of market size to set-up costs rises, concentration drops as in traditional theory. But also as the "toughness of price competition" in the market increases, concentration levels increase.The extreme case is Bertrand competition where with exogeneous sunk costs the industry is a monopoly. These two effects simultaneously determine the effect of exogenous sunk costs on the number of firms in the industry. This two stage game involves working out what prices will be in the second stage (given the toughness of price competition) for a certain number of firms n. Then using this we find how many firms will enter in equilibrium in the first stage.

e.g. If demand is given by $X =$ where s is a constant and P represents price

$X = 0$ for $P > P^*$, $\frac{S}{P}$

Competition is of the Cournot form,

Marginal costs are constant = c

and firms are symmetric $x =$

then to find prices given n: $\frac{X}{n}$

Max $px - cx$

$$= \frac{dP}{dX}x + P - c$$

But $\frac{dP}{dx} = \frac{-S}{X^2} = \frac{-S}{(nx^2)}$

$$\therefore \frac{-Sx}{(nx)^2} + P - c = 0 \qquad \text{But } S = PX = Pnx$$

$$\therefore \frac{-Pnx^2}{n^2x^2} + P - c = 0$$

$$\therefore P(1 - \frac{1}{n}) - c = 0$$

$$\therefore \quad P = \frac{cn}{(n-1)}$$

Then how many firms will enter in equilibrium in Stage 1?

In equilibrium $\pi = (P-c)\,x = K$ where K is the sunk cost.

where π = profit

We know $$x = \frac{S}{nP} = \frac{S(n-1)}{cn^2}$$

Thus $$\pi = \left(\frac{cn}{(n-1)} - c\right)\frac{S(n-1)}{cn^2} = \frac{S}{n^2}$$

Therefore, in equilibrium, $$\frac{S}{n^2} = K$$

i.e. $$n^* = \sqrt{\frac{S}{K}}$$

However if products are heterogeneous and firms are multi-product producers then such a simple result cannot be derived. Multiple equilibria result and it is not possible to say which equilibrium will occur. Assuming no demand interdependencies or economies of scope, the two polar cases are

(i) each product is produced by a different firm,

(ii) each product is produced by the same firm.

Then if sunk costs rise in case (i), prices must be higher in the second stage to cover the extra costs. This means demand will drop and less products will be produced. This means that the number of firms, n, will drop. However, in case (ii) there will be no effect on n if sunk costs rise. For each of the cases between these two polar cases we cannot say whether a rise in sunk costs will lead to a fall in the equilibrium number of firms.

The existence of endogenous costs makes the results on concentration even more ambiguous. Here, Sutton finds that

(i) increases in market size need not cause a fall in concentration and (ii) the relationship between concentration and market size need not even be monotonic. This is because, for example, in the case of advertising, an industry will need a critical level of output for advertising to be viable so exogenous costs will matter more in this range of output and so as market size rises, concentration will fall. But once this critical level of output is reached, market growth may cause increased expenditure on advertising and this may cause concentration to increase rather than decrease.

In Sutton's model a change in market structure with respect to a change in market size thus depends on whether the industry produces homogeneous or heterogeneous goods and whether exogenous or endogenous costs are relatively more important.Sutton also points out the importance of first-mover advantages, giving the examples of industries which have different structures in different countries due to these advantages.

Dasgupta and Stiglitz (1980)

Finally we look at the Dasgupta-Stiglitz model which shows how opportunities for innovation, demand characteristics and toughness of price competition operate simultaneously to determine market structure, conduct and performance.

The model :

Cournot competition

$P(Q) = SQ^{\varepsilon}$ where ε = the inverse of the elasticity of demand.

$C(x) = Bx^{-\alpha}$ where α= the elasticity of the arrival date of an innovation with respect to x which is a firm's expenditure on R&D.

Marginal costs of production are constant at C(x).

Then profit is given by $Pq - C(x)q - x$

q is the quantity produced by the indivdual firm

1.Firms maximise profit with respect to their quantity q

ie $\frac{dP}{dQ}\frac{dQ}{dq}q + P - C = 0$

2. Firms maximise profit with respect to their expenditure on R&D

ie $\frac{-dC}{dx}q - 1 = 0$

ie $\frac{-dC}{dx} = 1$

3. Because entry is free profits = $(P-C)q - x = 0$.

From 1. $\frac{P-C}{P} = \frac{-dP}{dQ}\frac{q}{P}$ but $P = SQ$ and so $\frac{dP}{dQ} = -\varepsilon S(nq)$

so $\frac{P-C}{P} = \frac{\varepsilon S(nq)^{-\varepsilon-1}q}{s(nq)^{-\varepsilon}}) = \frac{e}{n}$

From 3. $P-C = \frac{x}{q} = \frac{-dC}{dx}x$

and so $P = C - \frac{\delta C}{\delta x}x$

$$\text{and } \frac{P-C}{P} = \frac{\frac{-\delta C}{\delta x}}{C - \frac{\delta C}{\delta x}(x)}$$

But $C = \beta x^{-\alpha}$

so $\frac{\delta C}{\delta x} = -\alpha\beta x^{-\alpha-1}$

and $\frac{\delta C}{\delta x} x = -\beta x^{-\alpha-1} = \alpha C$

thus $\frac{P-C}{p} = \frac{\alpha C}{C + \alpha C} = \frac{\alpha}{\alpha+1}.$

But from 1 $\frac{P-C}{P} = \frac{\varepsilon}{n}$

Thus $\frac{\varepsilon}{n} = \frac{\alpha}{\alpha+1}$

Thus $n = \frac{\varepsilon(1+\alpha)}{\alpha}.$

Thus we have a very neat formula for the number of firms in the industry. This tells us that as a, the elasticity of arrival date of an innovation with respect to expenditure on R&D, rises, then (P-C)/P, the mark-up also rises and the number of firms in the industry falls.

We note that the structure of an industry in this model has nothing to do with the size of the market which fits in with Sutton's view of R&D as an endogenous sunk cost.

Conclusion

We can see that market structure theory has developed a great deal from the traditional approach and it turns out to be a far more complex subject than the original theories indicated it to be. We have been able to analyse the effects of individual characteristics such as the levels of fixed costs, R&D, advertising, the degree of product differentiation, and the magnitude of the price elasticity of demand upon the level of concentration. However these can work in different directions and in any one industry it may be difficult to disentangle their effects. Nevertheless Sutton's work, which is probably one of the most important break throughs in the new IO school, providing it with cohesion in one area at least, which means that far better predictions can be made as regards the future of different industries and that cross-industry analyses are now possible, despite some limitations, within this framework.

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THE SWAP MARKET BUBBLE

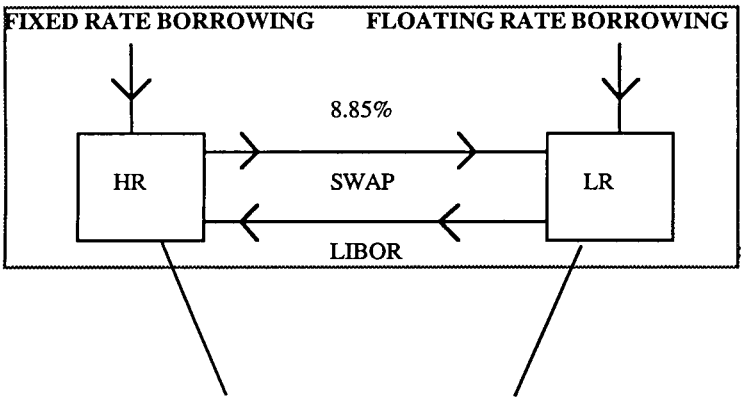
by Tadhg Flood

A financial swap is a derivative security by means of which you exchange one financial liability for another which exhibits different characteristics. Swaps are traded worldwide and are used as a financial tool to hedge and to diversify risk. With about six trillion dollars in contracts outstanding worldwide, the size of the international swap market now exceeds the combined value of all shares on the New York and Tokyo stock exchanges. The swap market has grown to this size over the past twelve years, and this increase has been largely unregulated and unchecked. Regulators are increasingly worried about the world financial system's exposure to swaps, and how a disaster in this area could do what junk bonds, third world debt and collapsed property markets have failed to do. Here, I intend to explain the rationale behind swaps, their main characteristics and advantages and examine the history of their growth. I will then focus on the cause of worry for regulators and how a crash in the swap market could pose severe economic problems.

WHAT IS A "SWAP"?

The swap market has not been created out of a response to a particular market condition. It has been developed to meet a long unsatisfied demand. The basis behind swaps is the concept of comparative advantage. Different companies in different financial markets are treated in different ways. Take for example; a fixed for floating swap, known as a plain "vanilla". A highly rated company and a lowly rated company both raise funds in the fixed and floating rate markets. It is obvious that the highly rated company would receive a more preferable rate in absolute terms in both markets. However the lowly rated firm may hold a comparative advantage in the floating rate market. If both firms raise funds in the market in which they hold a comparative advantage and then swap the interest stream, then cheaper funding rates can be achieved by both parties. The diagram below illustrates the benefits of swaps.

	HIGHLY RATE	LOWLY RATE
FIXED RATE BORROWING	8.6%	9.6%
FLOATING RATE BORROWING	LIBOR	LIBOR+ 50BP



0.25% — Net cost: LIBOR — 9.35%
9.60% — Alternative: LIBOR — 9.60%
0.25% — Savings: — 0.25%

In theory this represents a significant cost saving for both companies, however in practice the situation becomes more complex. The swapping needs of different parties are often not widely known, nor are potential partners in a position to evaluate the credit risk of a counter party. The timing and funding sizes may also differ. These conditions allow room for a swap market maker to appear and to provide a two way market in swaps. The market maker makes his profit on the spread between the bid and ask prices, which is usually dependent on the degree of liquidity and the level of risk involved. The nature of the competition between these market makers is probably the driving force in shaping the swaps market.

The History of the Development of the Market

Swaps started to be traded in the late seventies as firms tried to avoid government restrictions on British firms using dollar financing and non-British firms using sterling financing. In 1981 only $100 million of swaps were traded, as previously mentioned the current figure has grown to approximately $6 trillion. The swap market has no doubt benefited from the recent volatility that seems to have become a permanent characteristic of Capital Markets. A swap allows companies to lock in present profits, to hedge exchange rates, interest rates and many other financial exposures. The use of other substitute derivative products requires servicing margins and rebalancing, the swap requires no such care and has hence become a prominent tool in the management of risk and of finance. The future growth of the swap market will be dependent upon the level of imperfection in international capital markets, after all it is this imperfection which creates the opportunity to achieve a more optimal financial structure(i.e. by means of swaps in the first place).

Another advantage of the swap lies in the fact that, as a privately negotiated instrument, it can be customised to meet the needs of a company.. As the Economist Merton Miller has pointed out; "...you can make almost anything out of anything." The perfect hedge can be created , resulting in a risk free exposure for a company. However as with most financial markets a zero sum game must emerge. Someone must take on the risk and herein lies the inherent weakness of swaps.

THE PROBLEMS WITH SWAPS

Swaps involve two way payments and hence both parties are open to each other's credit risk. The fact that only payments are exchanged and that principals are held by the original fund raiser reduces the risk, but now that the swap market is growing at a frightening pace the interest payments have become a considerable sum in themselves. Allied to this is the fact that a large proportion of swaps involve zero coupon exchanges where one party makes all the payments up front.

This is where the potential for disaster can first be seen. If one company involved in a swap cannot meet interest payments then the other party will cease to do so as well. This collapse of a single two sided swap is in itself no danger to the financial system. However a problem has begun to emerge. The complexity of swap deals is growing exponentially. This means that any amount of principals may be involved in achieving the perfect hedge. A recent swap involved 240 separate transactions. If one party falls through then the whole deal may collapse resulting in a shock wave being sent through the world's capital markets. To understand why this complexity has arisen, one must look at the catalyst for change, the market maker.

Ten years ago only a handful of bids would have been received for a $100 million swap. This illiquidity or market risk was reflected in the spread rates, which resulted with higher profits for the participating market makers. Today a similar trade could receive over a hundred bids and the ensuing yield to the market maker would be small, as is to be expected in any competitive market.

The market maker, however, realises that by differentiating his swap a higher spread can be achieved. This differentiation comes in the form of creating more complex and longer term instruments. While this increase in complexity may achieve higher efficiency in terms of hedging risk, it also introduces a higher level of credit risk. So, rather than reducing risk, new swaps may in fact be introducing new forms of risk in to the market place. This is perfectly rational behaviour for a market maker to engage in, after all, he or she is in business to maximise profits in the same way in which an industrial company strives to. It is up to the end user company to realise that the increased credit risk of a complex swap may not be worth it just in order to achieve the perfect hedge.

Conclusion

Swaps will continue to grow, as long as the opportunity to gain exists within the market place. A financial disaster could occur in theory, as a bubble grows in search of higher profits and better hedges. The danger could be insulated to a certain degree by improving the capital bases of the swap market makers and thus enabling them to shoulder the risk of default. However, the superior solution lies with the end user company in realising that perfection comes at a price.

Notes

LIBOR: London Interbank Ordinary Rate

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MISSION IMPOSSIBLE! : AN ECONOMETRIC INVESTIGATION INTO THE ECONOMIC ROLE OF HEALTH, EDUCATION AND POPULATION GROWTH IN THE THIRD WORLD .

by Gareth Davis

PART ONE

Motivation:

OF ALL THE factors of production, the one which has proven most problematic for the analytical logic of economies has been labour. And paradoxically thinkers from Adam Smith to Keynes to Hayek have overwhelmingly postulated that the ultimate determinant of a society's level of welfare are the skills, aptitudes and capacities of its people.

Economics is a discipline concerned with the optimal allocation of scarce resources. Therefore my study will deal with one area where resources are at their scarcest and where conversely economics faces its severest challenge. My area of analysis shall be the economies of the world's poorer countries. Much of the prestige of economics, and of econometrics, shall rest upon its ability to come to terms with these two issues. Our ability to gain a comprehensive and valid understanding of the forces at work within this situation using a combination of empirical tools and theory and the level of our competence to offer worthwhile policy prescriptions will be extremely critical to the intellectual locus standi of our discipline. This paper shall outline and illustrate many of the difficulties which arise during such an enterprise.

PART TWO

Hypothesis:

My working hypothesis shall be one which is harmonious with contemporary mainstream economic opinion. I shall begin by assuming that a change in the productivity or quality of labour leads, ceteris paribus, to increased levels of production and value creation. I shall postulate further that this productivity depends upon three factors; technical aptitude, physical ability and physiological motivation, each of which can be manipulated in a way conducive to enhanced levels of

output.

The first two of the these three factors are treated of by T.W Schultz (1981). In a succinct summary of conventional opinion he argues that a workforces' technical ability is positively related to the level of education which it has received. Resources diverted to education can thus be seen as a form of investment, which by adding to the stock of human capital will result in higher output levels during subsequent time periods. Schultz then argues a similar case for health. A healthier population will be more productive, reflecting greater physical abilities and longer working lives. Again an addition to this stock of capital will lead to increased production quantities.

The third leg of my tripartite thesis is probably the most complex one: psychological motivation. The nature and scope of the forces acting upon this variable are infinite. Cultural, religious, genetic and historical factors all have roles to play. However, I shall confine my study to an examination of the demographic factors influencing the motivations which drive a society's people.

I shall adopt Simon's paradigm (1977) that population growth is conducive to per capita income growth. There are two main reasons for this. Firstly he argues that larger populations can make efficiency gains from economies of scale. Secondly, and more importantly, populations which are growing are more likely to have a dynamic and energetic enterprise culture. This 'population push' thesis sees pressure from increasing numbers, as acting as a spur to individuals and communities to greater efforts and higher levels of efficiency, so much so that a higher per capita GNP results than would otherwise be the case. This represents my starting hypothesis. Further theoretical speculation shall occur after I have confronted it with data.

Part Three

Data collection:

In my efforts to establish the validity or non-validity of these assumptions I collected information from eighteen selected middle-income lesser developed nations (each nation being defined as such by the "1990 World Bank Development Report"). Middle income nations were selected due to the fact that sufficient reliable data was not forthcoming from low income states. The following criteria were used in the selection of the sample set.

1. Available figures - Jordan, Cameroon, and Thailand could not be included due to lack of information on literacy levels and/or life expectancy.

2. Special cases - South Africa and Lebanon were excluded from my data. It was felt that the impact of civil war during the time period covered by this analysis would be such as to distort social and economic life to such an extent that the

inclusion of these two nations would confuse the picture which this project would give of the forces at work within normal or typical third world countries.

PART FOUR

Variables:

Given that my brief is to test my theory by quantifying the impact on economic welfare of varying levels of health and education and of rates of population growth within developing economies, the following variables were constructed:

A. Dependent Variable (Y) - Average annual percentage change in real GNP per capita from 1965 to 1988. Per capita GNP is widely accepted as the most satisfactory proximate indicator of a society's level of economic welfare. The fact is that its rate of change is averaged out over a twenty-three year interval means that stochastic random fluctuations will be evened out and that these figures are valid indicators of the secular trend in the level of economic welfare prevailing within these societies.

B. Independent Variable (X1) - The percentage of the adult population who were illiterate in the period immediately prior to 1965. Literacy rates were chosen as a proxy for indicating the levels of education present within societies. As such the level of literacy is a purely proximate measurement, the admissibility of which has been subject to vigorous debate (Blaug, 1972). However, I shall adopt it as being the best of the alternative indicators for which quantitative information is available. (School enrollment rates and %GNP devoted to education being even less widely accepted.) To remove the ambiguity about causality which often hinders investigation within the social sciences the figures for this independent variable will come from the time period prior to that covered by the independent variable (Y). In this way causality if it exists and can be distinguished and must flow, within this model, from literacy to national income.

C. Independent Variable (X2) - Average life expectancy at birth for the period immediately prior to 1965. Life expectancy is taken to be an indicator of the standard of health prevailing within a society. Again it has been challenged as such. However I believe it to be the best proxy for which statistical evidence is available and its use by respected international institutions such as UNESCO, UNO and the World Bank illustrate this. Again the question of the nature of the causal relationship has been dealt with by selecting figures from the period immediately prior to 1965.

D. Independent variable (X3) - Population number in 1988 as a percentage of that existing in 1965. This variable is based on the UN mid-year estimates for the years concerned and as such represents an acutely. accurate picture of the change in population which has occured over this period.

Because Y and X3 are from an identical time period the issue of causality can be raised. However I am not concerned primarily with this matter. I wish merely to test Simon's "population push" thesis which sees per capita income growth and population increases as being mutually comparible and mutually conductive against the old Malthusian maxim that they are largely mutually exclusive with population growth leading to fewer natural resources per head until its eventually ground to a halt by famine.

PART FIVE

The preliminary model was constructed in the form

$$Y = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + e$$

If our "a priori" hypothesis is supported by the assembled,

then the estimated parameter β_1 would be negative representing a negative correlation between illiteracy and growth, β_2 and β_3 would be positive reflecting a positive relationship between per capita income growth and the healthiness of a population and between per capita growth and population growth.

Multiple regression of the variable Y on X1, X2 and X3 produced the following results:

$R^2 = 0.47755$

Variable	Paramater Estimator	t-statistic	
		H_0:ß=0	P>(t)
Constant	ß0 2.642036	0.45307	0.65744
X1	ß1 0.031453	1.66636	0.11785
X2	ß2 -0.068766	-1.13098	0.27706
X3	ß3 0.014174	0.82213	0.4247

Filling in the parameter estimates produces a true regression line of the form:

$$Y=2.642036 + 0.31453X1 - 0.068766X2 + 0.014174X3 + e$$

e represents the error term

PART SIX

Analysis:

The analysis shall deal only with the multiple regression given above. The results of the regresion of Y on X1, X2 and X3 individually are given in the appendix. The problem which besets all multiple correlations, that of multicollinearity is formally acknowledged but still shall not form a major part of this discussion.

Initially the R^2 result, which was set at 0.47755 is extremely encouraging for our 3 independent-variable model. Given that an infinite plethora of factors determine growth, the fact that over 47% of the differences between the growth rates of these 18 nations can be explained by variations in the levels of literacy, life expectancy and population growth is remarkable.

However closer examination of the evidence produces a less inspiring picture. Firstly the parameter estimate β_1 is positive and that for $\beta 2$ is negative which roundly contradicts my paradigm by suggesting a negative relationship between growth and literacy and between growth and life expectancy. Only one part of my hypothesis, that concerning a positive relationship between per capita growth and population increase is supported by the evidence from this model.

Secondly and crucially none of the estimated parameters are statistically significant either at the 5% level or even at the 10% level as their t-statistics show. This may be due to the presence of multicollinearity, but in any case the result injures, I believe fatally, any remaining convicting power which this model may possess.

PART SEVEN

Ex-poste rationalisation can be employed in defence of the a priori assumptions that a higher educational and health standards are conductive to improved economic welfare.

To begin with the data used as the raw material for this model poses many problems in terms of its validity as a means of making international comparisons. I have outlined these issues in the notes to the data contained in the appendix.

Secondly it could be argued that 3 nations, Argentina, Chile, and Uruguay have historically had high literacy levels and good life expectancies and that the benefits in these nations from reducing illness and removing illiteracy were reaped in a time period prior to that covered by my Y variable in this model, a variable which dates only from 1965. This variable merely deals with the change in economic welfare since 1965 and does not record its absolute level. As such it ignores the probability that increases in output arising from improved education and health may

have occured before this year. This illustrates the difficulty with using a marginal measurement (i.e. average annual change in per capita GNP) as a dependant variable in a regression whilst simultaneously using total concepts (such as "life expectancy" and "total % of the adult population who are illiterate") as independent variables.

Just as these two propositions cannot be considered refuted, neither can the third one concerning per capita growth and population change, be considered verified. Neo-Malthusians could argue that the data supports an alternative thesis. This one would state that per capita output increases are not generated by a "population-push" but rather by improved technology and larger capital stocks which have allowed per capita income and population numbers to rise. In any case the compact time interval of five years(1960-1965)means changes would have been minimal.In any case this model's lack of statistically significant estimated parameters means that its status as a persuasive tool is almost non existent.

This model however does have policy relevance. It instils humility. It suggests that there is no way of predicting whether or not diverting resources towards improved health, educational and population measures will generate growth. Improved standards in these areas are neither necessary nor sufficient conditions for growth. This viewpoint is consistent with a pluralistic world view which sees the world as a mass of dynamic and highly heterogeneous but interlinked societies. A world in which parameters of fixed nature do not exist. In such a world the usefulness to policy makers of econometric models based on the aggregation of distinctive and unique societies as predictive tools is highly suspect. This model illustrates this fact.

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Appendix

Sources of data

X1: "UNESCO statistical handbooks", 1970 and 1975

X2: "United Nations statistical yearbook", 1970 and 1975

X3: "United Nations statistical yearbook", 1970 and 1990

Y : "World Bank World Development Report" 1990

Rounding of data

X1 and Y were rounded to one place after the decimal point

X2 and X3 were rounded to two places after the decimal point

Collection dates for data

X1: Data displayed was not collected on a similar date for each country.

Apart from Botswana (1946) I feel that the data is concentrated within a very compact time interval of five years(1960-1965) over which changes would have been minimal.

X2: Again no data was forthcoming from a single date from each country. The dates of estimation/collection is displayed in parenthesis beside each observation. Again I feel that, apart from Colombia, all figures are contained within a short time interval of twelve years (1960-1972), during which massive changes are unlikely to have occured. The intrusion of some of these observation periods into the time period for my Y variable may cause problems for my attempt to ensure that X2 remains strictly independent of Y. However I believe that this drawback is insignificant due to the fact that the infringement on the 1965-1988 period is limited in extent and highly concentrated in the early part of this interval, the latest part of this observation being from 1970-1972.

X3 and Y are observed over standardized time periods.

Collection Methods for data

Y: World Bank notes standardized internationally compatible calculation method.

X1: This is based on a compilation of individual national census returns by UNESCO. This raises problems as literacy can be seen as a continum and not as an absolute. Definitions of "literacy" are acknowledged to differ across countries. This will be reflected in census forms with some national procedures being more stringent and leading to higher rates of official illiteracy than would otherwise be the case. Therefore the validity of these figures as reflecting accurate international comparisons is highly questionable.

X2, X3: UNESCO notes standardised internationally compatible observation procedures

IRISH INTEREST RATES;WHO'S TO BLAME?

by Ann Dillon

- "Markets start to wonder how long government can keep from blinking" - Irish Times 29th September 1992

- "Too vocal Ahern falls into currency trap" - Irish Independent 7 January 1993

- "Punt devalued ten per cent at crisis meeting" - Irish Independent 31 January 1993

The currency crisis has captured the attention of the general public for the past few months, with the exception of only a few minor intervals. All of this uncertainty brings confusion and panic. Irish interest rates have reflected this by fluctuating in tandem with these events.

The question must be asked as to why have these events occured. In this essay, I will investigate the standard reasoning as to how interest rates are determined. At the beginning of the currency crisis in mid-August 1992, many banks blamed their increase in interest rates on German interest rates. By running a regression programme based on this information, it will be discovered just how true this claim is. Also examined in this programme,to gauge their influence upon interest rates, shall be the difference in the level of inflation between Ireland and Germany and the variation in the exchange rate with sterling.

FUNCTIONS OF INTEREST RATES

Firstly, a brief introduction to the main basic function of interest rates is necessary. Interest rates are an allocative device.They allocate resources between consumption and saving, and between the various sectors of the economy. They also act as a link between financial markets in different countries.Therefore, the international role of interest rates is to act as a mechanism for distributing funds between the monetary systems of different nations. Countries which require high interest rates tend to be those with high inflation, large balance of payments deficits and weak currencies.

Interest Rates Since 1979

On joining the EMS, exchange rate uncertainty, paradoxically, became an important factor in determining interest rates. The difference between Irish and UK interest rates now reflected expectations about the future of exchange rates . If the Irish pound was expected to appreciate over the period, Irish interest rates would be lower than UK rates (and vice versa). At the time of joining the EMS, some people thought that it merely involved a shift from a fixed link with sterling to an almost identical one with a monetary system dominated by Germany(1). But the certainty of the link between the Irish pound and sterling was not replaced by a similar degree of stability. The Irish pound has been devalued three times whilst it has been in the EMS - 21 March 1983, 4 August 1986, 30 January 1993. (In each case this was provoked by a depreciation of relative ERM currencies.) As a result of all this Irish interest rates did not converge to the level of German ones.

Between 1990 and the present currency crisis, Ireland's exchange rate within the EMS was quite stable. Reductions in interest rates in several EMS countries led to a significant narrowing of interest rates vis-a-vis German rates. This declining trend allowed a lower differential between Irish and German rates to emerge. This could be explained by -"the weakness of the DM against the dollar, domestic economic problems in Germany and, to some extent, sound domestic economic fundamentals in Ireland"(2)

But what are the actual determinants of Irish rate levels? The Central Bank does have a number of instruments available to it, in theory at least, with which it can exercise a degree of control over our money supply and hence over our interest rates. However many would argue that we have little control over our domestic rates and that our fate in this regard lies in the hands of 'external influences'. My study sets out to examine this claim.

Regression

With this in mind, I decided to see how much influence two variables had upon the Irish interest rate. These are the German interest rate (Frankfurt Interbank Offered Rate : FIBOR) and the punt-sterling exchange rate.The estimation of the regression line was done using the Hummer package (with monthly data) and covered a time period dating from January 1990 to November 1992.This meant a total of thirty-five observations.

Under this analysis the Y (dependent) variable is the Irish interest rate. To measure this I have chosen the three-month money market rate. This rate is used mainly because it serves as a direct comparison to the X1 variable, but also because it will not be affected by short term fluctuations or day to day activities. This is neccessary to ensure as accurate a measurement as possible on the variables

affecting Y. This Irish rate seems to be quite volatile ranging from 16.54% (Nov. 1992) to 9.99% (Sept. 1991).

My X1 variable is the German three month FIBOR. The main reason why Germany is generally seen as the dominant country in the EMS is because other countries have more faith in the ability of the Bundesbank to control the German money supply than they have in their own Central Banks (3). This German interest rate has witnessed a steady climb since January 1990 when it was at 8.3%. It peaked in July 1992 at 9.9%. It fell suddenly in August 1992 to 9.55%.

The second independent or explanatory variable chosen, X2, is the punt/ sterling exchange rate. In this analysis, I have decided to deal only with ex poste exchange rates i.e.with real movements rather than with expectations. When the UK decided to exit the ERM in September 1992, it left Ireland in quite an unstable position which caused pressure on the punt within the ERM and hence caused interest rates to increase.

By regressing Y on X1(German interest rate) alone, an R^2 of 0.03764 was yielded showing that only 3% of the variations in Irish interest rates were explained by the variations in the German rate. This is quite a poor result, but it must not be taken in isolation (as with any econometric result). Looking at the parameter estimate of -1.13609 shows that X1 has a negative effect on the Irish interest rate. The t-statistic however indicates that this variable is not statistically significant

Independent Variable	**Parameter Estimate**	**t-statistic H_0 :b=0**
Constant	16.969959	3.36426
X1	-0.629752	-1.13609

The R^2 yielded by regressing Y on X2 (punt/sterling exchange rate) is O.7583, which suggests that 75% of the variations in Y are explained by the variations in X2. The t-statistic is 10.16731, showing a high degree of statistical significance. This is a strong indication of a causal relationship. It strongly suggests that the sterling exchange rate plays a crucial role in the determination of Irish interest rates. The parameter estimate was also a positive one which suggests that a decrease in the strength of sterling against the punt puts upward pressure on our interest rates.

Independent Variable	**Parameter Estimate**	**t-statistic H_0 :b=0**
Constant	-21.812744	-6.70149
X2	35.405027	10.16731

ANALYSIS

Ever since the UK left the ERM, Ireland has suffered as regards high interest rates, uncertainty and threats of devaluation. This regression shows in a dramatic way the importance of British influences in shaping our economy. For example the "weakness" of sterling has had many consequences for Ireland including high interest rates(which has had an adverse effect on economic growth) and a reduction in the competitiveness of Irish exporters to the UK. Business confidence has also been hit. However other forces may have been at work to contribute to this pressure on our currency and hence our interest rates(see list of events in fig. 1). For instance, speculators may also play a key role here,(some believe that it is all due to George Soros that we are having these problems)(4).Others would point to a more autonomous role for indigeneous forces such as the policies followed by our Central Bank.

At this point, it might also be worthwhile to compare Ireland's interest rates those of other similar countries. Switzerland's money market rate (three month) has not been very volatile, fluctuating around 7.4% to 8.79% over the same period. But it has seen a decline in the last few months to about 6.88%. Although the Swiss economy is not identical to Ireland's, it is neither a member of the E.C. nor of the ERM, there are grounds for comparasion. It is also a small open economy and yet it is not wholly tied to Germany. Portugal is perhaps an even closer proxy and its money market rates have been almost consistently higher than Irish interest rates for the past few years with a sharp increase in the last few months (similar to Ireland). This shows that being a member of the EC does not necessarily imply economic convergence. Recent events have made this subject quite topical. At the moment, it is very hard to say what the future will hold for Ireland's interest rates. Hopefully, this essay has given the reader a little insight into the determination of Irish interest rates. But in no way is this project complete or absolute. Further investigation is required.

NOTES

1. McCarthy, (1979) in John D.Fitzgerald "The National Debt and Economic Policy in the Medium Term" ESRI Report 1986 p.4

2. Central Bank, (1991)Annual Report (Summer)

3. Leddin and Walsh "The Macroeconomy of Ireland" Chap 10

4. Stephen Dodd Irish Independent 2 December 1992 p.8 "The Money Predators "

LISTS OF EVENTS

2 Sept US dollar continues to weaken.

3 Sept UK Chancellor, Norman Lamont boosts sterling by borrowing £7.25b

5 Sept US dollar weakens further due to: - unexpectedly weak employment figures

- cutting of key Us interest rate

8 Sept European Finance Ministers meet in Bath

9 Sept Finland lets its Markka float

15 Sept Bundesbank cuts interest rates by a quarter point (to 9.5%)

16 Sept Pressure on sterlin to devalue

17 Sept Sterling is devalued and allowed to float

18 " Dublin money market rates shoot up.

19 " Punt "stands firm". But it is revealed that a third of the Central Bank's reserves have been spent (£1000m approx.) on defending the punt.

20 " France votes "yes" to Maastricht

23 " UK interest rates cut by 1%

26 " Threat of 2% interest rate rise by the banks - suggestion made of a two-speed Europe

29 " Irish interest rates increase by 3%

30 " Bundesbank says it won't reduce interest rates again this year

6 Feb Ireland devalues by 10%

THE EFFICIENT MARKETS HYPOTHESIS: MYTH OR REALITY?

by George Floyd

INTRODUCTION

Market efficiency is the cornerstone around which so much investment theory relies upon for its validity. If stock markets are perfectly efficient, then both technical and fundamental analyses are a waste of effort. The market cannot be beaten. The only sensible strategy to adopt is a buy-and-hold one.

Efficiency, however, is not a black and white issue. Different levels of efficiency can be tested. Empirical evidence must be the key criteria by which market related theories are judged.

There exists a wide level of agreement that markets are not efficient in the strong form. Finnerty(1976) showed that investors who had access to inside information were able to earn supernormal profits. This finding concurs with most of the other research in this area. A large degree of consensus exists - at least in academic circles - that the market is efficient in the weak form. The random walk explanation of share price movements has enough empirical evidence supporting it to convince all but the most diehard believers in technical analysis.

THE DEBATE OVER EFFICIENCY

The main area of contention as regards efficiency relates to whether the market is semi-strong efficient. The semi-strong form implies that a stock is always priced at its "intrinsic" value. The price reflects perfectly at all times all publicly available information. Prices are supposed to react instantaneously to any new information received so that it is impossible for investors to make profits by spotting a "wrongly priced" share and investing in it.

There are, however, different degrees of efficiency within the semi-strong level, as outlined by Keane(1983). Perfect efficiency at semi-strong level pertains when prices are so close to their semi-strong worth that not even the most expert information processor has the ability to earn an excess return for his efforts. Near efficiency pertains when prices are sufficiently close to their semi-strong worth so as to make it futile for all investors, except for the expert minority, to pursue an active trading policy as opposed to adopting the passive buy-and-hold approach. It is also

a necessary condition at this level that the expert earns only sufficient returns to cover his transaction costs and reward him for his time and effort expended. Inefficiency at the semi-strong level is described as occurring when there is a possibility for even the non-expert (the ordinary investor) being able to perceive mispriced securities, or at least, if the non-expert is able to profit from the recommendations of the expert who observes them. Ability to profit from tipsters advice is a case in point.

So if the market is efficient at the semi-strong level, what then would be the point of engaging in fundamental analysis? Perhaps if such activities were abandoned market efficiency would collapse and cease to exist anymore. This hypothesis will be examined in more detail below. What is clear, however, is that the need by information processors to have an incentive to carry out their work places the burden of proof for the existence of efficient market theory back in the camp of its advocates.

Evidence Supporting the EMH

As noted above, empirical evidence is the key to proving or disproving the theory of market efficiency. It was only with the emergence of computers and improved statistical methods that such empirical study became possible. Fama (1970) was a pioneer of such studies and his findings have served as the building blocks for later research. Therefore it is logical to begin by outlining the results of Fama's research.

It is important to remember that each individual test was concerned with the adjustment of security prices to just one kind of information-generating event. However, taken together, the results have provided consistent support for the concept of semi-strong efficiency.

Firstly, stock splits [1] were considered by FFJR [Fama, Fisher, Jensen, Roll] (1969). They assumed that splits were often associated with the appearance of more fundamentally important information, such as earnings announcements, so caution had to be taken with the interpretation of the results. Nevertheless, a split was a sign of management confidence about future earnings and was a signal of future dividend increases. FFJR were interested in measuring any "unusual" behaviour around the time of the split. FFJR's findings supported the concept of market efficiency, at least with respect to the ability of the market to absorb the information implicit in the split.

Ball and Brown (1968) studied public announcements by companies over the period 1946-66. They concluded that no more than 10-15% of the annual earnings announcement had not been anticipated by the month of the announcement. Waud (1970), in a survey, concluded that on a macro level, if anything, the market anticipates public announcements. Most information is incorporated into the share price by the time earnings are announced, indicating that the market is a good

forecaster of earnings, or at least makes effective use of other sources of information. Presumably the market must progressively revise its estimates of a company's prospects in response to the multiple sources of information throughout the 12 months between earnings announcements.

Studies by Firth in the UK, Johnson in Canada, FFJR in the USA have all shown that no profitable trading results could be achieved upon the announcement of a capitalisation issue and that the market adjusted share prices instantaneously and accurately to new information. Pettit and Watts found that all price adjustment was over immediately after the announcement and that the market had acted efficiently in evaluating the information.

The announcement of the build up of large investment holdings in a firm has been studied. It has been shown that share prices rose significantly prior to the announcement. This may be put down to leakage of information and/or strong pre-announcement buying by the investors building up their stakes. Upon announcement a large rise occurred in the price of the share. After ten days the residuals settled down to their normal relationship to the market index. The behaviour of prices after the announcement itself was made is fairly rational and "efficient" in the semi-strong sense although the pre-announcement movements may be more problematic to explain in terms of efficiency.

The effects of earnings announcements by similar type companies was examined by Firth who found that the reaction to such information was in the direction expected, although it was impossible to say whether the magnitude was correct. The findings showed again that the market used the relevant information to establish share prices - this in turn supports the efficient markets hypothesis.

Rational for the Continued Existence of Analysis

In spite of the evidence, why does the small investor so frequently lead himself or herself to believe that the market is inefficient and that the possibility of earning excess returns exists? Several possible explanations have been cited. One such explanation is the "information gap" thesis. According to this theory an individual has gaps in his own information set. Accordingly from his subjective viewpoint the price of the share in question appears to be incorrect.

Biased reporting is also cited as an explanation. In this analysis, successful recommendations and investment selections are more widely reported by portfolio managers and by the financial press than are failed strategies. Similarly, the psychological effects of knowing someone who has apparently beaten the market will attract others to believe that they too can emulate such achievements. The validity of these stories of out-performance are usually not subjected to any objective testing. Furthermore, in hindsight many investors are able to reflect upon opportunities which, had they picked the right shares at the right time had the potential to make them very rich. The potential for making huge profits in this

manner has been highlighted in research by Niederhoffer and Regan(1972). The problem is that it proves impossible to identify these shares in advance as the information needed to pick these "under-valued" companies has not yet become available to investors.

Investors often fall prey to confusion about what constitutes excess returns. This is illustrated by the fact that the performance of high Beta shares [2] has often been confused with out-performing the market during bullish periods of the market cycle. However, in bearish periods the converse is true, with conservative portfolios of low risk shares performing best in the market, whilst over the longer term high Beta portfolios perform in accordance with the implications of the efficient markets hypothesis. So called, 'outperformance' of the market by high Beta shares can be explained away as being the necessary extra reward for the additional risk taken on by investors.

Alternative Techniques Proposed to Beat the Market

Evaluating attempts to find a formula to beat the market are a good means of assessing the strength of market efficiency. The price:earnings (P/E) ratio has been used as such a tool. It has been asserted that portfolios composed of low P/E shares persistently out-perform other portfolios, even after adjustment for differential risk levels. However the validity of these claims seems to be undermined when the small firm bias of the survey is eliminated and when the tax effect on stock returns was adjusted for. However once the small firm bias of the survey is removed and the tax effect on different categories of dividend is adjusted for these claims are undermined(as fiscal factors may be a key variable influencing a firm's dividend policies).

Inflation accounting as a predictive tool has been suggested by Thomson(1981) He argued that the impact of current cost information would differentiate companies in times of high inflation. But, the inability of an investor to accurately predict future inflation levels suggests that the theory has very limited use. Only if someone could consistently produce a better estimate of inflation than everyone else could the market be deemed inefficient.

Some of the pro-efficiency surveys themselves have come in for criticism however. Schwart has criticised Fama's results on the grounds that no mention was made of the dispersal of information. Relatively early receipt of information would give the receipient trader a transitory monopoly on the information received and would allow him to act before the rest of the market had access to the information. If this were to occur on a regular basis it would suggest that some traders have superior access to information (which would give them a market advantage). Presumably this could not be reconciled with the concept of semi-strong efficiency as expounded by Fama.

These arguments notwithstanding, the main bulk of the evidence seems to suggest that semi-strong form efficiency holds. Jensen (1968) monitored the performance of 115 mutual funds during the period 1945-64. He found that on average the funds were unable to out-perform the passive buy-and-hold strategy. One writer, rather ironically, has gone as far as to suggest that the market must be inefficient on the grounds that if the market were efficient, then portfolio managers should, on average, perform no worse than the market average.

It would seem that the best option for institutions would be to attempt to duplicate the market portfolio. They have the size and resources to purchase the necessary breadth of stocks at relatively low transactions costs and would no longer need to revise as frequently the portfolio as the relative risk of shares change in response to the release of new information. Research costs would be virtually zero - a major advantage over conventional funds. Some funds are actually now doing this. For example, the American National Bank's Index Fund estimate that their trading costs are less than 0.02% as compared to 1.5 to 3% for the conventional portfolio.

All of the above does not of course prove that the market is efficient. The problems of researching the market are such that it is near impossible to relate the price movements of individual securities with specific events or information data. Primarily it is the consistency of the evidence rather than its sheer volume of which has done so much to establish the credibility of semi-strong market efficiency.

LESSONS FROM HISTORY: 1987 AND 1929

Events such as the Stock Market Crash of 1987, however, have done much to undermine the faith of many investors in market efficiency. But the crash should not necessarily be taken as watertight evidence of irrationality in the valuation of shares. It is far from inconceivable that the specific changes in the "fundamentals" might produce a fall of 20% in the value of shares, although if you take the view of shares value being a short-term stream of income flows it would need to be associated with some major catastrophe or a declaration of war. However, you may regard shares value as being best characterised by cash flows projected far into the distant and highly uncertain future, which is then discounted back with the appropriate adjustment for risk. Because the relevant valuation formulas are so highly non-linear, even a small revision in the risk adjusted discount rates or estimated growth rates for future cash flows can sometimes produce large changes in what seemed to be the warranted values for shares.

Miller (1991) suggests that the signs which made investors fearful in 1987 were of enough importance to trigger these fairly massive re-evaluations. He lists the combination of the weakness of the Reagan administration in dealing with the budget deficit, important new tax penalties being proposed on corporate takeovers, shooting incidents in the Persian Gulf (with the possibility of long-term higher

energy prices) and the probability that Western nations may have been drawn into that conflict as being the key factors. Due to the combined effect of these factors, none of which would have been sufficient on their own to have caused consternation, it is very conceivable that investors would seek to reappraise their views about the prospects of long-term growth in the economy and the future of their dividend streams.

In similar fashion, the Crash of 1929 has been paraded as an example of how the market was inefficient. But the evidence on which this analysis is based becomes more and more tenuous as time goes by. The main cause of the 1930s depression was the unwillingness of the Federal Reserve to respond to the massive increase in the demand by the public for real balances, as well as the collapse of the US banking system. Very little of this was related to credits given to individuals or brokerage houses. The largest falls in stock prices did not occur until 1932 in any case and these were due to the mishandling of the economy by the Federal Reserve.

Still the view persists that the market is a ticking time bomb waiting to explode if not kept bound up in regulations. The failure of efficient market proponents to get the message across, in both instances,that the market was merely responding efficiently to information as it became available, has perhaps been one of their greatest failings.

Conclusion.

Having seen that all the evidence points in favour of market efficiency at the semi-strong level there exists a paradox. Would efficiency cease to be true for the market if everyone believed in efficiency and ceased their quest for mis-priced securities? The point is, however, that the market does not have to be perfectly efficient. Near efficiency is enough to ensure that the vast majority of investors adopt a passive strategy. The paradox may be better stated as being that the market is incapable of being perfectly efficient unless some experts disbelieve it to be so. Every revolution gives rise to counter-revolutions. The efficient markets revolution is no exception. Methods of research are constantly improving and it is possible that someday the EMH may be superseded. However as things stand at the moment it appears that the semi-strong EMH best characterises the nature of the present stock market.

Notes

1. Stock Split - a device by which company's increase the number of shares in issue by subdividing the stock already outstanding.

2. Beta - a measure of how the return of a security is correlated with the turn of the market. High Beta shares move proportionately more than the market does.

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IT'S A MATHS MATHS WORLD!

by Alan White

MATHEMATICAL ECONOMICS embodies various applications of mathematical techniques to economics, particularly economic theory. This branch of economics dates from the nineteenth century and has developed a rate of natural increase in recent decades. Mathematical economics is not so much a subject as an area of study within economics closely affiliated with economic theory. Its scope is changing constantly, since it acts as a port of entry for new analytical techniques imported from mathematics on their way into the main body of economic analysis. Many economists have discovered that the language and tools of mathematics are useful. Simultaneously many mathematicians have found that mathematical economic theory provides an important and interesting area for applying mathematical skills and that economics has given rise to some important new mathematical skills such as game theory.

This paper is divided into four sections. Section one traces in brief the history of mathematical economics. Given that the role of mathematics in economics has grown in importance, it is constructive to evaluate professional attitudes to this growth. Section two contains a synthesis of two such surveys. Section three will rationalise the current role of mathematics in economics, while section four shall draw some conclusions.

HISTORY

The history of mathematical economics consists of three broad and somewhat overlapping periods. The first (1837-1947) has been referred to as the calculus-based marginalist period. The early period of mathematical economics was one in which economics borrowed methodologies from the physical sciences and related mathematics to develop a formal theory based largely on calculus. Employment of total and partial derivatives and of the Lagrange multiplier was widespread. During this period the mathematical foundations of the modern theories of consumer and producer surplus, oligopoly and general equilibrium were developed. Names associated with this period include Cournot, Hicks, Walras and Pareto.

Although the calculus approach was never abandoned, the 1950s witnessed the advent of a new approach namely that of set theory and linear models in economic analysis. Using set theory meant greater generality in that the classical assumption of smooth (continuous) functions could be replaced by more general functions. Using linear models facilitated treatment of phenomena that could not be

represented by smooth functions. Arrow, Debreu and McKenzie used set theory, topology and convexity to study the existence of equilibrium, culminating in Debreu's "The Theory of Value" in 1959. Input-output models which are linear models of inter-industry relations had been developed by Leontief and linear programming stemmed from the early works of Dantzig.

The current period of investigation which dates from the 1960s has essentially been one of integration, in which modern mathematical economics combines calculus, set theory and linear models. Research has been conducted on the economics of uncertainty, optimal growth and taxation. Gerard Debreu and Stephen Smale have investigated the properties of equilibrium while Scarf has studied the computational procedures for calculating equilibrium prices. This list is not exhaustive and is intended to whet the appetite and give an indication of the growing dominance of mathematics in economics. However, many have found this advent somewhat difficult to digest. This issue is addressed in section two.

Attitudes to Maths

Two independent (though very similar) surveys on attitudes to maths were conducted by Gruebel and Boland in the U.S. in 1986 and by Greenaway in the U.K. in 1989. The intention was to evaluate the professional attitudes of academics to the growth of the use of mathematics in economics. It can be taken as axiomatic that the use of mathematics in economics has increased both as a tool of scientific investigation and for training. Evidence of this growth is cited in the U.S. survey. Gruebel and Boland looked at economics journals - the principal outlet of academic economists and noted that in 1951 2.2% of the pages of the American Economic Review contained at least one equation while this percentage had risen to a significant 44% by 1978. Such a measure represents only one indicator of the rise of mathematics but is nonetheless indicative of its importance alluded to in section one.

Greenaway adopted much the same format as Gruebel and Boland in order to facilitate useful comparisons between the U.S. and U.K. results. Both surveys asked academics if they considered the amount of resources devoted to mathematical training at the undergraduate level to be adequate. In the U.K. the response was favourable (66%) though this percentage was lower in the U.S. Typically U.K. undergraduate courses in economics are more specialised but at the post-graduate level there is a less formal training element than in the U.S. Interestingly 60% of respondents in the British survey felt that too much journal space was devoted to mathematical articles (that is, articles whose arguments were predominantly mathematical) with a comparable figure for the American survey.

If economists feel that the composition of economics is, in some sense wrong then why does such a state of affairs exist? This point shall be dealt with later. 45%(U.K) and 31%(U.S.) of respondants felt that the mathematical and modelling

skills of research economists have improved the reputation and prestige of the economics profession since the 1950s with a significant proportion uncertain (21% and 50% for the U.K. and U.S. respectively). A significant proportion felt that the development of mathematical skills did not prepare young economists for careers in industry or government. This is rather alarming when one remembers that over half of the respondants were pleased with the level of resources devoted to undergraduate training in mathematics. A resolution of such an anomaly may lie in the fact that the respondants of the survey had academic careers in mind when evaluating the role of mathematics.

In addition, British economists felt that possession of mathematical modelling skills were not a reliable screening device for high quality academics and yet felt that such individuals have less trouble in securing employment at universities. On a practical level academics may be judged on the basis of mathematical merit because it is a more accessible screening device, given its importance in current economic thought. Indeed a majority would feel that the acquisition of mathematical techniques leads to a higher rate of publication and that such economists have greater evidence of their productivity to offer potential employers.

Despite the importance of the technique of mathematical applications to the discipline of economic, little had been known about professional attitudes towards its growing importance. Greenaway, in particular did not set out to support a specific hypothesis but rather to uncover little known attitudes. The implications of the surveys are stark. U.K. and U.S. economists are happy with the resources devoted to teaching mathematics but feel that too much journal space is devoted to mathematical articles, that mathematical specialists can publish more easily and can obtain jobs in the profession with greater ease. All of this implies a perception that mathematical competence and ability is used as a screening device for entry into the profession.

Role of Mathematics in Economics

It is perhaps no small wonder that mathematical competence is a necessary condition for entry into the profession. After all, some of the best economists have been mathematicians. Marshall, Keynes and Fisher, to name a few, made their contributions to economics in fields outside of what would be regarded today as mathematical economics. Their respective contributions did not embody the formal introduction of mathematics per se, but rather they extended the frontiers of conventional economics by familiarising economists with simple mathematical techniques and notation. We must immediately beg the question; why is its role in economics more or less tacitly accepted despite the apparent discontent expressed in the two surveys ?

Mathematics is a rigorous and well-defined study of the structures, configurations, and interrelationships that characterise the world in which we live. It

functions as an exacting language that articulates the essential characteristics of a wide range of situations so that the key aspects of those situations can be dispassionately examined. Modern mathematics is economical in the very best sense of the word, in that:

- It clearly states the bare-bone assumptions that underpin a relationship.
- It highlights the logical processes the characterise the relationship.
- It states any conclusions that are implied by the relationship in a clear and concise form.

Mathematics has proven most successful in making significant contributions of a non-mathematical variety. It is especially suited to abstract thought. An economist may extract from the economy relationships considered of most importance and the extent of the progress is then determined by the facility with which he can make deductions from the logical structure of his abstract theory and transform these into statements about the real world. Indeed mathematics removes the inherent ambiguities and value-loaded connotations associated with strictly verbal treatment. Furthermore when confined to a strictly verbal analysis, arguments become tangled in an intricate web of grammar, particularly when considering complex models involving several interrelationships. Professor Stephen Smale, recognising this difficulty remarks "....to write a paper with no technical mathematics is a real (but very constructive) confrontation with the problem of communication". It is this parsimonious and precise feature which has aided decision makers and policy makers in general.

While the success of mathematics in economics is less impressive than that in the natural sciences, its contribution cannot be overlooked. The introduction of prices and money necessitated the introduction of elementary mathematics while consideration of equilibrium supply equals demand conditions brought with it its reticent equation while analysis of multiple markets extends the range of consideration to solutions of systems of equations. In this regard, the use of difficult ideas of algebraic topology, such as Brouwer's Fixed Point Theorem have led many to believe that mathematics can obscure the economic phenomena underlying the existence of equilibrium. Indeed it may be felt that economics becomes too mathematically-loaded and that the mathematics-averse individual may (understandably) be repuled by such presentations. Nonetheless, economics by its very nature can attain a level of abstractness and obscurity independent of any mathematical orientation. Mathematics is employed as a means to an end , not an end in itself (at least as far as economics is concerned). Assuming that the economist is rational, (assuming economists are allowed to make assumptions) successful utilisation of mathematics will entail an agglomeration of the essential features of mathematics and the disposal of those aspects of peripheral interest to the economist. This will imply an economy on the use of mathematical skills and techniques in order to attain an optimal level of usage.

Conclusion

In light of the growing contribution that mathematics is making to economics, many economists have stopped to evaluate this rise to dominance. Has its use grown too much? It has been argued that its employment in economics has been advantageous in progressing the advancement of economics; such is its importance that it constitutes a barrier to entry into the economics profession. The person who ignores the contribution of mathematics to the study of economics not only bucks a strong trend in these areas, but also cannot take advantage of tools and a mode of analysis that have greatly enhanced the power and ability of decision-makers in those areas. Equations no longer raise eyebrows; non-mathematicians no longer call themselves economists.

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THE MARKET ECONOMY, FREEDOM AND DEMOCRACY

by Garrett O'Boyle

"...the masters of the Government of the United States are the combined capitalists and manufacturers of the United States."

— President Woodrow Wilson, 1914.

To some, the operation of 'consumers' sovereignty' in the free market is a fundamental aspect of democratic control, allowing production and distribution decisions to be decentralised to an individual level, allowing real economic freedom which reflects and facilitates political freedom. Others, however, prefer a more substantial form of 'economic democracy' wherein real egalitarian control of a society's resources is effective.

DEFINING DEMOCRACY

To some theorists such as Green, western society is but a pseudo-democracy which boils down to being a mere prop for social status. To this end he formulates political equality as being "the real spirit of democracy" — the idea that an individual counts for one, and no more than one, in societal decision-making (Creen, 1985;5). Political equality must surely be one of the most important factors in measuring 'democraticness', so we will use it as the central element in our definition of democracy. I will argue that economic privilege distorts political equality both directly and indirectly (through social structure) even within this relatively broad definition.

However, MacPherson (1973) has persuasively argued that an adequate definition of democracy must include not only that each individual has equal effective say in decision-making, but that each individual should have equal opportunity and access to the means enabling them to develop and fulfil their 'human potentialities'. In this more precise philosophical definition of democracy, it is argued that the market relations fundamental to capitalist society negate political freedom.

The Market and Equality

Dogmatic advocates of the market would argue that there is no logical necessity for exchange relations to result in economic inequality. Basing their arguments on general equilibrium theory, they demonstrate that with any given initial endowment of resources in a 2 person, 2 commodity, 2 input economy, a mutually beneficial and agreeable sequence of exchange will occur, with both participants ultimately maximising their utility. However, the real world is very far removed from this model, which assumes a state of perfect competition (whereby each individual producer or consumer is a price taker). The model also explicitly states that the initial distribution of resources will determine the subsequent post-exchange distribution, and an egalitarian outcome is only possible in the event of an initially egalitarian distribution. Thus in a society where wealth is transmitted through the generations and in a society which developed from oppressive feudal relations this argument has little relevance. The model is further damned by the patent inapplicability of perfect competition in a modern multinational corporate society. Thus the operation of the free market cannot guarantee that self-perpetuating economic inequalities will not be produced.

These inequalities may be said to have a subversive influence on the degree of political equality in a society, in purely procedural terms. The impact can either be direct or indirect. Direct influences include the obvious advantages that wealthy individuals and powerful corporate interests have in "persuading" decision-makers. Lobbying, financial contributions, campaign support and outright bribery are such "advantages". Howard Sherman (1972) sees economic inequality and its political effects in terms of class antagonism, and identifies two contrasting views of capitalist democracy. These are labelled the "pluralist" and "radical" positions (1972;123). The former view sees democracy (in the U.S.) as reflecting plurally distributed political resources, with decisions being a result of the interaction of different interest groups' competing claims. The political system is more or less democratic and political power is to a large degree independent of economic power (ibid). The radical view predictably sees economic inequality as having a much greater impact in frustrating political equality.

But economic and social inequality may have a less direct impact on the operation of democracy, in that patterns of political participation vary with class background. Subordinate economic class members, as individuals, have less access to information, less education and are more politically alienated than those in the dominant class. Educational and cultural impoverishment means that the necessary basis for political participation is denied. An individual's sense of citizenship and political effectiveness will be affected by this. Thus, those who maximise their formal political rights tend to be of an economically ascendant class, therefore the state, controlled by this ruling elite, may then give institutional backing to the existing distribution of advantages and recruitment into power positions: "the state could be defined as an institutional complex which is the political embodiment of the values and interests of the dominant class" (Parkin, 1972;27).

The dominant class can then use its economic and political power for social self-recruitment resulting in perpetuation of their dominance (Parkin,1972;14). (Through for instance the state controlled education system, which has an important role in socialising individuals into their class roles and expectations). Likewise the concentration of control of the mass media in the hands of the privileged compounds this — the quality and quantity of news published depends on the class at which it is aimed, and this will also have an effect on political attitudes.

We have seen the argument propounded by advocates of the free market that there is no logical necessity for the operation of the market to either result in economic inequality or to distort political equality. Moving onto a more philosophical level, theorists such as Friedman would argue that a competitive capitalist economy not only does not hinder the operation of democracy, but is necessary for that operation.

Capitalism and Freedom

Friedman sees concentration of power as a threat to freedom, and thus the decentralisation of economic decision-making through the market is conducive to democracy. Were the economic power in the hands of the state, there would be no capacity for the private sector to be a check on the public sector (Friedman,1962). Voluntary co-operation can be established in a system of exchange - each individual working for his or her self-interest benefits society as a whole. Friedman believes that such market decentralisation effectively separates economic power from political power (1962;9). Based on empirical evidence, not too many people would agree with this postulate. He also links the contemporaneous development of classical capitalism and political democracy without proving causality.

However MacPherson (1973;148) suggests that capitalism could only be established when "political freedom had been won by those who wanted capitalism to have a free run"; thus the level of actual freedom will be largely determined by the interests of those who desire capitalism to be sustained. He further makes the point that the liberal state which facilitated the establishment of capitalism wasn't really democratic, and that once the franchise was extended the government began to curb market freedom (ibid). Friedman then goes on to extrapolate from a sample Robinson Crusoe model of exchange - in which (theoretically) voluntary co-operation in the market maximises freedom in the co-ordination of economic activities, which is the fundamental issue in society —to a full, industrial, monetary economy without mention of the shortcomings of general equilibrium theory (1962;13).

Friedman claims that political freedom can be defined as the absence of coercion of a person by others - the power to coerce is a fundamental threat to freedom (1962;15). He further claims that so long as effective freedom of exchange is maintained, a consumer or employee is prevented from being coerced by sellers

or employers by the presence of others which he can deal with. MacPherson (1973;146) takes issue with Friedman's claim that every transaction is strictly voluntary if individuals are effectively free to enter, or not to enter, into any particular exchange. The question should really be about an individual's freedom not to enter into any exchange at all. MacPherson claims Friedman has overlooked the consequences of the separation of the ownership of capital from the mass of the labour force, rendering the latter without a real choice whether to sell its labour or not - "where there is no choice there is coercion" (Ibid). Thus coercion is inherent in capitalist market relations, an idea somewhat damaging to Friedman's claims.

The Market, Capitalism and the Nature of Man

MacPherson goes still further. He identifies two claims made by liberal-democratic theory, and sees them to be antagonistic (1973;3). They are based on two distinct concepts of man - the first claim is that liberal-democracy maximises individual utilities: This is based on a view of Man's essential self as an infinite consumer and appropriator; the second claim is to maximise individual human powers, and this is based on a distinct view of man as an "enjoyer of his human attributes", as "a bundle of conscious energies seeking to be exerted" rather than a "bundle of appetites seeking satisfaction" (1973;5). MacPherson claims the latter concept to have been incorporated into liberal theory to make it "liberal democratic", and thus democracy for him should include equal rights, opportunities, and access to the means of fulfilling distinctive human potentialities.

Furthermore, he sees the concept of Man as an infinite consumer as both a social construct and the basis for social constructions (pp 17,18). Society felt the need to set up a right to almost unlimited property acquisition as an incentive to production when those most active (ruling) sections of the people judged that the chief purpose in life was the battle against (perceived) scarcity. The result was a new moral acceptability of unlimited desire, and the assumption of the rationality of acquisitiveness. An incentive to production was necessary to make real the potential that was there for wealth and power - hence it was necessary to reformulate the legitimating theory underlying social institutions. This was done by postulating infinite desirousness and its rationality (p 19).

MacPherson no longer sees the need for this consumerist concept of Man in democratic theory and argues that it, and the market relations inherent in the capitalist society resulting from it, are antithetical to the concept of real democracy involving an "equal effective right to live as fully humanly as he may wish". The latter right involves not only the human capability to realise some goal, but also the actual ability to achieve it - this necessitates access to external resources and makes any limitation of that access a diminution of individual powers (p9). The separation of capital (the means of labour) and the source of those external resources from the mass of the labour force results in a continuous net transfer of some individuals' powers to others (the owners of capital) by means of labour market transactions.

Such a transfer of powers is fundamental to the capitalist system, thus the capitalist system of the free market diminishes rather than maximises equal individual freedom to use and develop natural capacities and human potentialities (pp 10-11).

CONCLUSION

Thus, if you accept the arguments tendered, a free market economy is detrimental to democracy in a number of ways. First, the resultant economic inequality gives differential levels of access to and influence over decision-makers, differential access to information and influence on public opinion, and class relations which breed political apathy, resignation and class reproduction. On a deeper level, the fact of labour market transactions in a capitalist society stunts the fulfillment of human powers.

Questions should be asked, however, as to whether it is the operation of the market per se or just its operation within capitalist society which is the problem. For example, in a model of market socialism, with popular ownership of the means of production, would participation in the labour market result in the alienation of individual powers ? If so, to whom, given that people would (in a "true" economic democracy) own the state, the capital resources, and be "their own" employers? Whatever about that, the more direct procedural aspects of the subversion of democracy would certainly be lessened under almost any (non-totalitarian) social system other than capitalism.

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HEALTH: RIGHT OR LUXURY?

by John Armstrong

"Look to your health, and if you have praise God, and value it next to a good conscience for health is the second blessing that we mortals are capable of; a blessing that money cannot buy."

Izaak Walton

FULL HEALTH is the epitomy of having the ability to live a full life. Society attaches great importance to health in its widest sense. Due to its fundamental nature economists have long endeavoured to provide a theoretical framework in which to study aspects of health. Its applicability to many fields of economics is apparent immediately.

This short discourse shall attempt to explain the economic significance of decisions relating to health care. More broadly it will also seek to develop a logic to the Governmental decisions in relation to the provision of health care. This will include amongst others thing an international comparison of the role of the state in the provision of health care and a brief analysis of the choices facing contemporary political leaders such as the American President.

IS HEALTH AN ECONOMIC GOOD?

Health is a wide term and encapsulates many concepts. Life expectancy is for many a crude indication of health. Another concept which is applied to health is the need for health care. This presupposes to some extent that such health care facilities are available to all. Linkage into the economic system by means of the existence of demand is immediately attained. However demand is not in itself a sufficient condition for supply.

Marshall defined an economic good as one which displays a number of qualities. More particularly it is one which is relatively scarce, provides utility and is transferable. Undoubtedly the subjective nature of scarcity makes these criterion slightly deficient in relation to health. The theoretical foundation for a proper health care service may lie in the subjective appraisal by many that scarcity of health exists and that transient ill-health must be removed at all costs, economic or not.

Aspects of health relating to utility have long been accepted. After all, existence is the basis of life. Consequently, the economic constrained optimisation of individual life cannot be solved without a sufficient level of health to ensure continued existence. For instance good health increases the productivity of labour. Transferability may seem absurd to many. Technology has long been assessed as a parameter for the optimisation of the production process. The effect of increased technology is clear. The advent of increased medical prowess through the development of a new technological framework has to a large extent in recent years removed this notion of the absurdity of the transferability of health. Processes such as the transplant of human kidneys which thirty years ago would have seemed illogical are now commonplace. Technology makes the seemingly impossible attainable. Through the research and development process health can now be characterised as a transferable commodity.

Consequently a strong argument may be put forward for the existence of health as an economic entity. In fact the health care industry is big business. More particularly, many argue it is the business of the governmental process to provide an adequate health service.

The Role of the State

The general philosophical debates of the eighteenth and nineteenth centuries were surrounded by the questioning of whether, if free play was given to the existing structures, they would of themselves provide harmony and social well-being. This debate is still relevant today.

This divergence to philosophical concepts provides the basis for government intervention in the health economy. The fact that health is fundamental to existence implies a strong moral reason why such actions should be forthcoming. This, combined with the purely economic reasons for the lack of supply in certain health markets provides a strong foundation for such intervention.

Governments' primary objective should be to act as rule-setters. The Libertarian Party of America in their 1992 Presidential election campaign leaflet acknowledges that "Governments' only role is to help individuals defend themselves from force and fraud". The fictional basis for a non-governmental economy is immediately eroded as this minimalistic rule-setting function definition acknowledges. Beyond such approaches, the underlying idea is that due to this inherent monopolisation of the powers of rule-setting, the state possesses special characteristics which provide the practical if not the moral authority for further functionary roles. Functions such as those of economic stabilisation, efficient allocation of resources and distribution (or more particularly "fairer" distribution) can be identified as being of fundamental importance and highly relevant to the economics of health.

Many argue consequently that by its nature equality of outcome is a

supposition upon which government intervention in the health market can undoubtedly be based. The reallocation of endowments can perhaps have its foundation in utilitarian classical micro economics. On a more practical basis justification of intervention in the health market can be based on the complexity and scale of the health care system It is said that its large role in everyone's life and consequently its sheer size makes regulation of the market by some method essential. The fundamental nature of health is also often provided as the basis of government intervention. On the basis of the value-judgement that life is sacred the case for such a role is argued. This is essentially logical but its authenticity is somewhat removed by the inability to analyse in quantitative terms the positive effects of state interference.

The social externalities dealt with by the provision of an adequate health care system are also cited. By the use of early protection and treatment facilities their prevalence may be great reduced. AIDS is a case in point. The inability of the free market to provide care at an optimal level for such patients is a clear justification for a State role in health provision. The underlying weaknesses in free-market provision outlined below perhaps provide the strongest reason for such interventionist behaviour. The sub-optimal performance of particular sectors due to large scale inefficiencies in the market provision of health entails a loss to society of a product which in its largest sense is a prerequisite for human existence. In a democracy, governments are elected by the people and should serve the people. Many economists cite this as a reason why the state should involve itself in the economy. If this accepted, health by its nature is top of the list for prescribed government actions.

Remedies for Action

Government intervention in the workings of the economy is primarily of two types. Regulatory or public expenditure methods provide the mechanisms whereby change may be enacted as the governmental authorities see fit. Conversely change for the improvement of the conditions of life is such a justification.The actual government intervention (or non-intervention) can be modelled on one of three broadly defined groups which are typified in the workings of the health system in many of the industrialised countries.

America is perhaps the purest example of providing private doctors and hospitals (with the government offering insurance) to some of its citizens not covered for ill-health by insurance. Ireland and Britain operate mostly under the Beverage model of publicly owned (or at least controlled) hospitals and state employed doctors. The hybrid model closely linked to the pioneering system introduced in Bismarck's Germany of the 1880s is epitomised most closely in Canada and Japan. It entails the institutions of the State almost wholly funding the health system which is in turn provided by private means. This outline of the cross-national methods of operation serves to highlight the considerable variations in the ways the major industrialised countries provide their health care. This divergence

is a manifestation of the large number of difficulties involved in measuring the productivity of health care instruments. Consequently the relative economic rates of return between the different governmental measures will never be able to be assessed in objective terms as may be the case with other areas of intervention. Subjectivity will be needed to be applied to derive the optimal decision as to government investment levels and the like. All this leads to a large diversity across countries in the variety of measures which may be adopted.

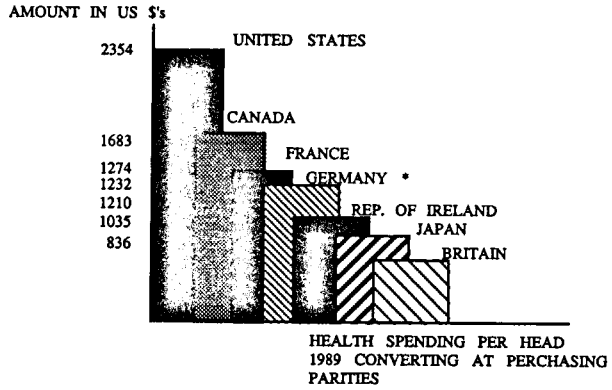

Figure 1

*GERMANY TAKEN AS THE OLD WEST GERMANY,

Presently America is providing the focus of attention for health enthusiasts. Former President George Bush prided himself in stating that America had the best health system in the world [2]. Perhaps this analysis is true. However the high cost, high tech., high intervention, yet highly privatised American system does have its flaws (Figure 1). Insurance bills are astronomical, so much so that the chief reason cited for business bankruptcies at present is the cost of health insurance. The spending of effectively 50% per capita more on health by the Government in the United States compared to Ireland demonstrates American difficulties of less than optimal efficiency. Yet the cost of insurance means that an unemployed United States worker goes without cover. This high price low effective quantity supplied is the classical characterisation of a monopolistic market structure. Part of the cause of these high prices may lie with a legal system which allows enormously high payouts to patients who sue their physicians (much the same way as the car insurance industry in Ireland suffers). Similarly, the workings of the market whereby preventative medicines are unprofitable for the profit-driven private sector thereby leading to no exchange at all taking place leads to a somewhat higher demand for health care demand than would have been otherwise necessary. The price distortions associated with such problems typify the inefficiencies, either purely economic or regulatory; inherent in the US health system at present. It is

ironic that the country that spends the most on health provides the least amount of health care for some of its citizens. Only by a radical restructuring will accessibility improve. However political divergence from economic rationality means that change is slow.

CONCLUSION

> *"Both the existing economic order and too many of the projects advanced for reconstructing it break down through the neglect of the truism that since even quite common men have souls no increase in material wealth will compensate them for arrangements which insult their self-respect and impair their freedom. A reasonable estimate of economic organisation must allow for the fact that..... it must satisfy criteria which are not purely economic"*
>
> *R. H. Tawney*

Economic rationing is a necessary evil. The lack of unlimited resources means that such methods are inevitable. The degree to which such methods should go provides the focus of debate. Is it preferential to treat some groups in society more fairly than others? The explicitness of the rationing process within the medical sector has provided scope for much debate. (For instance some have suggested that resources should not be spent on groups over a certain age thus condemning many to death.) By its definitional difficulty problems exist relating to the productivity of health. Resources consequently are easily deployed by providers in less than optimal utilisation. This added to the complex industrial structure of health care, makes inefficiencies more likely to exist. The role of the state should be amongst other things to regulate against such wastages. No method is perfect but by care and by structured analysis inefficiencies can be reduced.

If we believe that the objectives of the economic system are the sole essence of life then all actions will be influenced by such concerns. If on the other hand other goals exist they will at least be equally as important as the economic considerations. The industrialised world is now at such a wealthy level that reasonable economic inefficiencies which ensue from the provision of adequate and equitable level of health coverage should not matter.

NOTES

1. English writer.

2. Undoubtedly the level of technology is far superior to that of most other countries leading to perhaps a more specialised service.

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THE WHATELY PROFESSORS OF POLITICAL ECONOMY AND ECONOMIC POLICY 1832-1932

by Gareth Davis

"The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else".

J.M. Keynes p 383 of "General Theory".

IRELAND'S EXPERIENCES over this century inspired a host of prescriptions from a veritable galaxy of writers. Great economists such as Mill and Marx diverted much analytical firepower to the study of our situation. But what has been largely ignored by most commentators has been the role and influence of Irish economists in general, and of the Whately Professors [1] in particular, in the shaping of the political measures applied to our problems.

The boundary between what constitutes a contribution to theory and what exists as a contribution to the policy making process is an arbitrary and transparent one. Almost all economic theory, even at its most abstract and generalised level, poses implications for policy makers. However I intend to mark out my territory as being an examination of the work of these men which was specifically designed to influence governmental or political action rather than that designated to contribute to the general body of theory possessed by our discipline. But despite this delineation the overlap between the two areas will be, in many cases, quite substantial.

LONGFIELD AND THE FOUNDATION OF THE CHAIR

It is a commonly held maxim that classical liberalism and classical political economy were usually victorious together. Such was the case with political economy in Trinity. The actual recognition and creation of the Whately Chair by the college authorities and the appointment of the relatively Whiggish Mountifort

I would like to thank two holders of the chair Professor G.A. Duncan,holder from 1932 until 1967 and the current holder, Professor Dermot McAleese. I would also like thank Dr.Antoin Murphy. Their assistance and guidance proved of great help during my period of researching this essay.

Longfield as the first holder was a manifestation of the political ascendancy, at that particular moment in time, of liberalism, both within and outside the College [2]. This was the climate which had just seen the appointment of Bartholomew Lloyd, still revered as Trinity's great reforming Provost, and in which the Whig government had just succeeded in passing the great Electoral Reform Bill of 1832 which had widened the franchise enormously.

Montifield Longfield served as Whately Professor, for the first tenure of 5 years [3], from 1832 to 1837. For the last 3 of these he had to combine this task with being Regius Professor of Laws. During this limited period he acquired a formidable reputation as a theorist. No less an authority than Joseph Schumpeter, in his definitive "History of Economic Analysis", cites him as a man who "overhauled the whole of economic theory and produced a system (in 1833) that would have served well in 1890" [4].

His first contribution to the policy debate came in 1834 with the publication of "Four Lectures on Poor Laws". This pamphlet reflects the timeless concern with striking a workable compromise between compassion and economic efficiency when designing a system for the relief of poverty. It implicitly rejects an absolutist laissez faire approach stating that "every individual is entitled to the means of support .... from that society which would compel him to obey its laws" [5]. But it also points to the dangers which overprovision for the poor could pose in terms of undermining their incentive to work. In 1840 he wrote a piece on monetary reform calling for a state monopoly in the provision of currency in order to ensure a stable financial climate.

However Longfield's most major and enduring contribution to Irish public life, and one which has been grossly underestimated by historians, was on the land question. In the period 1858 to 1867 Longfield had first hand experience of the issues involved in the tenant right question as a judge of the landed estates court. Over this time he acquired a reputation as a staunch advocate of the rights of tenant farmers and of the necessity for legislation to protect those rights. His impeccable credentials as a judge and after 1867 as a Privy Councillor gave influence to his name.

In 1870 his proposals for ensuring the right of tenants to a fair rent, to fixity of tenure and to the free sale of any improvements, made known in the press as the "Longfield Scheme" were tabled in Parliament by the Liberal M.P. Walter Morrison. They were however, too radical at this stage for Gladstone, and became law only in a much more conservative form as the 1870 Land Act. This however implied a moral victory for the concept of tenant rights in that it contradicted for the first time, the absolute property rights of landlords.

Longfield is the forgotten idealogue of the Land League movement which ensued in the following decades. He provided the theoretical basis for much of their

ideology. As Moss puts it "by an unusual and perhaps unique marriage of Lockean and Benthamite principles, Longfield provided a philosophical underpinning for his advocacy of land reform" [6].

BUTT, HANCOCK AND THE FAMINE

Isaac Butt was appointed to the chair in 1837 as the second professor. He is primarily known as the father of the Home Rule movement in the 1870s. However Butt was also a notable economist whose contribution to the development of the theory of value is lauded by Schumpeter [7].

In 1846, whilst still a young Tory, he published a pamphlet entitled "Protection to Home Industry: some cases of its advantages considered". This piece consisted of a call for tariff barriers as a remedy for Ireland's stunted economic take off. Praised highly by his political opponents in the Young Ireland movement [8] this piece formed an important and perhaps crucial contribution to a body of protectionist thought which exercised much influence on Irish public life all the way up to DeValera's experiments in this century.

His second major policy work was published in 1847 at the height of the Famine and entitled "A Voice for Ireland: a Famine in the Land". It consisted of a powerful critique of the incompetent and incoherent government policies which had allowed this catastrophe to claim its terrible price in lives. It was widely read and drew much attention, especially in nationalist eyes, to the political calibre of the author [9].

Within many circles the name of the fourth holder of the chair, who was Professor from 1847 to 1852, is contrasted unfavourably with that of Butt's. William Neilson Hancock has remained a *bête noire* amongst many commentators on the famine. He is characterised as a dogmatic and callous advocate of a laissez faire approach to the problems involved with his pamphlet of 1847, "Should the principles of political economy be disregarded during the present crisis?", cited as evidence of this. Such a judgment underestimates the true ability of the man and obscures the real nature of the role which he played.

John Kells Ingram writing his obituary [10] leaves us enough evidence, especially in the light of modern theory, to refute this fallacy and to do justice to his memory. What Hancock advised during the early days of the Famine was not crude non-interventionism. Rather, what he advocated was that the state should provide direct cash payments to the poor in order to enable them to purchase food rather than trying to provide this food directly to them. Given that modern theory sees that most famines occur, not because of physical shortages of food, but rather due to a group's loss of purchasing power, purchasing power which gives entitlement to food, then perhaps Hancock's much abused prescriptions should be re-evaluated.

It is unfortunate that his controversial role during the Famine has obscured his other significant contributions to the administrative process in Ireland. He acted as the voice of one of the powerless groups in Irish society, the inmates of orphanages, and succeeded in gaining an improvement in their conditions [11]. Ingram describes his book of 1850, called "Impediments to the prosperity of Ireland", as "fitted to be a handbook for every Irish reformer" [12]. He also served dynamically as the secretary to the Irish Railways Commission. The weight of his influence can be gauged by the fact that at one stage Prime Minister Sir Robert Peel declared publicly that Neilson's writings were a major determinant in the shaping of his opinions towards Ireland [13].

Cairnes, Bastable and the American Civil War

The Whately Professor from 1856 to 1861 was a first rate economic theorist with an enduring and international reputation. John Eliot Cairnes has been described by R.D.C. Black as being, in his day, "the second best economist in the British Isles, surpassed only by John Stuart Mill" [14]. Along with Senior and Mill he was the pioneer in the development of a methodology for orthodox economics. His writings on the "gold" question were recorded by T.W. Hutchinson as being "amongst the most important works of the nineteenth century on monetary theory"[15].

Cairnes' work on the Irish land question was both influential and extensive (in its own right and by virtue of its impact on J.S. Mill's Irish stance) [16]. However it was his role during the American Civil War which gave international prominence to his name.

At the commencement of the conflict British sympathies, especially those of the political establishment, weighed heavily in favour of the South. It is conceivable that, had this mood persisted, Britain, at that time considered the world's policeman, may have eventually abandoned its neutrality and proceeded to intervene militarily in order to prevent the collapse of the South.

That this feeling did not persist is due in no small part to the work of Cairnes. His book of 1862, "The Slave Power", was described by Leslie Stephens as "the most powerful defence of the cause of the Northern States ever written" which "created a great impression both in England and America" [17]. It ran to two editions and was a best seller in Britain. It consisted of a penetrating use of economic analysis combined with acute historical observation which demonstrated how the whole Confederate economy rested upon the institution of slavery and how this institution, unless it was removed, would bar the social and economic progress of these states.

Cairnes' influence upon the whole nature of the relationship between orthodox economic theory and policy making was a very profound one. "The Slave Power" and other works of his dealt some fatal blows to the laissez faire dogmatists who held that the unregulated market would in all circumstances and in all case lead to a spontaneous and simultaneous maximisation of the welfare of each economic

actor. This was the group which clung to the precept of government non-intervention, (even to relieve social evils such as slavery), as some sort of transcendental law of science. Cairnes' achievement was that, whilst remaining a respected mainstream economist, he was able to show that "the maxim of laissez faire has no scientific basis whatever", but is " at best a mere handy rule of practice" [18]. John Maynard Keynes shares this view of Cairnes' role in the development of economics stating that he "was perhaps the first orthodox economist to deliver a frontal attack upon laissez faire in general" [19].

Professor Bastable, appointed in 1882, remained throughout his 50 years in the chair, somewhat reluctant to immerse himself in the hustle of political debate. As he states in the introduction to one of his most prominent works "I have not sought to specially discuss matters of temporary or local political interest, or to delude on the merits of conflicting arguments of party advocates.... For the purpose of scientific study it is the general and permanent aspects that require elucidation"[20].

However despite this reticence towards political debate Bastable enjoyed a notable career during which he made important contributions to the teaching of economics. A founding member of the Royal Economic Association, his 3 major publications "Public Finance"(4 editions over 1892-1903), "The Commerce of Nations" (nine editions over 1891-1923) and "The Theory of International Trade" (two editions, first published 1887) were standard text books in most British and Irish universities right up to the Keynesian revolution.

"Public Finance" was the first significant volume on the subject since McCulloch's book of 1845 and has been used as the definitive exposition of classical wisdom, on the topic [21]. The study of trade provided the inspiration for his other 2 widely read books. As an outline of the classical view of the dangers of protectionism, and of the merits of free trade, chapters 8 and 9 of the "Theory of International Trade" possess a timeless persuasiveness which remains relevant even to this modern age.

Bastable did however play a role in the internal politics of this college.He was involved in the controversy of 1910-11 as a representative of the non-fellow professors and lecturers who had risen in protest against their relatively powerless and subordinate position within the structures of the university. Later when this group had gained representation on the college board he sat as their member. He also served on the 1923-26 Fiscal Inquiry Committee set up by the infant Irish Free State [22]. However his impact upon the work and findings of this group must have been slight given his teaching burden, his previous shyness towards party political entanglements and the fact that his vision had by that stage been adversely affected by cataract problems. He retired in 1932, the 100th Anniversary of the foundation of the Chair.

Conclusion

This short investigation has demonstrated the significant role which even a small, though remarkable, group of economic thinkers and practitioners have had in shaping the nature of our present world. It hints at the powerful influence which economic thought can play in the formation of policy and shows the need for those who hold the reins over such logic to exercise responsibility and thoughtfulness in their work. On a lighter note I venture to hope that this study, by helping to unlock some of the rich, but often overlooked, heritage of economics at this college can provide a little inspiration to those of us at labour today.

Notes

1.The chair was named for Richard Whately, then the Church of Ireland Archbishop of Dublin and sometime Drummond Professor of Political Economy at Oxford, who provided the funding for the holder's salary at his own expense.This was set initially at £100 per annum. A century later in 1932 Professor Duncan's starting wage was £150!

2.Antoin Murphy constructs a powerful case for this view; casting the appointment of Longfield as a victory for the Whig elements on the College board and providing ample evidence of Longfield's Whig allegiances. See pp.13-25 in Murphy A.(ed.), (1984) "Economists and the Irish Economy" Dublin; Irish Academic Press.

3.The terms of the Chair initially set a tenure of 5 years. In 1887 this clause was removed (allowing C.F. Bastable to serve for 50 years).

4.p.465 in Schumpeter J.(1954)"History of Economic Analysis" London;Allen and Urwin

5.pp.153-179 in Moss L.S.(1976)"Mountifort Longfield; Ireland's first Professor of Political Economy" Ottawa; Greenhill

6.Moss op cit. pp 153-179

7.Schumpeter op cit p464

8.see chapter 4 in White T.De V.(1946)"The Road of Excess " Dublin;

9.White op cit chapter5

10.see pp.384-393 of "Journal of the Statistical and Social Inquiry Society of Ireland",November 1888

11.see Ingram op cit. pp 390-3

12.see Ingram op cit. p388

13.see Ingram op cit. p392

14.quoted in entry for "Cairnes, John Eliot" in "New Palgrave Dictionary of Economics" (1987)London;Macmillan

15.quoted in entry for "Cairnes, John Eliot" in "Encyclopaedia Britannica"(1963) London;Encyclopaedia Britannica

16.see pp 96-115 in Murphy A.(ed.) op cit.

17.quoted p 110 in Murphy A,(ed.) op cit.

18.quoted p 111 in Murphy A,(ed.) op cit.

19.p26 in Keynes, J.M.,(1926)."The end of laissez-faire."

20.quoted p 6 in preface to "Public Finance" (First Edition 1892)

21.see entry in "New Palgrave" op cit. by Bristow J.A. under "Bastable,Charles Francis"

22.see obituary for "Professor C.F. Bastable" written by G.A.Duncan in "Journal of the British Academy" 1945

Is What Economists Do Scientific?

by Mark Aplin

What is Science?

For knowledge to be scientific, it must meet some quite stringent conditions. The first of these is that the finding must be based on a systematic, logical theory. This theory, for it to be useful, must predict "successfully" [1] the outcome of experimental work concerning the finding. Thus we have the next condition, i.e. that it must be reproducible. For knowledge to be scientific, there must be set out a clear and systematic way in which the result could be verified by anyone with access to the necessary equipment. Thirdly, scientific knowledge should ideally be consensual. That is, it should be based on facts and principles that are unquestioned and firmly accepted by the majority of scientists. Finally, the messages deriving from the finding must be consensible [2]. By this is meant that the message should not be obscure or ambiguous such that no one is able to offer whole-hearted approval, or to challenge it with well-founded objections.

Problems with Science

Science repudiates philosophy. In other words, it has never cared to justify its truth or to explain its meaning [3]. Why should science feel the need to justify itself? Is not science self-justifying?

The concepts of consensuality and consensibility require that scientists hold similar premises, that everyone starts from the same point. Almost all scientists are brought through a formal education or training. Each scientist is taught that the world behaves in a particular way, and she or he will tend not to happily accept statements that are quite divergent from that which she or he has come to "know". Such tendencies towards this form of intersubjective agreement are not logically rigorous. Science thus can contain certain long held fallacies, ones which can only be dislodged by enormously persuasive events. We have little concrete evidence to suggest that the premises of scientific theory are in any way different in their fundamental essence, to those of any other self-accrediting group, such as a religious sect. Though it may be argued that science is open to criticism from everyone, in practice this is quite difficult when one thinks of the intellectual discipline inherent in the long process of becoming technically competent in any branch of science.

The method of falsification in science is perhaps its weakest point. Although the fundamental premises of scientific theory could conceivably be nonsense, this

is at once unlikely and not logically necessary, (i.e. they could feasibly, and logically be true, and indeed, experience would seem to suggest that they are true).

The experiment is crucial to falsification. Experiments may be undertaken for many reasons, and they may have many interpretations. However, one thing which they all have in common is that they are "specially contrived observations, carried out under controlled, reproducible conditions". There we find a paradox; one cannot step into the same river twice. Thus, implied in the whole ethos of experimentation is the assumption that nature is uniform. Falsification and prediction are inextricably linked, for to be falsified is no more than making an incorrect prediction. Thus a theory which in principle cannot be falsified, has no predictive use. We must ask ourselves whether prediction is a logical corollary of experimental data. Because something happens once does not necessarily imply that it will happen again. The lack of logical rigour in this area of science is rarely commented upon.

In science, we seek to transcend the here and now, to rise above and to gain a view of the explanatory laws of nature. Without a strong metaphysical belief in a degree of permanence, of order, of continuity from one period to the next, science collapses. Such a principle, however lies outside the scheme which it is called to dictate. Demonstration of successful prediction is not a particularly compelling piece of technical logic. Without attaching supreme importance to it, however, the heart is taken out if science. We need science to tell us what is going to happen, and we are impressed because, more often than not, its predictions prove valid. We are delighted when particle physics predicts correctly the existence of quarks. We are similarly impressed when the science of NASA can predict the trajectory of a space capsule. However, many findings in the natural sciences rely upon metaphor, upon intuitive plausibility. Kelvin's mechanical model of ether and the Rutherford-Bohr picture of the atom as a planetary system of electrons orbiting the nucleus are appropriate illustrative examples. It is argued that the critical success achieved by the latter model was as much due to our familiarity with such systems in astronomy rather than to its intrinsic theoretical foundations. Quite often, scientific findings stem from completely atheoretical foundations; are these any less scientific? Having explored the bases of the scientific, I now ask whether economics qualifies for scientific status?

Is Economics a Science?

Economics has a rigorous theoretical underpining. It has internally consistent theories regarding market structure, price theory, consumer behaviour, externalities, and many other economic concepts. Economics is also consensible, and has become increasingly so with the mathematisation of the subject. Ordinary conversation tends to use language in a loose, inconclusive, and finally ambiguous way. Even legal "science" is handicapped by loopholes and inconsistencies. A science cannot be built on such foundations. Thus language must be formalised. Messages

must be made absolutely clear, with the discussion consisting of technical terms which have previously been defined with logical rigour. Thus, with each word becoming more and more tight in its meaning, the end result will be that all words are defined by their relationship with others. This language is mathematics. Messages in mathematics are not only universally understood in a uniform manner, but are also unparalleled in terms of precision and clarity.

Upon such analytical bases is economics built. Perhaps more importantly than all of these is the fact that economics seeks to understand that which we feel needs to be understood [4]. This is perhaps the fundamental quality for all sciences.

How Does Econometrics Contribute?

Econometrics is primarily concerned with measurement and consequent upon this, prediction, a topic treated in an earlier section. The cornerstone of the scientific method is collation of theory, performance of experiment and then the synthesis of experimental data with theory. As I have mentioned, such an approach demands some quite strenuous assumptions if it is to serve as the basis for belief in science's predictive power. Such experimentation is the role of econometrics. However, in economics, as in most social sciences, prediction has been notoriously inaccurate. Why is this, and does it have any implications for the scientific status of economics?

In the natural sciences, the parameters within which scientists work are perceived to be quite stable. It is assumed to be the case, for example, that an atom of carbon 12 will equal a specific number of atomic mass units, and that this will be true for any non-charged atom of carbon 12. Similarly relationships between "actors" in the natural sciences are predicted accurately, and are thus assumed thus to be known - adding a specific quantity of heat to a known volume of water will lead to an accurately predictable increase in the temperature of that water, due to the already "known" specific heat capacity of water. In the social sciences, however, there is no such luxury. We must deal with largely unquantifiable parameters and relationships, ones indeed which are rarely static. This is further complicated by the widely held belief that much human behaviour on a micro level has a substantial random element: the price we pay for imperfect information and free will. The result is a significant degree of unsystematic behaviour, or, econometrically speaking, a large error term. (Worse still, a model which has shown good predictive power for last year's data (the data upon which this model is based), may be quite misleading this year due to a shift in the parameters, or due to the introduction of a new variable in the form of another interrelationship.)

The imperfect nature of measurement in economics has nurtured the development of divergent schools of thought, who agree in broad terms with regard to the nature of economic forces, and to a great extent on the direction of economic changes, but find that they disagree vehemently upon the magnitude of the

elasticities of such relationships. Thus Keynesians may argue strongly that the LM curve is flat, while monetarists insist that it is steep. Such differences of opinion are perhaps minor - they do not disagree about the sign of the slope. However, it is worrying from a scientific point of view, that economists can argue so long and so hard regarding what are basically empirical issues. While the natural sciences are refered to as maps of countries which we cannot visit, economics is perhaps akin to disagreeing regarding the dimensions of the country, rather than a disagreement about where it is. The worrying question remains of whether or not economic data is inherently weaker than economic theories. Of course we cannot answer this, because with substandard data falsification is rendered impossible.

It should not be imagined that the natural sciences rely solely upon rigourously proven experimental data, backed up with concise, intensive theory. Much in the natural sciences relies upon such unscientific concepts as rhetoric and visual perception. This is especially the case with regard to path-breaking discoveries. No data can be expected to fit the predicted course perfectly. This may be due to a number of reasons,such as technical inaccuracy or impure compounds. Thus it must be decided how close is close enough? This is done by a combination of skill and experience. There is, even in particle physics, a certain degree of art involved. For many reasons theories are seldom confirmed solely through experimental findings. It is rare that the correspondence between theory and experimental data lies within the error of observation. It is usually considered a success if the model corresponds qualitatively with reality; that is if predicted peaks are associated with peaks etc.. Therefore, the pre-eminence which Popper places upon falsifiability as a criterion for scientific theory is, in practice, hugely limiting, as every theory is to a lesser or greater extent falfsified by the relevant data.

All of this goes to show that we in economics should not be overly embarrassed by the problems affecting our empirical data, and the weakness of the data fit. There are, however some problems specific to economics, the most significant of which is the quality of data. Leaving aside the issue of errors in data collection, the major problem faced is that almost all economic data move in similar and simultaneous cycles. Thus, for example, budget deficits tend to go up when unemployment goes up. This does not of course mean that budget deficits cause unemployment, but rather that ceteris paribus, a downturn in the economy tends to lead to increases in unemployment, a decrease in the tax yield and a consequent increase in budget deficits. Incorrect inferences regarding causality, though a possible consequence, is not the main issue, however. The multicollinearity of data, as it is known, makes the modelling of economic relationships an alarmingly hit and miss affair, with determination of statistical significance for each individual independent variable becoming impossible without major manipulation. Economics has the added problem that, dealing as we are with cognitive human beings, the findings of economic research can in and of itself change the behaviour of economic agents. An optimistic economic forecast might increase investment etc.. With problems of this sort inherent in economics, there must be serious question marks

over the reliability and usefulness of econometric work.

The ultimate question which must be asked with regard to the significance of econometrics in economics is what does one do when econometric results are in conflict with economic theory? What must give? If econometric findings point to investment increasing, ipso facto, with increases in interest rates, what lessons do we derive? Though there is a temptation to dismiss such findings as interesting aberrations, is this doing econometrics justice? I refer the reader to the point mooted earlier regarding the relative strengths of data and theories.

Fundamentally, while measurement is not crucial to science, it has a role to play. The problems discussed in earlier parts of the essay must not be allowed to over shadow the achievements of science which have been due to the use of quantative methods. However, due to the flux of the bases of economic modelling, the random nature of much human activity, and the fact that econometric work can affect that which it is trying to measure, econometrics clearly has the cards stacked against it.

One final point should be made regarding the quantification of economics. Certain economic behaviour cannot, be satisfactorily modelled by mathematical models, (by present mathematical techniques at least). Such a desire to quantify can and has led to certain unsystematic aspects of human behaviour being swept under the carpet. This is regrettable. Economics seems to feel that "scientific" may be defined as " being like the natural sciences". Indeed the majority of this essay reflects this premise. If one drops this, and instead searches for a more liberated, general theory of science, we may find that economics fits quite well.

NOTES

1. The precise meaning of this term is unclear - this will be discussed later.
2. The term consensible is borrowed from Ziman's "Reliable Knowledge".
3. See p25 of Whitehead (1926), "Science and Technology".
4. This, I understand, is one of Popper's criterion for a science.

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NEO-PROTECTIONISM EXTENT & REASONS

by Uwe Ketelsen

INTRODUCTION: POST-WAR TRADE LIBERALISATION- TO WHAT EXTENT?

BETWEEN THE GENEVA Round in 1947 and the Tokyo Round (1973 to 1979) numerous steps were taken towards world free trade. Average import tariffs on manufactures fell from 40% in the early 1950s to less than 10% in 1974 (World Bank, 1988). In 1983 average applied tariff rates had fallen to 2.5 - 3.2% in the European Community (EC), 4.0 - 4.4% in Japan and 2.3 - 3.5% in the United States (US) (Grilli, Sassoon, 1990). In particular the so-called Kennedy-Round and the Tokyo-Round of the General Agreement on Tariffs and Trade (GATT) brought significant results, and there were even efforts made to bridge the gap between First and Third Worlds. For example, the General Systems of Preferences (GSP) was supposed to be an instrument to promote trade liberalisation amongst beneficiary less developed countries (LDCs) and to support their exports to the developed countries (DCs). However it would be wrong to view this period wholly as a *"Golden Age of Free Trade"*.

The agriculture and textiles and clothing sectors, in particular were subject to highly protective policies even during this time. The Common Agricultural Policy (CAP) of the EC and the Multifibre Arrangement (MFA), (ironically developed under the GATT-umbrella) have their origins in the 1950s and 1960s. The GSP was distorted by special agreements and restrictions and had a utilisation rate of only 35 - 36%. According to Secchi (1990) it even has some indirect protective effect. We must bear these in mind when talking about post-war "liberalisation".However the major task of this essay is to describe the comeback of protectionism since the mid-1970s; its character, its extent and the reasons behind its return.

THE RESURGENCE OF PROTECTIONISM SINCE THE 1970S

The results of the Tokyo Round in the end of the 1970s were the "last hurrah of free trade" (Gray, 1985) in both LDCs and DCs. The roots of the new protectionist wave, which impacted in the 1980s, lie to a large extent in the 1970s. The World Bank (1988) states that the intensity of protection broadly declined until 1974. It

was then that the pattern changed.These new restrictive policies differ from the traditional and well-known strategies. The new protectionism is highly sector-specific, often country-specific, and is not specifically a product of economic nationalism or of neo-mercantilism. The new trend thus involves a growing tendency for non-discriminatory trading policies to be replaced by bilateral or other discriminatory arrangements. Despite the fact that the Tokyo Round also embodied some moves towards elimination of some major non-tariff barriers (NTBs), the use of this instrument gained enormous popularity. By the end of the 1980s 25 to 30% of world trade was administered through NTBs (Grilli, Sassoon, 1990).

The Nature of Non Tariff Barriers

Non-tariff barriers is a generic term for policies such as import quotas, voluntary export restrictions (VERs), the requiring of administrative authorisation from importers, price monitoring procedures, the enforcment of health, technical, or product standards and the discriminatory use of state contracts to favour the indigenous sector. Bhagwati (1988) calls these NTBs "administered protection" because their use does not necessarily imply legislation.

NTBs are difficult to detect. It is nearly impossible to calculate the effects of an NTB. Whilst the decreasing of tariffs create a measurable benefit to other countries and thus have a significant "public relations effect", a country hardly puts itself in the pillory by using NTBs. In addition, NTBs may greatly differ in their degree of restrictiveness; for example, an import license might be granted very liberally and only have a slightly protective character. Ethier(1988) reports many widely used measures which, despite infringing upon the spirit of GATT, are consistent with it in letter. These include

- safeguard measures
- anti-dumping duties (ADs)
- countervailing duties (CVDs)
- responses to "unfair" trade practices

Some Data on the Extent and Costs of Neo-Protectionism

The trade-weighted average applied tariffs of the major developed countries went down to 2.5-3.4% in 1983 (UNCTAD, 1987), but despite this, 60% of agricultural products and 78% of industrial products are still subject to tariffs (Secchi, 1990).Both industrialised and developing countries tend to have relatively high tariffs and relatively abundant NTBs on those types of products which developing countries tend to export. In spite of the extent of GSPs, discrimination by industrialised countries, especially by the EC against developing countries is

enormous (see Table 1 in appendix). Roughly 20% of the exports of LDCs were directly covered by NTBs in 1986 (World Bank, 1988). Nearly half of world trade in agricultural food products, and 25 to 30% of trade in manufactures is regulated through NTBs. Likewise a study by Finger and Laird (1987) shows a dramatic increase in recent years especially in the use of hard-core NTBs (see Table 2 in appendix).

An empirical study by Laird and Yeats (1990) shows that, overall, the share of DCs imports affected by NTBs nearly doubled between 1966 (25%) and 1986 (48%). The EC shows an increase in coverage of 33%, while the level of US NTB coverage went up by "only" 9%. The same study shows that NTB coverage amongst textiles and clothing has increased from 30 to 89%. Whilst $30 billion of OECD countries imports were affected by NTBs in 1966 ($100 billion in 1986 prices), $356 billion was affected in 1986. Taking steel, automobiles, motorcycles, consumer electronic products, textiles, and footwear together, the estimated number of NTBs quadrupled between 1968 and 1983! For example, in 1973 less than 1% of the automobile trade of the OECD countries (excluding trade with the EC) was affected by discriminatory restrictions, in 1983 this proportion had risen to 50% (OECD, 1985).According to Bhagwati (1988) between 1981 and 1986 the import-coverage indexes of NTBs went up by 18 to 23% for the cases of the major trading areas, (Japan however was an exception to this trend). By 1986 roughly 20% of the LDC exports were directly covered by NTBs (World Bank,1988).

While in the early 1970s there were less than a dozen VERs, affecting only a few countries, in 1986 there were 99 major known VERs, especially in steel and agriculture (including the Multi-fibre agreement). 55 of these were imposed by the EC, 32 by the US, 14 affected Korea, and 24 Japan. The share of exports under restraint in the Asian Newly Industrialising Countries (NICs) and Japan went from 15% in 1980 to 32% in 1983 (Grilli, 1990).

There are only partial estimates as to the costs of these policies: in the case of agricultural protection, the annual domestic costs of the EC's Common Agricultural Policy (CAP) reached to about $ 13 billion per year in the mid 1980s. According to an estimate by the World Bank (1988), the costs of protecting agriculture reached 3% of the total farm output in the US, and 16% in the EC. Main victims of this policy are the LDCs. The costs of the industrialised countries protection against developing countries range from 2.5 to 9% of the LDCs GNP; from the DCs point of view the domestic costs of protection range from 0.3 to 0.5% of their GNP (World Bank, 1988). NTBs, offer no revenue to the protecting country and are more damaging than ordinary tariffs; for example, VERs are estimated to cost the importing country up to three times as much as the equivalent tariff protection would (World Bank, 1988).

RATIONALE FOR THE DECLINE OF FREE TRADE

A country's comparative advantage is not "carved in stone". The performance first of Japan, and then in the 1970s of the NICs and the Newly Exporting Countries (NECs) with low labour costs, (and in the case of Japan extremely high levels of productivity) have led to a new international division of labour. These changes in comparative advantage were enormous; for example, the NICs share of world exports of manufactures doubled from 6% in 1963 to 12.1% in 1986. The difficulties in adapting to these changes generated a demand for assistance to socially important industries – traditional labour intensive and vital sectors like textiles, footwear, steel and the chemical industry. This is manifested in the fact that the NTBs of the EC and the US are concentrated in sectors which NICs have a strong and growing presence.

The argument of protection being put in place in order to counteract "unfair practices" is an old one but still remains fashionable. The new protectionism reveals a desire to strike at imports from those producers whose price behaviour was considered most deviant. The excessive use of antidamping measures and countervailing duties is evidence of this attitude.The call for retaliation also rises when home exports are discriminated against on foreign markets. Last Autumn, the US threat to impose tariffs on European products after fruitless GATT negotiations was immediately followed by thoughts about retaliation on the EC side, especially by France.

Doubts as to whether the market is able to arrive, unassisted, at an optimal resource allocation and a satisfactory income distribution have led to the demand to defend existing standards of living and patterns of income allocation by means of protective measures. Neo-protectionism could thus be interpreted as a by-product of the welfare-state. However, such policies directly contradict the theories of welfare economics. For example, European agriculture lives a heavily subsidised and protected life, although a reduction in the size of this sector would easily satisfy the compensation principle. Losers like the farmers could, at least hypothetically, be compensated by gainers(in this case tax-payers and consumers).

The comparative performance of the world's economic main powers is also relevant. Trade liberalisation might be defined as a public good which is provided only if there is an actor in the system large enough not to be deterred by the presence of free-riders and powerful enough to impose discipline if free-riding in the system becomes excessive. The US hegemony in the world of trade has declined (Pearson. Riedel, 1990, Bhagwati, 1988). Hence this may be reflected in a rise in the level of world wide trade barriers.

CONCLUSION

Assuming that all politicians and policy-making economists know about the gains to be had from trade(at least in theory), it is hard to understand why there seems to be a "Law of Constant Protection": if one kind of protection is reduced or removed, another variety simply pops up elsewhere (Bhagwati. 1988). The reasons listed above may give an idea as to why barriers to trade exist and indeed are increasing in number but further investigation is required. The study of the Political Economy of Protection which deals with protection as a good with a certain demand and supply offers a promising avenue of exploration in this regard. It is also important to mention that any policy recommendation (such as the advocation of Free Trade) that derives from a theoretical construct is only valid if the underlying assumptions are compatible with reality.This fact must enter into the minds of policy-makers.

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APPENDIX

TABLE 1: (ADAPTEED FROM SETCHI, 1990)

Percentage of Industrial country imports to 'hard-core' NTBs. 1981 and 1986

	INDUSTRIAL COUNTRIES		DEVELOPING COUNTRIES	
	1981	**1986**	**1981**	**1986**
EC	10	13	22	23
Japan	29	29	22	22
USA	9	15	14	17
All Industrial Countries	13	16	19	21

TABLE 2: (ADAPTED FROM FINGER, LAIRD, 1987)

IMPORT COVERAGE INDICES OF NTB'S APPLIED BY SELECTED DEVELOPED COUNTRIES 1981-1985

	1981	1982	1983	1984	1985
All Products					
All NTBs	100	104	105	72	74
Hard Core NTBs	100	104	106	109	110
All Products Except Fuels					
All NTBs	100	108	110	114	119
Hard Core NTBs	100	106	109	114	115

DO PRICES MATTER?-THE CASE OF THIRD WORLD AGRICULTURE

by Deborah Heaney

THIS PAPER AIMS to answer two questions about prices in agricultural markets in the Third World:

- Is pricing important?
- Should governments intervene or leave pricing to the markets?

Such questions relate to any economy, in the developed or underdeveloped world, and reach deep into the foundations of many economic policy conflicts. The paper begins by discussing the importance of food prices in the economy, before examining the details of operational direct and indirect pricing policies, and then recommending, with some qualifications, a new orientation for policy, one that firstly makes markets workable and then, and only then, leaves pricing to the market.

ARE PRICES IMPORTANT?

> *"Prices fulfil three functions: they are signals, incentives and instruments for the allocation of resources and incomes." (Streeten)*

Accepting this quotation, then surely pricing is important. Distorted prices give the wrong signals and incentives and do not contribute to the economic objectives of equity and efficiency. In any society food prices are key prices, having implications for the purchasing power of all as well as specifically for the level of income of the agricultural population; a particularly salient point in the Third World where in 1985 74% of the labour force were involved in agriculture. (World Development Report 1988)

NATIONAL POLICY BIAS

An important influence on Third World agricultural policy has been the assumption that industrialisation provides a route, if not the only route, to development. This dual economy Lewis type model holds an industrial-agricultural inequality as a necessary driving force to achieve growth and development. The overemphasis on the factor role in Kutznet's outline of the three contributions[1] of agriculture to the process of development reflects this, in that agriculture becomes

viewed solely as a source of capital and extractable surplus, at the cost of its other two possible contributions. It is often suggested that this is reflected most clearly through an urban bias in policy. Food pricing policy in particular, and also the direction of investment reflect this with the net result of reducing incentives to agricultural production. This was demonstrated by 1986 World Bank data which focused on Columbia, Egypt and Nigeria.

Direct pricing policy tends to result in the depression of agricultural prices which is often justified on the grounds that the Third World farmer is a non-rational man who has a target income and thus does not respond to price increases by increasing output and that supplies of cheap food are necessary in order to feed the population and in particular the expanding urban population.

Evidence on the "non-rational" Third World farmer would seem to show that farmers are in fact rational and, depending on resources available, will increase production in response to price increases. Widely used direct policies include compulsory government purchase of food for domestic markets and the imposition of taxes which reduce producer prices(a convenient revenue raiser). Export taxation accounts for the contrasting experiences of Sri Lanka and Kenya in the tea market and China and Cote d'Ivoire in cocoa, in each case the former imposed export taxes and lost market share due to reduced exports.

Ironically policies with the goal of favouring farmers often have what Lipton calls a "price twist" so that those who benefit the most are those with the greatest resources originally. Subsidised inputs are often associated with administrative difficulties and corruption in bureaucracy so that most of the potential surplus is eliminated by bribery or that most of the value accrues to larger and richer farmers. For instance in Brazil in the 1970s, credit subsidies were diverted to non agricultural usage. Tax reliefs to favour agriculture in the same country favour large farmers and the accumulation of large land holdings - particularly as the poverty stricken do not pay tax anyway given that their incomes are so low.

Overall macroeconomic policy also often reflects a strong anti-agricultural bias with effects on agricultural prices. Primarily this occurs through import substitution measures with which over-valued exchange rates are associated. Protection of local industries may also force farmers to purchase domestic inputs at uncompetitive prices. Resources tend to move to the protected sector, and traded goods are less protected so that agricultural exports are heavily discriminated against. In the Philippines between 1950 and 1980 the prices of agricultural exports were artificially depressed by between 44% and 71%.

INTERNATIONAL POLICIES

The price problems in agriculture stem not only from national intervention, but also from effects of international policies. The prime example of this is the EC's Common Agricultural Policy which subsidises EC agricultural output. The excess production resulting from such massive subsidisation programmes lowers world food prices for these products. Liberalisation of agricultural markets through CAP reform would benefit producers through higher world prices whilst damaging consumers where food is imported (Matthews 1985). Freeing up these markets may thus bring its own problems. The World Development Report 1982 reports that in developed countries, producer prices are 50%-100% above world market prices, in contrast to less developed countries where prices are well below world levels, often due to the policies outlined above.

Tyers and Anderson simulated the effects of lower trade barriers, with results indicating the strong benefits of trade liberalization for selected sets of commodities. Higher import bills for LDCs could occur but the 1986 World Development Report suggests that this would be more than offset by the gains from exports of other commodities. Overall it seems that international intervention in markets is costly and inefficient and highly politically motivated especially where it involves giving favoured status to ex-colonies and political allies.

Another international aspect to agricultural pricing is the provision of food aid. It is often the case that food aid only displaces and does not add to the overall supply, especially as its provision tends to reduce prices, thus reducing the incentive to produce and perpetuating the domestic problem it seeks to alleviate, by creating long term dependence. The effectiveness of food aid depends on its targeting so that it will prove effective and yet have no negative effects on production.

DO PRICES MATTER? - A ROLE FOR GOVERNMENT

It follows then, without question that in the Third World agricultural prices are distorted by both national and international actions. The question begs answering — does this matter? Does the Third World farmer have an upward sloping supply curve or does he operate under the concept of a target income and is, consequently, unresponsive to price changes. Evidence suggests that increased prices may benefit only those who have land and technology available — production will only increase where opportunity as well as incentive exist. Thus prices matter but they are not all that matters.

What is the role for government policy in such a context? It is to this that Lipton addresses himself in an article discussing the standpoints of two World Bank Reports, the 1986 World Development Report and a report called Poverty and Hunger by the Agricultural Research unit of the Bank. He sees the World Development Report as promoting a "pricist" strategy, emphasising the price distortions

outlined in the previous parts of this essay. Lipton feels that this ignores the root of the problem, which is at least in part the social and political structure of the country - evidenced not only by bias in pricing but also witnessed in investment policies. He suggests that sole dependence on prices and free markets as a solution to problems may be damaging and that other considerations may also be important.

The argument suggests itself that perhaps getting prices right is the solution but only if markets are freely operating. If the ability to respond to price changes does not exist, then getting prices right may at best have no effect and at worst cause further distortions. As Lal espouses in his book "The Poverty of Development Economics", correcting one distortion with another is an ineffective and potentially damaging policy. It is unlikely that anyone knows what the "right" prices are or that any government knows how to attain them. The farmer faces a constrained maximisation problem: maximise income which is a function of price and output, subject to a technological constraint, availability of land and water, a capital constraint and human capital. The role for government should be to relax these constraints thus ensuring effective operation of markets - in this context increasing efficiency will have equity impacts for agriculture.

Conclusion

In conclusion the realisation is required that resources cannot be continually extracted from agriculture without expecting an effect on performance and a potentially problematic one. Land reform so that adequate access to land is provided, increased access to technology especially labour using technology such as high yield crops, are possible ways of increasing responsiveness and thus the agricultural sectors ability to take advantage of opportunities. The benefits of crop research contributed to Brazil's soya bean success in the late 1970s. Irrigation not only benefits agriculture but also rural employment in construction as was indicated by a World Bank study of a Malaysian irrigation project. Government insurance schemes could also perhaps respond to the risk aversion of farmers. However on the other hand evidence from Indonesia shows that the curtailment of government intervention in one case resulted in the setting up of profitable lending arrangements and the improvement of credit availability.

Prices then do matter, but only as one element of agricultural markets. The priority for any government must be to ensure that opportunities exist to take advantage of incentives before pricing policies favouring agriculture are used.

To summarise,

"Getting prices right is not the end of economic development but getting prices wrong frequently is."(Timer 1984)

NOTE

The others being defined as that of providing products (i.e. food and raw materials) and that of forming a market for the goods of other sectors.

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THE EMS -IN THEORY AND IN PRACTICE

by Ronan Lyons

INTRODUCTION

This essay analyses the rationale behind the adoption of a fixed exchange rate regime and the pertinency of such a rationale to the EMS. I will start by delimiting the costs and benefits of EMS. membership, in the context of its objectives, firstly from a monetarist and then from a "non-monetarist" perspective, particularly as they apply (although not exclusively) to the weaker, peripheral countries of the EMS (for the purposes of this essay I will define these countries as being those other than Germany, France, and the Benelux countries). Finally I will attempt to assess whether or not the EMS. has achieved its goals, particularly as viewed in light of the recent turmoil on the European currency markets.

THE THEORY OF FIXED AND FLOATING EXCHANGE RATES

The most widely discussed arguments both for and against a greater degree of monetary integration in Europe have been based largely on a monetarist model. The discussion of monetary policy and alternative exchange rate arrangements is typically biased towards the relationship between money and inflation, often either ignoring the real impact of monetary policy on output employment and growth or treating it as a transitory phenomenon.The standard arguments can be termed monetarist because they focus on the objective of reducing inflation and rely upon the causal mechanisms implicit in the quantity theory of money as a means to this. Put briefly, the argument is that control over the rate of growth of the money supply is necessary in order to control the rate of inflation.

The traditional monetarist position as embodied by Walters (1986), Laidler (1990) and Friedman (1953) is that a flexible exchange rate regime is necessary in order to facilitate individual countries' control over their own inflation rates.These writers would favour national monetary autarchy essentially in order to leave national monetary authorities free to implement "tight money" or tough anti-inflation policies in their own country. The monetarist case for joining a fixed exchange rate regime is just the reverse of this argument. Under a fixed exchange rate regime, defence of the existing exchange rate implies that the individual nation must accept the average inflation rate of the system as a whole, which is determined by the "monocentre" of the system (Hicks,1982) i.e. Germany in the case of the ERM. As Germany has a reputation for "sound-money", many monetarists are

prepared to allow the Bundesbank to set the system wide rate of inflation. However, this case has been weakened substantially in the light of the inflationary pressures generated by German reunification and the consequent punitive interest rates set by the Bundesbank.

Of the two monetarist arguments, it is clearly the position of the flexible exchange rate advocates which is the more intellectually coherent. If low inflation is the over riding objective there is no reason why domestic political and economic institutions cannot deliver it. This argument of course would not be applicable to a small open economy (such as Ireland) where the nature of the exchange rate regime is essentially irrelevant. Although a change in the exchange rate regime may change the mechanism by which the small country adjusts to policy changes emanating form the monocentre, it will do nothing to remove the final necessity of adjustment. (Smithin 1991)

However, medium sized financial powers will still have important decisions to make about their relationship to the financial superpower. These intermediate nations may not be powerful enough to affect the fortunes of others but they may have sufficient "credit" to exercise a degree of interest rate autarchy if they choose. In such cases the nature of the exchange rate regime becomes crucially important. The retention of the possibility of exchange rate changes will allow for the emergence of forward premia and risk premia (or discounts), and hence at least some scope for a different interest rate policy than that of the monocentre. (Hicks, 1982)

However, the economic basis of the case for flexible exchange rates is not as strong as it was once believed to be. (Laidler, 1990). The old Philips curve analysis which postulated a trade-off between inflation and unemployment, and hence provided a rationale for expansionary domestic policies and thus a flexible exchange regime, has been largely discredited. The curve exists as an apparently stable relationship only as long as economic agents' expectations of inflation remain stable over time. This is clearly not the case. Consequently the postulate of a long run inflation-unemployment trade-off has turned out to be illusory. However Friedman (1953) believed that there was a strong political element to the case. A flexible exchange rate confers on the domestic authorities a certain degree of short run room to manoeuvre in the conduct of stabilisation policy. But that is not the main point: a flexible rate also permits them to pick the path of domestic inflation even in the long-run. Consequently, it is argued that flexible exchange rates are the natural institutional arrangements in a world in which political power is still largely exercised at the level of the nation state, and in which electorates expect their governments to make effective decisions about the inflation rate.

A Non-Monetarist Critique of the EMS

The debate as to the relative merits and demerits of the EMS has also encompassed the theory of optimal currency areas. An O.C.A. is defined as a group of economic entities (individuals, regions, or countries) among which welfare is maximised through fixed internal exchange rates or a common currency and a flexible exchange rate towards the rest of the world. (Mielsen et al 1991) It is argued that co-operation amongst such economic entities leads to microeconomic efficiency gains through a dampening of exchange rate uncertainty, facilitating trade and, in the case of a full monetary union, eliminating foreign exchange transactions costs.

However, viewed from the outside it is something of a mystery as to why the conventional wisdom in Europe holds that a common currency, or, at minimum, a set of fixed exchange rates is necessary to prevent the introduction of trade restrictions within the EC. Indeed Eichengreen (1990, p12) remarks that "The belief that fixed exchange rates are needed to obtain the benefits of a customs union is a recent and peculiarly European view". It can be argued that there is really no reason why in principle the existence of different currencies, subject to exchange rate changes, should in itself provide any serious barrier to trade. It is not at all clear that the costs to society of "insurance" through the provision of hedging instruments is any greater than the cost of maintaining a rigidly fixed exchange rate regime. This point is particularly salient when viewed in the light of the recent large scale speculations against the weaker currencies in the EMS.

Typically it is argued that any system of fixed or semi fixed exchange rates ought to put the lowest inflation country in charge (for example The Economist 6 Jan 1990). Whereas high inflation countries are under constant threat of having to devalue their currencies, low inflation countries are under a corresponding pressure to let theirs appreciate. However, most governments find devaluing their currency much more embarrassing than revaluing it. It is argued therefore that fixed exchange rate systems should have a natural bias against inflation. However, there is a danger that this anti-inflationary bias could become an excessively deflationary bias. Departing from the monetarist approach, I have outlined earlier in this paper, it may be suggested that monetary policy is indeed important for real economic outcomes: the decision to enter a fixed exchange rate system and to submit to the hegemony of the monocentre may not simply be a matter of accepting a different inflation rate than the one that would be "chosen" domestically but of accepting a different growth rate or unemployment rate as well. In particular the medium sized financial power forgoes a potential "escape route" from a deflationary pressure emanating from the centre, which might otherwise have been available (Smith 1991,de Grauwes 1990).

Most expositions of the concept of the OCA have essentially made the point that the area should comprise units which have both a similar economic infrastructure and a high degree of factor mobility (particularly labour mobility) between

them. If economic conditions are dissimilar across regions, unpredictable shifts in demand may well lead to situations in which the principle industries in one area are depressed whilst those in the other are booming. A common monetary policy which would be focussed on reducing inflationary pressures in the latter region would simply exacerbate the depression in the former. These regions are not OCAs and would benefit from exchange rate flexibility between them. Such an analysis could be applied to the core and periphery countries of the EMS. Eichengreen(1990) discusses in some detail the case of Puerto Rica which is very pertinent to the case of the EC, in that even though the island is a full member of the American "customs and currency union" there are obvious cultural and linguistic barriers to full factor mobility and these do seem to have had an impact.

Proponents of a fixed exchange rate must argue that the inevitable discrepancies in regional economic performance can be ironed out by mobility of the factors of production rather than by separate monetary policies and exchange rates. In the case of a full currency union (EMU), where depreciation is completely ruled out the restoration of competitiveness would require that there must be a downward pressure on regional money wages and costs. This will surely be resisted both for traditional reasons and because the linkages implicit in the currency union will encourage the use of bloc wide comparisons of relativities and norms in wage bargaining (Mielsen et al 1991). Both the resulting unemployment and the pressure for reductions in real incomes can then only be relieved by the migration of labour to the more prosperous regions.

Has the EMS Fulfilled its Goals?

Aside from its political significance, the principle economic goal of the EMS has been to provide a stable international monetary environment that would generate welfare improving macroeconomic benefits for member countries. Before the turbulence in the financial markets of recent months many authors had presented evidence that exchange rate fluctuations had been reduced (see for example OECD Economic Outlook, Dec. 1989). This held true both when the situations before and after the establishment of the EMS were compared, and when ERM countries were compared with a control group consisting of non ERM countries. Perhaps, however, the development of inflation represents the most significant example of convergence in economic indicators. In other fields such as real economic growth and unemployment levels, signs of convergence have been less clear (Mielsen et al 1991).

However, when looking at exchange rates it is important to look at real as well as at nominal movements. (The real exchange rate is the nominal exchange rate adjusted by the ratio of domestic and foreign price levels). For example a study by the CEPS Economic Policy Group (1991) found that the lira and peseta had appreciated significantly since the mid 1980s, in sharp contrast to the experiences of the two largest economies in the EMS, Germany and France and most of the

smaller northern European countries. It is argued that a major deterioration in competitiveness is observable in Italy throughout the period of EMS membership and in Spain since about 1985. They argue prophetically that, especially against the background of a deterioration of the current account and a decline in the export/GNP ratio in both countries, continued divergence in competitiveness inside the EMS can only lead to a point where the system becomes unsustainable.

However, the foregoing analysis has been overshadowed by the currency market turbulence of recent months. Of the ten currencies that were members of the ERM last September (Greece is not a member, and the Luxembourg franc is set at par with Belgium's) only five remain unscathed; sterling and the lira have left the system, and the peseta, the escudo and the punt have all been devalued. All fixed exchange rate regimes are vulnerable to external shocks - which is exactly what happened when Germany reunited. The Bundesbank has been unyielding in its response to the inflationary pressures generated by reunification. Consequently, German short term rates which set a floor for those in the rest of the EC are at historically high levels. Other countries must maintain higher real interest rates than their depressed economies need. This has generated considerable political tension, particularly as the option of devaluation has become less favourable since the late 1980s when the ERM was chosen as the appropriate vehicle for European union and the balance between flexibility and stability tipped decisively towards the latter. The spectacle of EC governments airing their criticisms of each other makes a mockery of the spirit of cooperation which the EMS ostensibly embodies.

Conclusion

Clearly in the light of recent events, the theory and reality of the EMS have diverged dramatically. The fact that true political and economic power still lies at the level of the nation state is illustrated by the unwillingness of governments to subordinate their economic policy making to the achievement of a transcendental "European" goal. Perhaps now we are experiencing the backlash of the many awkward questions pushed aside earlier.

Although the EMS rules were built on the principle of "reciprocity", the role of the German mark expresses the fact that in practice the EMS is dominated by an"asymmetry" with the burden of adjustment having been placed on the weaker economies. This is in sharp contrast to the original intentions of the EMS. Initially countries which did not wish to submit themselves to the discipline of the Bundesbank could either rely on capital controls by which the domestic money market would be partly shielded in respect of the mark, or else make use of periodic central exchange rate adjustments to maintain a certain autonomy in long run monetary development. Consequently the other nations in the E.M.S. have been obliged to acquiesce to the tight monetary policies pursued by the Bundesbank, ruling out, for example, the option of an easier monetary policy to reduce domestic unemployment.

If, as seems likely, the E.M.S.will stagger on, bloodied and bowed, the recent signs of a softening of its stance by the Bundesbank will be welcomed throughout the system. However, events of recent months do not augur well for the prospects of a European currency union within the timescale envisaged at Maastricht. Perhaps at a time when unemployment throughout the EC is approaching 20 million it is time for a radical rethink by E.M.S. member governments of the form monetary policy takes over the coming decade.

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THE DEBT BELL TOLLS AGAIN

by Catriona Purfield

On August 20th 1982, Citibank's Vice Chairperson, W.R.Rhodes cut short his summer vacation, with the announcement of Mexico's president, Lopez Portilla and his finance minister Jesus Siliva Herzog ringing in his ears. It was on this date that the Mexicans announced to the world that they would no longer be able to meet their debt service obligations. The shock to the world's financiers was a large one, but then again so was Mexico's foreign debt, (80 billion dollars to be precise,). The bulk of this debt was borne by American banks. In fact Americas nine largest banks were owed $12 billion, (roughly 40% of their capital reserves). In many cases the banks' exposure exceeded their capital giving rise to fears of a run on the system.

However more bad news was to follow. 26 countries were reported to be late on their debt repayments. Quick to follow the Mexican announcement were Argentina and Brazil. Many sub-Saharan countries were also in severe difficulties. The world braced itself for the sinking of the international financial system.

This was how the world debt crisis came to the fore of the world headlines. I hope to trace the trail of events in the crisis to the present by firstly presenting the package which helped save the Mexicans, and which was later formulated into a rescue package which was implemented in other debtor countries. I then intend to cover the origins or roots of the crisis in the 1970s. This analysis of the past will be followed by an evaluation of the present, showing how despite the apparent calm the crisis still exists in its most potent form for those in the sub-Saharan countries which are the poorest in the world. These countries are bearing the full brunt of the recommended IMF adjustment policies with little or no assistance from First World nations. In order to suggest ways of relieving the human suffering in these countries, a brief outline is given of possible policy instruments which could be implemented in both Third and First World nations.

THE INITIAL CRISIS AND ITS SOLUTION

The disaster did not happen to the financial system despite the fears of many. All parties to the debt problem worked to maintain the stability of the system. Jesus worked miracles in conjunction with the Americans (for it was they who after all had the most to loose financially). Credit was advanced to the Mexicans and advance payments were made by US authorities for shipments of Mexican crude oil. The IMF negotiated a loan of $4.8 billion and at a meeting with the commercial banks in New York, Herzog negotiated a 90 day moratorium on principal repayments for

public sector debt. Soon after, the Mexican survival plan was formulated into a world strategy in response to difficulties being experienced in various countries. There were three main stages.

a) DEFENCE: This consisted of the formulation of emergency short- term packages and the rescheduling of debt due within the next 2 years, in order to overcome short-term problems.

b) OFFENSIVE: The IMF entered the battle for the maintainence of the financial system. They negotiated stabilization policies in debtor states. Countries were advised to remove exchange and import controls, to devalue official exchange rates and to implement stringent anti inflationary policies such as cut backs in public sector spending and borrowing, and controlling wage increases. In return the commerical banks would agree to reschedule debt.

c) THE CONDITIONALITY TRUCE: The Baker Plan, by which commerical banks would make new loans available on the undertaking by debtor countries that they would implement certain growth-oriented structural reforms, was formulated. The abyss had passed..... or so it seemed.

ORIGINS OF THE CRISIS

Despite the rather abrupt emergence of the "debt-crisis" onto the world's headlines, the problems roots stem right back to the 1970s, with the occurrence of the world oil price shock.

In order to maintain their previously high growth rates many of the now present debtors sought loans from commercial banks. These private institutions were only too willing to lend in order to recycle their surpluses of petro-dollars which had been accumulated by the Arabs after the 1973 oil price hike. Often these loans were made without proper assessment of the project being funded or of the risk involved. Such commercial debt carried with it shorter maturity and more variable interest rates than what was available on official loans. A favourable economic climate from 1974-1979 meant that third world debtors had little difficulty in meeting their debt service obligations. The 1970s were a period of high inflation. Real interest rates were low or negative. Commodity prices were also high.

This bubble burst with the second oil price shock of 1979. Faced with high oil bills, large trade deficits and a global recession (resulting from the price stabilization policies of industrial nations), debtors saw real interest rates rise from a negative 3-6% to a positive 16-20% by 1982 (Kruger,1987). Primary product prices plummeted by around 20% (Todaro,1989). These external conditions were aggravated by the domestic mismangement of economies and the flight of private capital from these countries. In Mexico, the main cause of the debt crisis was a highly expansionary macroeconomic policy financed by external borrowing, $65 billion of which was at variable interest rates and capital flight (accounting for about

71% of Mexico's debt growth (Todaro, 1989)). Under such tremendous pressure, both internal and external, it is little surprise that Mexico, and many other Third World debtors could no longer meet their repayment deadlines.

THE SITUATION TODAY

It is now over ten years since the Mexicans broke onto the news headlines. These days media coverage on the subject has waned considerably. Where do we stand now?

Ten years later, there has been only a marginal improvement in the aggregated developing countries debt service ratios (DSR). It has fallen only one percentage point from 31.8% of the value of exports in 1983 to 30.8% in 1991 (IMF, 1991). This meagre improvement however, masks and is consistent with the claim that the situation is actually worse now and still remains unresolved. Nowhere is this more true than in sub-Saharan Africa (SSA), where, with a population of 464 million and a per capita income of only $330, the problem is particularly acute in human terms. After ten years of rather painful adjustment the DSR for the continent as a whole has risen from 22.7% in 1983 to 24.5% in 1992 (IMF, 1991). The adjustment has been largely borne by those who can least afford it, the poor, who constitute the vast bulk of the population of these nations.

External Debt Stock of Sub-Saharan Africa

Amount (US$millions) Share %

	1985		1990	
All Sub-Saharan Africa	**AMOUNT**	**SHARE**	**AMOUNT**	**SHARE**
Total external debt	98.7	100.0	173.7	100.0
Long-term	84.4	85.5	152.8	88.0
Official	52.8	53.8	112.0	64.5
Multilateral (inc. IMF)	23.4	23.7	43.5	25.0
Bilateral	29.5	29.9	68.5	39.4
Private	31.6	32.0	40.9	23.5
Short-term	14.3	14.5	20.9	12.0
0/w interest rates	1.9	1.9	10.5	6.0

Source: World Debt Tables 1991-92

This table illustrates the fact that despite the adjustments that have taken place under IMF guidance that the level of indebtness has actually risen in Sub-Saharan Africa (SSA).

SSA Debt Policies: Hardship and Failure

Three main approaches were taken in the 1980s to reduce the DSR.Domestic consumption was choked back, with cuts being made in public expenditure levels of these countries. These cutbacks in investment and expenditure have led to the reduction of aggregate supply and this has now necessitated an even more savage depression of domestic demand on an already poverty-stricken population. Secondly, governments have sought to reduce import demand, this intertemporal trade-off is an important contributor to the present detoriation of the DSR, since by cutting imports in the 1980s the potential export capacity of these nations in the 1990s has been restricted and so SSAs export performance has been adversely affected.

The final contributing factor to this dire human situation is that, unlike in the 1980s when they received positive transfers from the rest of the world, SSA is now giving substantial sums of money to the banks of industrialised nations in interest payments. Under mounting internal political pressures, these countries have nothing to lose by defaulting on their debt repayments. This is especially true now that it is common knowledge that the banks have now built up substantial reserves for protection against default. The brunt of the adjustment has already been borne by those who can least afford it,and with little if no improvement in the situation. This is why the situation is more serious now than ever before and needs immediate attention.

The Case for Relief

Debtor countries have paid the full price in terms of low GNP growth and falls in real wages in order to service the debt burden.The price for the mistakes of both the creditors and debtors have fallen firmly on the shoulders of the debtors countries. Given high negative transfers, default seems a feasible option. In order to prevent this and to draw the "debt crisis" finally to a close, a case for debt relief can be strongly advanced on distributional grounds. Yet the banking institutions and the IMF staunchly maintain that present debts should be honoured.

Why do they persist with such a policy? Basically, they cling to the hope of making capital gains in the event of borrowers paying in full. The world's poorest people are suffering in order to provide bank shareholders with the mere hope of a profit. Such a situation can hardly be justified on moral grounds.

The case for relief can even be advocated on strictly economic grounds alone. Bird (1982) postulates a debt relief Laffer Curve. Once debt exceeds a certain point then reductions will provide the necessary incentives for paying off the remaining sum outstanding. Once debt obligations are expected to be met the value

of the debt on the secondary market will rise, such relief would normalize the loans market once again. Fisher(1987) proposes that relief should only be available once IMF structured adjustment programmes have been agreed to. These would be growth-orientated and encourage investment both in private and in public sectors with the liberalisation of trade also occurring. Once this was in place, the princpal and interest would be reduced to 65% of their contractual value. Annual savings would vary between 1%-3.5% of GNP and would allow a substantial improvement in the welfare of the poor.

Conclusion

The debt crisis is still alive today in even a more potent form than it was in 1982. The "debt overhang" (Fisher's term) is preventing the progression of many countries particularly those in sub Saharan Africa. There has been a shift of the zone of danger across the sea from Latin America to the African continent. There has not, however, been the same media focus, which is needed to highlight the fact that the situation is now potentially more dangerous and of a different form than that which existed in Latin America ten years ago. The problem needs innovation and a new solution . This will require further research and attention.

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Foreign Direct Investment and the Dublin International Financial Services Centre

by Keith O'Brien

In 1987 Ireland launched itself as a location for international financial services with the development of an offshore centre: the Dublin International Financial Services Centre (IFSC). While conforming to some of the established methods for attracting foreign direct investment the IFSC initiative does differ from previous schemes. It emphasizes the gradual shift from manufacturing to services in the government's search for new sources of investment with the potential for creating competitive advantage. A new departure was the targeting of Irish owned firms to be part of a cluster of foreign and domestic enterprises, the intention being to create an internationally competitive centre with a number of market niches. A further change was to confine enterprises to a specific Dublin location.

It is proposed to examine the IFSC as a location for foreign direct investment (FDI) by way of the literature on international production and Multinational Enterprises (MNEs) produced by JH Dunning. International production may be defined as: "value-adding activity owned or controlled, and organised by a firm (or group of firms) outside its (or their) national boundaries." (Dunning p1 1988).

The Eclectic Paradigm of International Production

Dunning has attempted to develop a paradigm that explains the "why", "where", and "how" of international production. In 1976 Dunning introduced his "Eclectic Paradigm of International Production". His aim was to: "offer a holistic framework by which it was possible to identify and evaluate the significance of the factors influencing both the initial act of foreign production by enterprises and the growth of such production" (Dunning p41 1988). The Eclectic Paradigm explains international production in terms of three "advantages".

(1) Ownership advantages (O advantages): these are endowments that are specific to particular enterprises and confer advantages over those enterprises of another nationality. O advantages consist of tangible (e.g. preferential access to markets) and intangible assets (e.g. management skills) that are capable of generating a future income stream. Dunning believes that these advantages are essentially similar to the "competitive advantages" described in the work of business strategists such as Michael Porter. The issue facing firms possessing O advantages is how to

exploit them across national boundaries. The choice is whether to do so within their own organisations or to use the external method of resource allocation i.e. the market. Dunning propounds the view that firms are subject to a set of incentives to internalise their ownership advantages, it is these incentives which comprise the second element of the Eclectic Paradigm.

(2) Internalisation advantages (I advantages): these develop from a desire by firms to either protect against or to capitalise upon imperfections in the external mechanisms of resource allocation. These mechanisms consist of the market/price system and public authority fiat. Because of market failures and the distortions caused by government intervention, enterprises choose to replace the market mechanism in exploiting their O advantages. In other words, MNEs allocate resources via the extension of their own value-added chains rather than by selling the advantage or the right of use to third parties. The enterprise now possesses O advantages which in combination with I advantages suggests that the firm itself will employ these advantages through trade or foreign direct investment (FDI), rather than contractual exchanges such as licensing, technical assistance, franchising and so forth. The question is whether foreign equity investment will be chosen over exports; this choice depends upon the third and final element of the Eclectic Paradigm.

(3) Location Advantages (L advantages): these comprise endowments that are external to enterprises i.e. they are country-specific as opposed to firm-specific. Location-specific advantages are effectively the same as comparative advantages and include input prices, investment incentives and infrastructure provision. An enterprise will engage in foreign direct investment when such L advantages favour a foreign as opposed to a domestic production base.

Together these three sets of advantages embody the OLI configuration, the basis of the Eclectic Paradigm. The configuration purports to explain (in terms of advantages) the "why"(O advantages), the "how" (I advantages), and the "where" (L advantages) of international production (Dunning p30 1988).

The Eclectic Paradigm and the IFSC

The IFSC was developed conceptually as a location for international production. In 1993 the centre is a reality with in excess of 200 firms granted licenses to establish operations; over two thirds of the licensees are non-indigenous. Dublin's IFSC has became a successful site for FDI by financial services firms, it is worthwhile examining the centre using the OLI configuration.

(1) Ownership advantages: in financial institutions they should include the firm's capital, professional reputation and image, market knowledge, technology, specialist information and the expertise of their employees. Given that a sizeable proportion of IFSC licensees are well established financial services organisations with large international networks, it follows logically that they have certain firm-

specific endowments not easily replicated by rivals. The presence (and indeed success) of IFSC licensees such as Baring Brothers, Deutsche Bank, Daiwa Securities and Crédit Lyonnais in other major financial services centres should constitute prima facie evidence of O advantages within those institutions. This argument is also advanced by Dunning in his work with Norman (1982, 1987) with regard to the presence of American services companies in the UK, Belgium and France.

(2) Internalisation advantages: it has to be determined whether financial services firms internalise the market for their O advantages or resort to contractual mechanisms. The difficulties in licensing or selling the rights associated with O advantages are obvious: enforcement of quality of service, safeguarding of proprietary knowledge, the cost of supervision and maintenance of licensee's image etc.. Financial services MNEs are as one with other multinational services firms in their preference for complete ownership of their foreign affiliates. In other words, internalisation via the extension of value chains and control procedures is the preferred method for international financial services companies in utilising their O advantages. Virtually all the subsidiaries of non-indigenous firms operating in the IFSC are 100% owned by their parent companies; see The Finance Directory of the IFSC (O'Brien and Vaughan 1991). Therefore, the parent companies which have decided to locate activities in Dublin have chosen to internalise their O advantages.

(3) Location advantages: the last element in the configuration is the location of the firms value-adding activities. Unlike the previous two variables L advantages are country-specific and external to the firm. A nation attracts overseas industry on the basis of its country-specific advantages (CSAs). These advantages take two forms: artificial and natural. Artificial CSAs incorporate the taxation and investment incentives offered by Governments. Natural CSAs derive from more fundamental aspects of the economy such as availability of labour, infrastructure, and a benign cost environment. Therefore, we must search for these country-specific advantages which are responsible for establishing Ireland as a location for international financial services.

This question may be answered on the basis of an empirical survey carried out in 1991 (O'Brien ;1993); the chief executives of thirty overseas firms licensed to operate in the IFSC were interviewed. They identified and ranked the reasons for locating in the IFSC, using a weighting system eight factors emerged as particularly important. Figure 1 illustrates the principal determinants of location for foreign licensees in the IFSC.

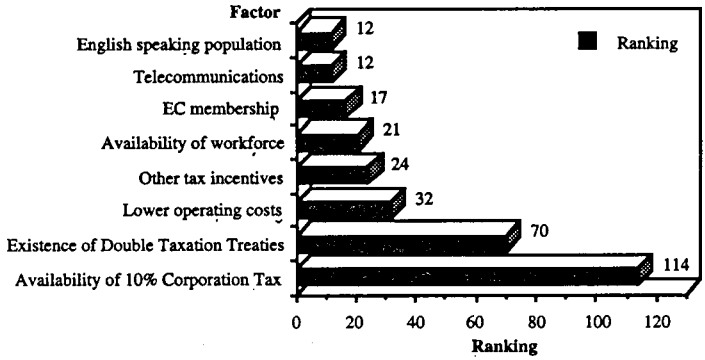

Figure 1 Determinants of IFSC location.

Ireland's main CSA is an artificial one; the 10% Corporation tax rate. Since the inception of industrial policies to attract non-indigenous enterprises in the late 1950s, MNEs have set up in Ireland on the foot of preferential taxes and government incentives (see McAlesse and Foley; 1991). In policy terms, the IFSC is a continuation of the Government's use of fiscal incentives to attract foreign direct investment. Indeed, the 10% incentive was necessary as all offshore centres, from Bermuda to Luxembourg, are based primarily on taxation concessions. Ireland's natural advantages, with the exception of lower costs, do not appear to be a major inducement.

According to the Eclectic Paradigm, Ireland as a locus for FDI can only hope to offer sufficient L advantages to attract and then maintain investment undertaken by MNEs. In relation to the IFSC, the authorities hope that having attracted overseas firms on the basis of artificial advantages, that in the period before the termination of the 10% rate in 2005, licensees will engage in organic growth linked to natural advantages. Jacobson and Andresso in a study of multinational investment observed: "The artificial country-specific advantages appear to be important in attracting insurance-finance-and-banking firms, though, in the longer term, firms in this type of industry - in which the product has an extremely high value-to-weight ratio, the skill content is essential - should be those most likely to be attracted by these natural country-specific advantages". (Jacobson and Andresso, p333-34; 1991).

Given the mobile nature of MNEs, the emphasis on FDI in industrial policy is inherently risky; Ireland's CSAs need to be constantly updated. Inward investment remains crucial for the development of a small open economy such as Ireland. In the absence of internationally competitive indigenous firms with the requisite activities and skills, the IFSC needed to bring in foreign firms to provide the

activities, expertise and market presence associated with an offshore centre. However, the IFSC also sought projects from Irish firms, who constitute the single largest source of projects. In the event of a mass withdrawal by non-indigenous firms - which is unlikely - Ireland would still maintain a core of Irish firms with the experience and market niches to provide the nucleus for a Dublin financial centre.

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EXCHANGE RATE POLICY IN IRELAND: PAST, PRESENT AND FUTURE

by Colin Meade

IN EXAMINING exchange rate policy in Ireland, I deal in this paper with inflation, and with its companion; competitiveness. The trends in inflation under different regimes are examined and the issue of devaluation as a means to improving competitiveness is tackled. In considering these issues much attention is paid to credibility and dependency on larger trading blocs. Future avenues for the punt are contemplated and the road to EMU firmly recommended.

PARITY WITH STERLING

The Irish pound, as we know it today, was first printed in 1928 on the basis of exchange rate parity with sterling. The existence of a one-for-one, no-margins parity, together with unrestricted capital (and labour) flows, made the sterling link an effective instance of monetary integration. Inflation levels were almost identical, Irish interest rates were very similar here to those in the UK, and control of the money supply was out of our Central Bank's hands as the unrestricted access to UK financial markets relegated Ireland to mere satellite status (McCarthy, 1980). We effectively had no exchange rate policy, beyond the decision to remain part of the sterling area; monetary policy too was impotent.

In the face of rising inflation in Britain in the 1970s Ireland's price level rose equivalently. Our commitment to sterling floundered as the EMS proposal was tabled. We now had the opportunity to do something pro-European (and anti-British) and break the inflation/depreciation spiral by attaching ourselves to the rock-solid Deutschmark. Furthermore sterling was believed to be a petro-currency with its fate determined by oil price movements, this having an adverse effect on an oil-importing economy such as Ireland (Dowling, 1979). Being tied to sterling in the face of the North Sea oil glut would have meant disaster for Ireland. Additionally, the break with sterling had appeal for economic nationalists, even though the move would add an economic dimension to the border with Northern Ireland. In any case were we not simply just switching ownership of our sovereignty from Britain to "Europe"? It seems the benefits were to outweigh the costs in Irish policymakers' minds as the decision was made to abandon the erratic pound and enlist in EMS in 1979.

The Switch to the ERM

Did the switch benefit our fight against inflation? A comparison in 1986 of the evolution of inflation since 1979 reveals no evidence that the decline in inflation rates proceeded faster inside rather than outside the EMS (De Grauwe, 1986). Furthermore the degree of exchange rate stability that has been achieved within the EMS has had little impact on macroeconomic performance. The growth of GNP has been slower, and the rise in unemployment faster within the EMS than in non-EMS countries during the 1980s. Even the supposed advantages for trade of membership may be doubted. The growth of intra-EMS trade has been slower than that between the EMS and the rest of the world or between non-EMS members.

The problem is that the EMS/ERM in its present form is only a quasi-fixed exchange rate system. So by moving from the sterling link to the EMS in 1979, Ireland was not substituting one fixed link for another. Short-run variations in the exchange rate are in fact, controlled by Central Banks, but are of a size to permit short-run variations in the interest rate and thus create exchange rate risk (Dowling 1986). Further, the possibility, and indeed necessity, of permanent adjustments in exchange rates leads to substantial divergences in long term interest rates. Sustaining a particular exchange rate in the Irish case is contingent on the markets' perception of that rate being compatible with sterling.

There is much debate over the importance of the UK market to Ireland. Current figures suggest that 32% of our trade is with Britain. There is the possibility that the real figure is much smaller, somewhere in the 15-20% region, as trade in agricultural and energy products is largely unaffected by sterling exchange rate movements (Sutherland, 1993). Nevertheless, the importance of the sterling/punt exchange rate exceeds the weight of sterling in our trade because several price sensitive sectors (textiles, furniture, clothing and footwear) are particularly influenced by sterling's value. The move to EMS has reduced our export dependency on the British market: it has come down from 90% in the 1920s, 48% in 1978, to approximately 32% today. Moving to EMU would reduce that figure still further but the markets must be convinced of this.

The Policy Implications of a Fixed Exchange Rate

To gain the credibility of markets a certain exchange rate must be backed by appropriate fiscal policies, both domestically and at an EC level. Firstly, the Irish government failed in their attempt to support the recent appreciation in the punt by cutting domestic input costs. PRSI should have been lowered for employers, but this was not done. Instead subsidies to industry were offered but these involved an open-ended exchequer commitment whilst merely postponing the adjustment to real exchange rates which must be accepted in the long run (Walsh, 1986). What the markets did see was a huge increase in public sector pay (which in Ireland arguably set wages for the internationally-competing traded sector too), quite the opposite

measure required in the face of a dear punt.

Leaving aside the crippling influence of interest rates, the old sterling rate could possibly have been endured until German interest rates fell, if the domestic cost base had been targeted sufficiently. It was not, and the loss of credibility drove interest rates unbearably high, forcing a devaluation, the worst possible outcome. Instead of an orderly realignment of the DM last summer (or before) having seen the inflationary impact of one-for-one currency union with Eastern Germany (a policy bitterly condemned by Karl Otto-Pohl, ex-president of the Bundesbank), the ERM plodded along. As cracks appeared, currencies were picked off by sheer weight of money, rather than on the basis of economic fundamentals. This cannot be permitted in the future and a reform of the ERM is required to ensure greater mutual support.

Devaluations: Costs and Benefits

Devaluation though, if properly managed, can provide some lasting benefit to a small open economy. The 8% devaluation of August 1986 created a sound platform for economic recovery, accompanied as it was by a temporary incomes policy and tight fiscal policy (McAleese, 1992). The key is pay restraint, involving a real fall in wages but not necessarily a nominal decrease. This is much quicker than allowing inflation to increase competitiveness by slowly eroding the purchasing power of the pay packet.

While the devaluation will have eroded credibility, damage can be limited by fiscal rectitude. Indeed, as in the recent Irish case, if the markets (rightly) view the sterling-punt exchange rate as untenable, then devaluation may be the only credible option? However fiscal tightness is crucial - "stabilisation through cuts in expenditure" - to avoid further calls for devaluation, and resultant higher interest rates. In an economy where the non-traded sector has managed to insulate itself increasingly from real income movements in the traded sector, devaluation is potentially a weapon to cut the real income of this non-traded sector (McCarthy 1982). However this reduction in real income must be permanent, not merely postponed as has been the case here currently with 10% pay increases for public servants. Additionally devaluation provides short term gains to the traded sector by boosting margins.

I am not going so far as to advocate 'escapist' devaluations. While they may be periodically needed, they create the need for risk premiums on interest rates, increase inflationary pressures and damage competitiveness (Sutherland, 1993). Rather the way forward is to link ourselves to a larger trading bloc. While some may argue that a greater readiness to devalue is required (Walsh 1988), long run benefits require a fixed link. But with whom?

Future Options for Exchange Rate Policy

We are currently apparently adopting a trade weighted approach to exchange rate policy, an attempt to reconcile a depreciating sterling with our commitments to the ERM. But this is not sustainable due to speculation and higher interest rates. We must either pursue a sterling link or a much strengthened ECU link. The former would leave us open to sterling's cyclical weaknesses/fluctuations.

However an ECU link, would be just like the old sterling link (Dowling, 1986). While this would mean surrendering all control of monetary policy to a (hopefully) independent central bank, there is doubt as to whether or not we would have any control under flexible exchange rates either. Ueda (1984) argues that a SOE is forced to tighten their own monetary policy if a large country, upon which it is highly dependent for imported intermediate goods, tightens its monetary policy. This is effected through supply-side influence on price and output stability. In any case a SOE has little leeway in a world where it is a price taker and where the world interest rate is taken as given.

Given the current composition of Irish trade the ECU link would be closer to a trade-weighted exchange rate policy than a sterling link would be(Dowling,1986).

Conclusion

I believe that an ECU link is the way forward. Unfortunately this must involve our single most important trading partner, the UK. Until we have further diversified from our UK trade links, we will not be able to participate in EMU without them.

The EMS has been in trouble before and will be so again. Ireland should be a firm advocate of monetary union, and indeed will be, seeing as we expect to receive from Brussels six times the amount we'll hand over, for 'cohesion' (The Economist 13.06.92). Ireland has much to gain from EMU, despite the dessenting comments from Feldstein (The Economist 13.06.92) who argues that a common currency may actually damage trade. His comments pertain mainly to large economies though, and are largely irrelevant to Ireland.

Looking tentatively to the future then, pressure on the punt will ease as sterling strengthens in the event of recovery and a rising price level. A two speed Europe may now be the only way ahead, and if so, Germany, France and the Benelux countries should form a monetary union as soon as is economically possible. Whether or not Ireland should be part of that 'fast lane' is another issue, for another day.

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Issues Associated with Public Expenditure as a Mechanism for Government Intervention

by Cloda Lane

Throughout the world governments are intervening in their economies. Adam Smith's "invisible hand" is not sufficient as a regulatory mechanism so in this essay I am going to take as given that government intervention, because of the existence of externalities, public goods and imperfect information, is acceptable in principle. What I intend to investigate is what the optimal level of public expenditure, the most frequently used tool of intervention, is and what are the factors which cause it to deviate from this amount.

An Optimal Expenditure Level

In order to have an optimal level of expenditure the government must satisfy the condition that the marginal benefit of expenditure is equal to its marginal cost. A form of cost benefit analysis must be carried out on all existing and proposed expenditure plans to determine whether they meet this criteria. Benefits of expenditure tend to be clearly visible. The benefits from a new motorway, a new school or a new hospital can be quite easily evaluated. However, benefits of expenditure are often shortlived, so there must be continuous scrutiny of the services to see if they are still relevant to public needs. This will cut back on much of the annual increments that are paid to unneeded existing services. When measuring benefits we should also be aware that different forms of expenditure have different effects on economic growth. As Barro (1990) emphasises, public investment expenditure tends to be advantageous for growth but public consumption expenditure is not. This argument is verified by Barth and Bradley (1987) who found a negative relationship between the growth rate of real GDP and the share of government consumption for 16 OECD countries between 1971 and 1983. When choosing between expenditure proposals, therefore, the government would be better able to influence economic growth with investment rather than consumption plans.

The marginal cost of expenditure is more difficult to evaluate because it includes the actual real costs of financing the expenditure and the external or social costs of that expenditure. Obviously, any expenditure proposal that needs large levels of financing should have very definite and substantial benefits attached to it. As Honohan and Irvine (1987) propose "a spending proposal must have a social benefit large enough to cover not only the cash costs, but also the deadweight loss resulting from the taxation that will be needed" in order to finance it. The external

costs of expenditure programmes on the private sector must also be considered. The evidence from Bacon and Eltis (1978) research shows that periods of expansion in the public sector have put pressure on the amount of resources available for other uses. It must be clear that the resources used could not have been utilised in a more efficient way. Calculations of marginal cost should take into account the loss of private expenditure on consumption and investment that arise because of the resources needed for expenditure proposals. When trying to decide whether or not to undertake a particular plan the government must follow the guideline of the Public Capital Programme (1984) that "public investment will not be undertaken unless it can be clearly shown on realistic assumptions that it will yield a sufficient return". To optimise overall public expenditure the government must be sure that the aggregate marginal benefit from all levels of expenditure is equal to the marginal cost of the expenditure.

Deviation from the Optimal Level

Unfortunately, it is very difficult for the government to actually reach this optimal position. First of all, it is difficult (and sometimes costly) to carry out all the calculations necessary to measure the marginal benefit and cost of expenditure, and secondly there are rigidities in the system which continuously cause expenditure to deviate from its optimal level. These rigidities are caused by technical and political factors and they make public expenditure an inflexible, and therefore inadequate, means of government intervention.

Technical factors explain the determination of the level of public expenditure by regarding it, perhaps unjustifiably, as being independent of the government's ideology. There are four main technical factors that influence the size of the public sector share, and thus influence how extensive government intervention in the economy is. Firstly, public sector expenditure increases when there is increased demand from the electorate for public services, most notably health and education. In Ireland in the 1970s the increased demand was due to a general higher level of wealth among voters and a "demonstration effect" from other countries. The second factor that can explain high levels of public expenditure is that, over time, the costs of public services rise faster than the costs of other goods and services but, because of Baumol's disease, the increased costs are not matched by increased productivity. Huge increases in public sector recruitment in the 1970s and 1980s are now having a detrimental impact on government expenditure. Strong unions have been able to demand large increases in wages for a large number of people. This demand-led expenditure, epitomised by the PESP agreement, reduces the flexibility of the government in managing public expenditure today and in the future.

The third, and perhaps most fundamental, technical factor determining public sector expenditure are demographic changes. As the birth rate slows down and the population gets older there will be increased expenditure in the form of pension payments. At the same time, however, there should be decreased expendi-

ture on education, as the proportion of the young population decreases. Overall, if the effect is balanced, there may be no need for any dramatic change in government expenditure levels. The problem facing government expenditure plans now is how to provide unemployment benefit to 300,000 people. The high unemployment level in Ireland severely restricts any government attempts to decrease expenditure as the increasing numbers of people "signing on" all have to be provided for. A secondary effect is that the increases in unemployment leads to a decrease in GDP. This means that the overall level of the public sector share increases two-fold. As benefit levels can't be reduced, because they have to be within EC limits, the only way that the government will be able to reduce the public sector share is if there is economic growth.

The final, but by no means most insignificant, technical factor that determines the level of public sector expenditure is past borrowing. The government today can not control this part of public expenditure. The financing of public expenditure through borrowing in one period will lead to increased public expenditure in the future. Debt interest payments make up about 10% of public sector expenditure. As well as being dependent on the activities of past governments, the size of debt service obligations are influenced to a significant extent by the interest rate and by exchange rate movements which are largely outside the direct control of the government. The relevance of this and the other technical rigidities are clearly evident in the Irish economy but they by no means explain fully the divergence from the optimal expenditure level.

Political factors also cause public expenditure to deviate from its optimal level. The arguments surrounding these factors are based on the claim that public expenditure decisions are the outcome of a complex decision-making process involving the electorate, the bureaucracy and politicians. Fiscal illusion is the factor that causes the electorate to influence expenditure levels. Benefits of expenditure are visible and are directly related to specific groups but the costs are spread over the whole electorate and are often hidden. The electorate, therefore, demands increased public expenditure on the misperception that the benefits of it are greater than the costs. While this phenomenon was evident in the early 1980s it is not as widespread in Ireland in the 1990s. The electorate has learnt, from the past decade, that there are high costs attached to the financing of public expenditure and they are now more reluctant to push for increased public sector expenditure. The present absence of fiscal illusion can best be explained by two facts. First of all, people are now painfully aware that debts have to be repaid with interest. Secondly, the existence of "fiscal drag", which explained why some people did not perceive the true costs of public expenditure in the past, is no longer a major problem in Ireland because our inflation rate is low and relatively stable.

Another political argument which, in my opinion, does not have much relevance for Ireland today, is that the efforts of public servants to increase their own "empires" influences the level of public sector expenditure. This argument claims

that the civil servants, whose main objective is to protect their own jobs, possess enough information and power to control the expenditure decisions of the government. Since 1987, government departments have lost any such untrammelled power they once had. The introduction of the Expenditure Review Committee in the public sector has taken power away from the civil servants who may have wanted to push expenditure up and given it to those who are trying to control expenditure levels. Civil servants now have to justify all expenditure proposals. So theories of them being able to push expenditure in Ireland upwards are now unsubstantiated .

The final political factor that influences the level of public expenditure is the type of government that exists. The key problem with government intervention is that the politicians always take a short-term view of the economy. Getting re-elected is a priority and expenditure decisions tend to revolve around four year tenure periods. Only in a system where the government is guaranteed a long-term existence will there be long-term plans for the economy. Barro (1990) has emphasised this fact that government policies often deviate from optimal policies because government cannot commit itself to future action.

In the Ireland of 1993 a discussion about the influence of type of government on public expenditure would not be complete without reference to the relationship between coalition governments and public sector share. Many arguments have claimed that short-term policies and high expenditure levels are prevalent amongst coalition governments. The argument claims that lack of cohesion and a belief that the government could not be anything but temporary, leads to a haphazard treatment of public expenditure plans. There is often a "prisoner's dilemma" problem amongst coalition partners with regard to cutting public expenditure: both parties may favour cuts but each partner wants to protect its particular part of the budget against such an action. In the absence of any agreement the noncooperative solution would be to have no decrease in expenditure. The problems with reaching such an agreement would only be increased by multi-party ("Rainbow") coalitions and alternating ("Rotating") leadership. There is no substantial proof in Ireland, as yet, that coalition governments are more prone to increase public expenditure than single party governments. The existence in the Programme for a Partnership Government (1993) of a number of expenditure items, without substantial reference as to how they are going to be financed, may be a warning sign of things to come however.

CONCLUSION: EXPENDITURE EXPERIENCES

All of these technical and political factors show that the level of government expenditure is often forced to deviate from its optimal level. It is political judgement and technical commitments rather than economic calculations which influence public expenditure levels over time. In the 1970s there was worldwide consensus that high levels of public expenditure were desirable. The 1980s, and the rise of the New Right, enlightened the world to the dangers of increased growth in the public sector and there was a general effort to "roll back the state" by cutting public expenditure. What will happen in the 1990s is uncertain. Public sector share has been on the increase yet again since 1990. It has gone from 36.8% in 1990 to 38.5% in 1992. Expenditure will probably also be high in 1993 with the move into the E.C. internal market and the currency crisis having to be paid for. What should be avoided for the 1990s, however, is any large increase in public sector expenditure and especially in any form of long-term expenditure commitments. While the Western world is trying to stabilise this more acceptable level of public sector share the recently "liberated" eastern bloc countries are just starting to discover how valuable government expenditure can be for the economy. Fortunately, most of these countries, notably Poland, Czechoslovakia and Hungary, have learnt from the mistakes of the West. They are reluctant to run up large deficits in order to increase their recovery programmes and are determined to take a more long-term approach to improving their economies. They have come to realise, like the Western world, that public expenditure is not always the best intervention tool if technical and political factors are allowed to cause it to deviate in a large way from its optimal level.

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THE DISTORTIONARY IMPACT OF TAXATION ON IRISH SAVINGS MEDIA: THE PRINCIPLE OF FISCAL PRIVILEGE

by Pamela Warrington

FISCAL PRIVILEGE relates to the differential tax treatment of different assets or forms of saving. What this essay purports to do is to give an overview of how the degree of fiscal privilege is calculated for various assets across different categories of savers, and to show that the system of taxation currently in practice in Ireland has distortionary effects on the choices that savers make. The effect of inflation will also be highlighted.

FISCAL PRIVILEGE

Fiscal privilege is the term used to explain the differential tax treatment of different assets or forms of saving. Consider an individual who wishes to save a fixed amount on a yearly basis. There are a range of savings media open to her and we expect her choice to be based primarily on considerations such as her liquidity requirements, savings objectives (long run(LR) or short run(LR)) and her degree of risk aversion. However, the tax system is another influential factor, since tax efficiency varies widely between the alternative savings media. Different institutions carry different reliefs and are subject to diverse tax treatment. For example, contributions to pension funds offer savers relief against personal income tax, while deposits with financial institutions are subject to DIRT. What we are concerned with is an investigation of the extent to which the tax system favours or penalises different savings media, ie. the Degree of Fiscal Privilege (DFP) attached to each asset, and how this distorts the savings decision.

Such an analysis requires a comparison of the tax treatment of different assets or methods of saving. This will highlight the violation of the principle of horizontal neutrality which says that for a given tax-payer, the DFP must be the same for all assets. Furthermore, the tax system also violates the principle of vertical neutrality, which implies that the tax penalty/subsidy attached to different assets is not constant across groups of savers paying different rates of income tax. Thus we investigate the DFP of assets across two classes of savers.

Capitalisation Effects

Capitalisation refers to the process whereby the reliefs and exemptions which are firmly fixed in the tax system become incorporated into the price structure of the associated assets. Full capitalisation infers that prices have adjusted to reflect perfectly the effects of these reliefs and exemptions. If prices only adjust to a certain extent, then we say that partial capitalisation has occured. The existence of capitalisation effects implies that the removal of the reliefs and exemptions may impose significant costs on large sections of the population.

Consider the following two examples, which are frequently cited as illustrations of capitalisation effects:

a) If mortgage interest relief is introduced, then house prices will adjust to reflect this as the new information is absorbed and incorporated into the price mechanism. It can be easily recognised that the principal beneficiaries are those who owned houses already at the time the relief was introduced. Subsequent house-buyers will face house prices and mortgages that have been calculated taking the effect of the relief into account. In other words, the mortgage interest relief becomes capitalised into house prices and therefore the size of mortgages. The abolition of mortgage interest relief would therefore result in a drop in the value of houses; home-owners would suffer a reduction in the value of their houses as well as a lower post-tax income. Note, however, that supply side responses must also be taken into consideration. The greater the response of supply, the lower the degree of capitalisation in prices. For example, higher prices resulting from the introduction of tax concessions will lead to new construction, which moderates the LR impact on prices. Likewise, the SR impact on prices of a withdrawal of a tax concession is likely to be more severe than the LR impact.

b) Consider two deposits, A and B, which exhibit identical risk and liquidity characteristics. Assume that A is a deposit with a bank and B is a deposit with a building society, and that the tax laws are such that interest payments on deposits with both institutions are subject to tax at 35%. Hence if both A and B yield pre-tax nominal returns of 10%, post-tax returns to both will be 6.5%. Now, assume that the tax laws change so that deposits with building societies are now subject to tax at 30%. The post-tax return to B will now be 7%. A reallocation of existing portfolios will occur until the pre-tax return to B falls to 9.28%, fully capitalising the effects of the fall in taxes and restoring the post-tax return to 6.5%.

Hence the allocation of new savings is unaffected by the changed tax code. Note, however, that overall asset B now commands a greater proportion of the economy's savings, hence there are potential efficiency implications associated with the differential tax treatment of savings even if full capitalisation occurs. For the purposes of this essay I assume that we are dealing with an imperfect market in which only partial capitalisation takes place.

METHODOLOGY

Hills (1984) defines the DFP as simply "the difference between the owner's marginal income tax rate and the effective tax rate on the asset's real return", where the effective tax rate (ETR) measures the proportion of an asset's real pre-tax return paid in tax. The ETR practically always diverges from the tax-payers marginal income tax rate. The first stage in calculating the DFP is thus to work out the effective tax rate. This is done according to the following equation

$$ETR = \frac{(r - R)}{r^*}$$

where r = the asset's nominal pre-tax return
R = (1 - t)r = the asset's nominal post-tax return, t being the relevant tax rate
r* = r - inflation = the asset's real pre-tax return.

Note: The numerator terms can either both be expressed in real terms, or both in nominal terms. We choose nominal purely for reasons of computational simplicity.

Once we find the ETR we can get the DFP by subtracting the ETR from the individual's marginal tax rate, MTR.

Thus : DFP = MTR - ETR

When v = marginal tax rate, then

$$DFP = v - \frac{[r-(1-t)\,r]}{r - \text{inflation}}$$

$$DFP = \frac{vr - v.\text{inf.} - (r - r + rt)}{r - \text{inflation}}$$

$$= \frac{vr - v.\text{inf.} - rt}{r^*}$$

If the DFP is positive, then the asset is treated favourably by the tax system. If it is negative, then the asset is penalised by the tax system.

Discrepancies in real pre-tax returns across different savings media will of course play a part in influencing savers' decisions, hence in analysing in isolation the effects of the tax system on the allocation of personal savings a single pre-tax return is assumed for all assets. Calculations are thus based on the tax which would

have been levied if the different assets had all yielded an identical pre-tax real return. As such, then, the results below represent hypothetical relative performances as opposed to actual performance measures. Below I outline the calculation of DFP across three categories of assets:

(1) DEPOSITS

These calculations relate to interest-bearing deposits liable to DIRT.

Firstly we assume DIRT @ 27% with no additional tax liability for higher rate payers. In this case the formula for calculating ETR is given by:

$$ETR = f(r - (1-t)r, r - inflation)$$

Secondly we assume that higher rate tax-payers have additional liability at the difference between their marginal tax rate and the DIRT rate, so ETR is now given by the following formula:

$$ETR = f(r - (1 - t - d)r, r - inflation)$$

We finally assume that DIRT is charged at the reduced rate of 10% with no additional liability to either class of tax-payer.

(2) GILTS

The next group of assets we look at are 10 year gilts. The total return to gilts can be split into 2 components, viz. an interest payment and a capital gain/loss. The tax system dictates that the former be charged to tax at the owner's MTR and that the latter are tax free. The implication of this is that it benefits individuals to buy gilts with low coupons, ie. whose return is primarily in the form of capital gains. Following Hills' methodology, gilt prices are approximated by :

$$P = f(c,r) + [f(1-f(c,r), (1+r)^N)]$$

where c is the coupon and N denotes years to redemption. He therefore defines taxable yield as $r_G = f(c,p)$

and calculates ETR as :

$$ETR = [f(r_G - (1 - t)r_G, R)]$$

Thus $$DFP = v - f(t.r_G, R)$$

(3) COMPANY SHARES

The final group of assets we examine are company shares.

Letting r = pre-tax profits

b = the proportion of profits retained by the company

c = the rate of corporation tax

v = the share-holder's MTR

t = the tax credit

we can see that :

Profits available for distribution = (1 - c)r

Profits distributed = (1 - b)(1 - c)r

Corporation tax on undistributed profits = bcr

Corporation tax on distributed profits = (1 - b)cr

Income tax on distributed profits = (1 - b)(1 - c)(v - t(1 - v))r

As the sum of the last three items gives total tax paid, the effective tax rate on gross profits is :

$$ETR = (1 - b)(1 - c)(v - t(1 - v)) + c$$

Following this procedure, and assuming a real rate of return of 4% across all assets and inflation rate of 3%, Rodney Thom produced the following table of results:

			Marginal Tax Rate		
			27%		48%
ASSET		**ETR**	**DFP**	**ETR**	**DFP**
Deposits:					
(1) DIRT = 27%		47	-20	47	1
(2) DIRT = 27%		47	-20	84	-36
(3) DIRT = 10%		17	10	17	31
Gilts : 10 Years					
(4) 3% Coupon		28	-1	50	-2
(5) 6% Coupon		43	-16	77	-29
Shares:					
(6) CT = 40%	RP = 30%	41	-14	53	-5
(7) CT = 40%	RP = 70%	40	-13	45	3
(8) CT = 10%	RP = 30%	24	3	38	10
(9) CT = 10%	RP = 70%	16	11	22	26

THE ROLE OF INFLATION

There are two explanations for differences in DFP. Firstly, the tax system may have explicitly designed variations in the treatment of different assets in order to encourage certain forms of saving, eg. pension funds contributions are tax exempt to encourage this method of saving.

Secondly, variations in DFP also result from the definition of income applied by the tax authorities. While economists focus on real income, ie. income net of the effects of inflation, the tax authorities do not adjust nominal income for inflation. That is, if i = 7% and p = 3% , economists define income as 4% whereas the tax authorities consider the whole 7% as taxable income.

As can be seen from the formula for DFP, the rate of inflation has a significant impact on the DFP attached to assets. When nominal interest rates increase to compensate for rising inflation, the tax authorities refuse to acknowledge this and instead treat the increase in return as an increase in real income. Hence the DFP is inversely related to the inflation rate. The general effect of inflation is to increase the dispersion of fiscal privilege across the alternative forms of saving. It should be noted, however, that inflation also changes the relative position of different assets. For example, calculating the DFP of deposits and gilts at 3 different rates of inflation yields the following results:

		DFP(%)		
Asset:		0%	2%	5%
Deposits:				
MTR = 27%		0	-14	-34
MTR = 48%		21	8	-13
(assuming no extra charge for higher rate payers)				
Gilts(3% coupon)				
MTR = 27%		5	1	-6
MTR = 48%		9	2	-11

IMPLICATIONS

The above analysis has shown that in Ireland the tax treatment varies considerably across the different forms of saving. The principles of neutrality and equity, both horizontal and vertical, are violated. Yet the reasons for fiscal discrimination and the principles underlying the privileges and penalties applied to certain forms of saving are unclear and indeed, (as Hills also argues about the UK tax system), often appear accidental rather than the result of conscious fiscal policy. Examination of our tax system reveals a distinct lack of economic logic behind numerous tax laws. The result has been the emergence of a sheltered sector that tends to favour the wealthy/higher rate tax-payers who can afford such things as VHI and

pension fund contributions. The fact that those individuals paying higher rates of income tax receive a disproportionate advantage indicates that the current system is regressive, and highlights the need for reform.

A Framework for Reform

The suggestion for reform given by Thom and Hills is that rather than continuing to make ad hoc changes, savings should be divided into 2 parts, viz. a privileged sector and an unprivileged sector. The former would comprise those forms of saving which the government sought actively to encourage. The principle of horizontal neutrality would be applied rigourously, so that within the sector, all forms of saving would be taxed in the same manner, leading to a DFP equal to the tax exemption.

Within the unprivileged sector, the aim would be to get away from the present system of taxing nominal returns and to introduce a system whereby only real returns would be taxed, bringing the DFP to zero. There are obviously a number of constraints and problems with this suggestion. For a start, one would of course expect the former sector to dominate, and this raises the issue of the possibility of cash flow problems for the government. To avoid this situation arising, limits would have to be set on access to privileged saving. Secondly, the achievement of a zero DFP as aimed for in the unprivileged sector is highly improbable.

Conclusion

However, from the individual saver's point of view, such a system would clarify things considerably. At present, the variation in tax efficiency of different forms of saving distorts savers' decisions, being at least as important as nominal pre-tax returns. Furthermore, it is imperative that the effect of inflation on returns be given recognition. The current tax system encourages savers to save via media which show the highest DFP rather than the highest nominal pre-tax return, and to favour assets which yield returns in the form of capital gain rather than interest income. While the above proposals for reform may be too ambitious, they at least highlight the main problems in our tax system today, and emphasize the necessity for re-evaluation and change. Calculations of the DFP highlight the extent to which the current system violates the principles of neutrality and equity, and I concluded that such violations have distortionary effects on the decisions that savers will make. Finally, some proposals for reform were discussed. In conclusion, then, even a cursory overview of the tax system as given here clearly leads to a recommendation for reform of the system of differential tax treatment of savings in Ireland.

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A Study of Trade Between Two Irish Economies

by Claire Treacy

Introduction

The opening of the twentieth century saw Ireland as a small open economy heavily dependent on export markets, particularly that of Britain. Rapid political developments produced two small open economies within a mere twenty-five years, one, Northern Ireland, considerably smaller in size, (though not in terms of its industrial base), the other, the Republic of Ireland, now politically independent but still economically dependent on Britain. In this essay I propose to examine the real gross exports from the Republic of Ireland to Northern Ireland since partition. From this I intend to build a picture of the economic integration of the two Irish economies and examine the influences of this integration. A brief outline of both economies is deemed helpful.

Although technically, Northern Ireland is now just another export region of the U.K. for the Republic, a surprisingly high proportion of the Republic's exports are sold on the Northern Ireland market. Contiguity and a history of fully integrated trade are manifestly important factors. Indeed, for manufacturers in Dublin, markets in Northern Ireland are geographically more accessible than markets in the South and West of the Republic, and historically they most certainly have been so.

Despite this apparent entwining of the two economies, their patterns of production, both industrial and agricultural are divergent to the extent that they are not notably interdependent. At the time of partition the Republic was principally involved on agricultural production while Northern Ireland focussed on industrial output. However, the specialized nature of Northern Irish industry required a global market, thus causing it to overlook its small neighbour. This meant that the Republic of Ireland was almost always a net exporter to Northern Ireland.

I intend to examine the details of the Republic's relationship with Northern Ireland over the past sixty-five years, breaking my analysis into two broad sections. To give an overall picture of what has happened between the two economies. I will examine the changes in real exports from the Republic between 1924 and 1990. A more in depth study of the period from 1979 to 1991 will follow, exploring in particular the contributory roles of the sterling/punt exchange rate and the 'security situation', two factors which I regard as salient.

A Historical View of Exports to Northern Ireland

On the first of January 1924, what previously would have been seen as inter-regional trade formally became international trade when the Republic of Ireland commenced exports to Northern Ireland. What took place over the following sixty-five years ran the gamut from out and out protectionism, all the way to the establishment of a complete free trade area. The two countries traded under fixed exchange rate system with resultant equivalent inflation rates until 1979, when the Republic of Ireland, although retaining strong ties with Northern Ireland, broke away from the sterling area to link with the ERM. All of these events are reflected clearly in the real exports index, one of the most remarkable features being that for just over forty years after partition the value of real exports did not increase significantly. Over the next few paragraphs I will highlight and try to explain the most striking points of the changes in real exports, from the Republic of Ireland to Northern Ireland over the broad time span of 1924-1990, before focussing on real exports from 1979 to 1991.

The first trade figures of the new Republic of Ireland date from 1924. Previous to that Ireland had been in commercial union with Britain since 1825. The immediate effect was a downturn in real exports to Northern Ireland. The 'agriculture first' policy in the Republic required free trade, so the imposition of tariffs along the new border was not a factor. Rather the border itself created the blockage, as Kennedy, Giblin and McHugh explain, "Prior to partition ... Belfast was a major port for the exports of goods from all over Ireland. Due to the political and sectarian tensions following partition, this trade was severely curtailed and many areas on both sides of the border were also cut off from their natural hinterland."

Following this uncertain transition period, the coming to power of Fianna Fail in 1932 with their belief in the self-sufficiency of the Republic earmarked the thirties as "..the years of the introduction of all-round protection, the promotion of the home market and the economic war." The so-called 'economic war' of the thirties between the U.K. and the Republic over DeValera's refusal to continue to repay loans of money given in pre-independance land acts continued to rage with a clearly detrimental effect on the Republic's real exports to Northern Ireland, until the far reaching Anglo-Irish trade agreement of 1938, which restored Anglo-Irish trade relations to normal. While this slightly overstates the situation, by the end of 1938 trade had begun to pick up and the value of real exports had passed it's nadir.

The Second World War was a period of depression in the Republic, but entering the fifties trade began to improve and continued to do so into the sixties. At this time government policy was to try to achieve growth through exports and foreign investment. Although the most widely quoted example of this movement towards free trade is the joining of the General Agreement on Trade and Tariffs (G.A.T.T.) in 1967, of greater relevance to real exports to Northern Ireland was the final removal of the tariffs imposed in the thirties by the formation of the Anglo-Irish

Free Trade Agreement Area (A.I.F.T.A.) in 1965. This is a clearly defined turning point in terms of real exports to Northern Ireland, with the value rapidly increasing from that time up to 1978.

Since then the picture has become somewhat clouded by the break with sterling. In fact Prof. McAleese in a comparative study of the two Irish economies cited the former parity between the Irish pound and the pound sterling as an advantage as "..we have no problems arising from the differences in, or changes of, the nominal exchange." Unfortunately, any more recent study of the two economies has no such luxury and the clarity of the two Irish economies cited with which events previous to 1979 were exaimed with is lost. The real exports to Northern Ireland from 1979 onwards will be studied in more detail in the following section, but what is clear at first glance is that what was previously a relatively smooth curve becomes turbulent and unpredictable. It is the aim of the next section to find some explanations for this.

A Closer Look at Influences on Trade (1979-91)

In my experience there is a widespread belief that the exchange rate between the Irish pound and the pound sterling is of great importance to every day interaction between Northern Ireland and the Republic. For anyone living in a border town it is a barometer of the extent of business the commercial outlets can expect. However, economic theory predicts that freely floating exchange rates would automatically adjust to gradual changes in demand, implying that the phenomenon of border towns should be a temporary one, the reality, as any Newry shop holder knows, is different. This may be explained by the fact that the Irish pound cannot appreciate or depreciate against sterling freely, being fixed as it is within the ERM. Sterling can move freely against the Irish pound, but then, would changes in demand for Irish exports have a significant impact on it? It was this line of reasoning which led me to believe that the exchange rate between sterling and punt may not just be a buoy rising and falling in the tides of demand and comparative advantage, but may act as a sluice, inhibiting trade by creating a false comparative advantage in one of the two economies.

Dramatically, this issue came to my attention when sterling dropped out of the ERM in autumn of 1992 and devalued rapidly. The devaluation most certainly affected Northern Irish residents studying in the Republic, and I was curious to see the extent of the impact in general. Unfortunately such data was not available in time for the completion of this study and so I was confined to the period 1979 to 1991.

After regressing the real exchange rate against real exports my results showed that economic theory appeared to prevail over popular belief. All the significance tests indicated that there was no notable linear relationship between real exports from the Republic of Ireland and the sterling-punt exchange rate. An economic explanation of trade between the two Irish economies may therefore, rest

in the economic theory books, comparative advantage and barriers to entry commonly being seen as the two most important factors.

However, in the context of Northern Ireland and the Republic there is a further dimension unaccounted for in economic text-books yet already featured in this study, namely the "political and sectarian tensions" referred to by Kennedy, Giblin and McHugh, or the "security situation" as it is euphemistically referred to in the Chief Constable of the Police Authority of Northern Ireland's Annual Reports. This has frequently been cited as the cause of the decline of the economy of Northern Ireland, (i.e. as few firms wish to invest money in an area in which their premises or outlet may be blown up at any time.)

If this was truly the case, then the number of explosions and incendiary devices would be expected to influence the amount of real exports from the republic into Northern Ireland. In this case my regression showed that this most emphatically is not true. Whether this would be true for all imports into Northern Ireland, is difficult to say. It is possible that the proximity of the two economies gives the Republic a more pragmatic view of the Northern Irish security situation and thus renders real exports impervious to the effects for terrorism.

Conclusion

The Republic of Ireland and Northern Ireland are both small open economies and as such are economically dependent on their trading partners. At one time they formed part of the same economy and, if Jacques Delors is to be believed, they will soon be part of a single economy again. Over the past twenty-five years the Republic has begun to export extensively to Northern Ireland, reflecting the abolition of various barriers to entry and the increasing trade consciousness of the Republic's government.

The punt's break from sterling in 1979 restricted the period over which I could carry out my study. This difficulty was exacerbated by the paucity of data on terrorist activity over anything but an annual scale. As a result, I contend that my results may not be entirely conclusive. The unstable international conditions existing in the later half of 1992 and into 1993, however are bound to have a detrimental effect on the Republic of Ireland's real exports in general and real exports to Northern Ireland in particular. It is also possible that a more dynamic model examining rate of change of the exchange rate in relation to real exports may provide a more significant result. That terrorist activity appears to have no detrimental effect on trade is heartening, but may, as previously explained, be an inaccurate reflection of the overall trade pattern with Northern Ireland.

The aim of this study has been to explain the fluctuations in trade and it leads me to conclude that whatever is causing variations in the extent of real exports

leaving the Republic for Northern Ireland, it is not the 'security situation' as exemplified by the number of explosions and incendiaries in Northern Ireland nor is it the exchange rate between sterling and punt. What is clear from the earlier part of the study is that the existence of barriers to trade, particularly in the form of tariffs, has a most significant effect on trade. The final conclusion of this study is that I must ruefully agree with Worswick that econometricians "are not ... engaged in forging tools to arrange and measure actual fact so much as making a marvellous array of pretend tools which would perform wonders if ever a set of facts should turn up in the right form."

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THE ECONOMIST AND THE ENVIRONMENTALIST - FRIENDS OR FOES?

by Sandra McNally

INTRODUCTION

ENVIRONMENTALISTS and economists are often perceived to have very different views. Most economists are avid followers of free trade and believe in only a limited role for the government. On the other hand, environmentalists tend to emphasise market failure and lobby the government to intervene to protect the environment. A fear is often expressed by economists that the environment will be used by governments as an excuse to pursue interventionist polices.

This essay will use the example of fisheries to show how policies intended to protect the environment can sometimes lead to economic inefficiency. In fact because the government have incomplete information regarding the environment, well-intentioned policy can often be sub-optimal even from a purely environmental perspective. However it is possible in certain cases to design policies that satisfy both economists and environmentalists. Thus the two separate philosophies are not always incompatible. These points shall be illustrated in the following case study from the Irish fishing industry.

Both economists and environmentalists would agree that some form of government intervention is needed to protect fish from over-exploitation. Where fish is an open access resource, i.e. property rights are not well defined, the activities of exploiters would render many types of fish species extinct in the absence of government intervention. Different types of policy can be devised to prevent this. Three such policies will be discussed here and their implications for economic efficiency will be commented upon.

DEFINING PROPERTY RIGHTS - THE EXAMPLE OF AQUACULTURE

When the property rights of finite resources are well defined, producers have an incentive to preserve the stock for future profits. Thus they will not over-harvest and exhaust it. Aquaculture is a suitable example of this fact. The owner is responsible for the controlled raising and harvesting of fish. This exclusive control allows the owner to invest in the resource and to manage it effectively and efficiently. In recognition of the benefits of aquaculture, E.C. structural policy

encourages its development. Ireland is classified as a "sensitive region" and is thus eligible for preferential rates of grant aid for this purpose. Thus aquaculture is an example of where economic and environmental objectives can be pursued in tandem. However this technique is not suitable for all types of fish species.

The Command and Control Approach

This is perhaps the most obvious way to reduce over-fishing. The government can increase the real cost of fishing by introducing regulations. If effective, this policy will curtail the yield to a sustainable level. Unfortunately such a policy is often extremely inefficient from an economic perspective. Tom Tietenburg(1992) illustrated this in his case study about how the U.S. government intervened to resolve the problem of over-fishing in the Pacific salmon industry.

Inefficiency resulted from government policy because the fish could not be caught at the lowest possible cost. Regulations were introduced that banned the most efficient techniques of catching fish and placed limitations on fishing times and fishing areas. Thus resources were wasted. In addition a ban on new technology was introduced in response to fears that adopters would increase their catch at the expense of smaller fishermen. Thus this type of policy hindered the development of the industry.

The E.C. Common Fisheries Policy could also be classified as a type of "command and control" approach. Total Allowable Catches (TACs) are fixed each year for certain fish species within different zones of the Community waters. The TACs are then allocated between different member states in the form of quotas. Limitations on the number of fishing days and other such restrictions are imposed so that each country does not exceed its permitted quota.

A major problem with E.C. policy is that quotas are sometimes misallocated. For example, in 1990, quotas for some species in the Irish Sea were so large that they couldn't be filled by fishermen. The fish simply were non-existent. In contrast, quota restrictions in the North Sea recently prevented Scottish fishermen from benefitting from abundant supplies of haddock. This was at a great social cost to local fishing communities. Such quota misallocation often defies the objectives of both economists and environmentalists.

Individual Transferable Quotas

Although it would be almost impossible to introduce such a policy at an international level, there are circumstances within countries where a system of individual transferable quotas could be applied. For example in 1983 the New Zealand government introduced such a policy in an effort to protect its deepwater trawl fishery. This is an economically efficient way to protect renewable resources from over-exploitation. Here the government fix the number of quotas such that the

stock cannot be harvested beyond a certain level at which the resource can renew itself. Quotas are allocated to fishermen on some basis, e.g. in proportion to historic catch. Since these quotas are transferable, fishermen with higher costs can make a profit by selling their quotas to those who have lower costs. Thus the entitlement to fish flows naturally to those who benefit most from it because their costs are lower. Individual transferable quotas also encourage fishermen to invest in new technology so as to make better use of their existing quotas and make it profitable for them to purchase quotas from other people.

Conclusion

Although economists and environmentalists often hold different views and look at the world through different eyes, it is possible, at least in some areas for the two groups to be reconciled. Economic theory does have an important role to play and can provide efficient answers to some environmental problems. This becomes more difficult when problems cross national boundaries, where economic theory and environmental idealism are both confronted with an imperfect reality.

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INVESTMENT IN THE FUTURE: THE ECONOMICS OF PRIMARY EDUCATION

by John O'Flaherty

"If our standard of living is to be maintained; if the growth of a permanent underclass is to be averted; if democracy is to function effectively into the next century; our schools must graduate the vast majority of their students with achievement levels long thought possible only for the privileged few."

THIS IS THE goal of education according to the Carnegie report of the Task Force on 'Teaching as a Profession' (1986), and the primary sector is where this goal begins to be achieved. With this in mind, this paper attempts to show the vital importance of primary education to a modern industrial economy, if that economy is to achieve significant levels of either growth or equality. I will also examine the erosion of funding to, and lack of concentration on the primary education sector in Ireland over the past twenty five years, leading to what I consider to be the grossly inadequate provision which exists today. I will ask why this is so, and what must be done to rectify the situation.

THE ECONOMIC IMPORTANCE OF EDUCATION

Firstly, the education budget today, at about £1.6 Billion, is the second largest element of government spending. The system employs circa 40,000 teachers and touches the lives of virtually every citizen in the state. To quote Hannan and Shortall "modern education systems have very important complex objectives - socialisation into highly complicated cultural, and ever evolving economic, social and political arrangements of their societies, individual and personal development, preparation for work and adult life, and the classification and certification of individuals' attainments". Education equips the individual with the skills necessary to survive and succeed in today's world, both as a person, and as an "economic agent".

The economic significance of education then, is clear. Blaug(1972) writes "the amount of education an individual possesses is, in all modern economies of which we have knowledge, positively correlated with personal earnings", and again

"apart from age, no factor is as powerful in its influence on earnings as the number of years schooling completed. In short additional education can be confidently expected to raise lifetime earnings". Note that the converse is also true - as one progresses through successive stages of education, the rate of unemployment falls consistently and significantly. However, it is not just the individual who benefits from education. There are significant benefits to the economy and to society also, in terms of economic growth. As Blaug points out "the extension of education tends to raise the earnings of those who have benefitted from it; therefore investment in education accelerates economic growth", and again "the disputable issue about economic growth is not so much whether education is one of the sources of growth, but whether it is a more significant source than physical capital". This point is surely obvious - no modern industrial economy can survive without the essential skills which education provides.

In LeGrand's words, "through education individuals acquire knowledge and skills that will increase their productivity when they enter employment. Thus expenditure on education is an investment that yields benefits in the form of additional production in the future", or in other words higher growth. This view, that the availability of a well educated workforce is a condition which must be met if a country is to compete successfully is widely held. The recent Green Paper stated "the achievement of economic growth and industrial development is dependent, to a significant degree, on the availability of qualified personnel".

The importance of education is clear - it represents significant costs to the exchequer, and is a source of huge potential benefit.

The Crucial Role of the Primary Sector

> *"Primary education provides the foundation for all subsequent advancement in the education system. The most formative years in a young person's development are spent at primary school. These facts alone must serve to underlie the crucial importance of ensuring the quality and effectiveness of what is experienced in our primary schools".(Report of the Review Body on the Primary Curriculum, 1990).*

Certainly the link between education and productivity is stronger with skill-based second and third level education. But, without the basic skills which are provided at the primary level - reading, writing and arithmetic, along with the personal skills necessary for successful social integration - the child cannot hope to progress to further education, or to take a successful role in society or the world of work. "The quality of education received by children during the compulsory years is of fundamental importance to their progress in later life. In particular, their

performance at that stage is a significant factor in determining their access to future education and training", (Sheehan). Yet, despite this, the government continues to ignore primary education in favour of second and third level education, leaving the primary sector in its current underfunded state.

What we are describing here is what LeGrand refers to as the "option value" of primary education. Leaving aside for a moment the huge benefits which primary education confers in itself, "an increase in the number of people with the elementary qualifications which are a necessary prerequisite for more advanced training will lead eventually to a larger number of highly trained people", and this can only have positive economic effects.

Primary Education and Equality

Most would agree that it is one's education which is the principal determinant of adult life chances. To quote Clancy(1986), "in recent years educational skills and credentials have differentiated between skilled and unskilled manual workers, and between professional, managerial and other routine service workers". Indeed a succession of studies have demonstrated a close relationship between social class position and educational attainment . This then illustrates the importance of education economic policy makers in the formulation of any strategy for promoting equality of opportunity.

The Constitution promises to cherish all her children equally, yet successive governments have failed to live up to this promise. In Hannan's words(1992) "class inequalities in educational failure are now so pronounced and so serious that a gross injustice exists in the educational provision for such children". Approximately 8% of students continue to drop out of secondary school without sitting any state examination and 13% of young people leave school without any qualifications - and these are predominantly from disadvantaged social backgrounds.

Time and again, research has argued that early school attendance is the most important target area when addressing educational disadvantage, and that to enhance equality of opportunity, state-financing should concentrate on pre-primary and primary levels. As Sheehan points out "since everyone has a relatively equal chance of benefitting from expenditure increases on primary schools, a shift of expenditure in this direction is relatively progressive, and socially desirable. Moreover, in the longer run, increased expenditure on primary schools should lessen inequalities of access to higher levels of education, and therefore improve job and earnings opportunities". Not only this but it would be far more cost effective to intervene at the primary level. As Tussing(1981) points out, "the consequences of inadequate schooling at these levels probably cannot be rectified, and certainly cannot be rectified at any reasonable cost, at later stages".

Yet, despite all this the government insists on leaving primary education underprovided for, while giving higher increases and preferential treatment to second and third level sectors, even though patent inequalities persist at second and third level. For example 30.5% of 15-19 year olds from the semi/unskilled manual class participate in fulltime second level education while the corresponding figure for the professional/managerial class is 76.4%. Also, the participation ratio for entrants to third level education in 1986 was 3.00 for the Higher Professional class compared with 0.16 for the Unskilled Manual Workers class. Taking Trinity for example, 25.6% of 1986 entrants were from the Higher Professional class; 0.3% were from the Unskilled Manual Workers class.

So, as Breen(1991) points out "it is clear that public educational expenditure, at any rate at the senior cycle of the post primary level and at third level, is regressive. The divergence between class participation ratios rise in tandem with per pupil costs as one moves into post-primary education and beyond". Thus it is that potentially able children are lost to university through failure to complete secondary education, and this failure is in turn predetermined by an inadequate primary education. But has educational policy moved to remedy this ailment? No - over the years primary expenditure has continually lagged behind expenditure at other levels. It is clear that much needs to be done, and that a major policy shift involving a heavier emphasis on primary education is vital.

The Funding of Primary Education

That primary education has been neglected for many years is a fact. In 1966 55.9% of public expenditure on education went to the primary sector, in 1992, 36.7%. Is it any surprise then that provision for primary education today is grossly inadequate? Ireland spends less per primary student than any other OECD country, and the results can be seen in our crowded classrooms, the drop-out rates among pupils with no qualifications, and the highly inequitable nature of our second and third level systems. My proposals then are quite clear. The central policy concern thrown up by my paper is how to achieve the most effective distribution of resources between the various levels of education in terms of equality and efficiency. I would argue, based on the evidence that I have presented in this paper that:

1. more money must be provided in the primary education budget.

2. in order for the Irish education system to achieve a greater level of equality of opportunity, a transfer of resources from the second and third level sectors to the primary sector should be effected.

I would envisage this redistribution being achieved in two ways :

(i)The method of financing third level education must be revised. Most third level courses confer significant economic benefits on those who complete them, and so a system of subsidised loans, rather than, or in combination with, the present grants system should be introduced. This would shift the burden of expenditure from the taxpayer to those who benefit from the expenditure i.e. the students. It would also free up funds which could then be reallocated to the primary sector. The possibility of a graduated fees system, where the payment of fees is related to the ability of the student's family to pay should also be considered.

(ii)At present, public funds contribute approximately £25 million to exclusive, private, fee-paying secondary schools.Thus the state, by funding, on equal terms, fee-paying and non fee-paying schools, allows the former to maintain their relative superiority - so that the inequality between better and less well-off is maintained. This contribution should be stopped immediately and any savings redistributed to the primary sector.

Conclusion

The paper has described the vital significance of the education system to our economy, in particular the role which primary education has to play in increasing growth and reducing inequality within our society. I have also shown that the funding of primary education has not increased commensurately with the funding of the education system as a whole, due to a change in emphasis away from the primary sector, a change not based, so far as I could see, on any educational, economic or sociological grounds. So, the system cannot at present function effectively. In the final section, I indicated the policy implications of my study, and how I believe a huge improvement in education generally and particularly in educational equality could be achieved. I feel that if such proposals were put into effect, our economy and our society could only be the better for it.

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EUROPEAN ECONOMIC ASSOCIATION
SEVENTH ANNUAL CONGRESS

28-31 AUGUST 1992
TRINITY COLLEGE DUBLIN

AS PART OF the College's Quatercentenary celebrations the Department of Economics T.C.D., played host to the Seventh Annual Congress of the European Economic Association from the 28-31 of August 1992. In effect, this was the largest gathering of economists ever assembled in Ireland. Over 600 delegates from all over the world attended the Congress, including some of the most influential names in the world of economics such as Paul Krugman, Professor of Economics at MIT, and Assar Lindbeck, Chairman of the Nobel Prize Committee in Economics to name but a few.

The Congress was opened by the Chancellor of the University, Dr. Frank O'Reilly, who reminded the delegates that Trinity was one of the first universities in these islands to establish a Chair in economics — the Whately Chair of Political Economy, established in 1832 , which is presently held by Professor Dermot Mc Aleese and whose famous predecessors included Issac Butt and John Elliot Cairnes. In keeping with this sound economic tradition a good number of the 300 papers delivered to the Congress were presented by Irish delegates from TCD, UCD, the ESRI, Queen's and the NIERC in Belfast and indeed many others based overseas.

There were three special lectures on Monetary Economics, fourteen Invited Paper Sessions and sixty-eight Contributed Paper sessions - with over 300 papers being delivered. "Privatisation in Eastern Europe", "Labour Migration in Europe", "Economic Reforms in Russia" and "Economic Geography" were but just a taste of the delights on offer from the world's finest economists.

However it was not all work and no play, the delegates got a chance to sample Irish hospitality, food, drink, and 'craic' in a social programme that included a Civic Reception in the Exam Hall, a buffet dinner and concert in the splendid surroundings of the National Concert Hall and last, but not least, a State Reception in Dublin Castle.

In all, the congress was a tremendous success, the standard of economic debate was superlative and all praise should be given to the local organising committee, chaired by the Senior Dean, Dr. P. J. Drudy, without whose time and effort, a mammoth task such as this, could not have been undertaken.

Aileen Gerrard

PROCEEDINGS OF THE STUDENT ECONOMIC WORKSHOP 1992-1993

VARIETY IS THE spice of life, and indeed the Student Economic Workshop has seen plenty of variety so far this year, with many diverse topics coming up for discussion. With Ann Murphy at the Chair, Stephen Weir kicked off Michaelmas Term with an excellent paper on the social costs of Monopoly, during which he argued that Harberger's Triangle was an inaccurate tool for evaluating the full costs of monopolies.

This paper was followed by a thought provoking delivery from Rory Carroll on Third World Aid. He pointed out that by the year 2000 one quarter of the developing world's population will have an income which is inadequate to meet their most basic needs and that around half of this number (600 million) will lack the most basic necessity - adequate food. UNICEF has calculated that the additional financial resources required to meet these basic needs would amount to 0.5% of the GNP of donor nations - for Ireland this would mean tripling current aid levels to around £120 million, a figure significantly less than the annual amount spent on the National Lottery!

Tony Lynch followed by delivering a paper entitled "Devaluation - No Retreat, No Surrender", arguing that the Government should continue the hard currency policy pursued up until that point . Unfortunately, subsequent events invalidated the debate, yet it still proved to be a heated one, with prominent members of the Economics Department airing their respective views.

Hot on his heels was Ann Murphy, with a rhetorical question "Pollution - No Solution?" Ann argued that the Coase Theorem was theoretically quite valid, but difficult to apply in a real economy, as property rights are ill-defined. She concluded that if a system of individual tradeable permits could be applied in some countries, the problem may be remedied.

Stephen Weir had a second outing with another excellent paper on Investment, dealing with the intricacies of the Capital Asset Pricing Model. This was followed by Pat McColgan on his chosen subject "Free Trade in a not so free World". In this paper he outlined the classical Ricardian argument on trade, which views free trade positively, the counter argument being Paul Krugman's "New Trade Theory" which implies that free trade may not always be the optimal approach in all circumstances. The ensuing debate was broadly based and informative and in end he concluded that free trade is not always preferred option.

But all is not yet over. The Student Economic Workshop has a packed agenda for Trinity Term, with two more papers to be delivered; one on Unemployment and the second on the implications of the CSO's readjustment of the Balance of Payments figures for Industrial and Economic Policy. Of course the highlight of the year for the Workshop will be the forthcoming Colours Economics Debate on April 14th between the old sparring partners - UCD and Trinity. UCD are this year's hosts with Trinity proposing the motion *"That this House would Float"*. The speakers for Trinity are; Siobhan O'Dwyer, Donal O'Reardon, Nicholas Holman and Celine Armstrong, (who, as a member of last year's winning team, rode roughshod over UCD's arguments). The Workshop wish this year's team the best of luck.

Much credit is due to the many contributors and indeed to the Chairperson Ann Murphy, who have worked hard to make this year yet another highly successful and enjoyable one for the Workshop. The quality of the economic debate at the regular meetings, and the standard of essays in this year's *Review* bears testament to their enthusiasm. With such a high level of commitment amongst the student body, the future success of the Workshop is guaranteed.

Aileen Gerrard