Sustainable Development: Remembering the future

Claire Thornhill – Senior Sophister

The concept of sustainability, meeting this generation's needs without compromising the ability of future generations from meeting theirs, is very much en vogue. *Claire Thornhill distinguishes between growth and development and discusses the biophysical and ethico-social limits to growth. She discusses how best to divide exhaustible resources intergenerationally and how to preserve the environment. She concludes that a greater focus must be placed on the generations still to come.*

Introduction

'Simply put, growth is quantitative increase in physical dimensions; development is qualitative improvement in non-physical characteristics. An economy can therefore develop without growing, just as the planet Earth has developed (evolved) without growing.' (Daly, 'The economic growth debate.')

While the term 'growth' can be used to mean increases in physical production, consumption, and the stock of human and capital, 'development,' on the other hand, can refer to improvements in the standards and quality of what is produced, consumed, and of the physical stock. In standard neo-classical economic theory, growth is an important goal. In practice also, governments also usually use physical growth as a proxy for welfare, leaving out of the calculations the costs to the environment of this growth, and the damage to future prospects.

Sustainable development is the phrase now used to emphasise the aim for development instead of growth. There are many definitions, but generally it can be said to involve maximising the net benefits of economic development, subject to maintaining the services and quality of natural resources over time. Sustainability is principally an equity issue rather than an efficiency issue and puts particular stress on the need not to overexploit the world's resources, in view of the fact that future generations also have a right to their use and enjoyment.

Why is it, then, that some economists choose sustainable development over growth as an aim for society? The argument is that, given only finite resources on Earth, there must be some limits to physical growth. From classical economists like Malthus in the nineteenth century, to twenty-first century economists such as Richard Douthwaite, the claim that the planet's resources cannot sustain continuous growth of population and economy indefinitely has often been made. Put simply, the argument is that 'anyone who believes exponential growth can go on forever in a

finite world is either a madman or an economist' (Kenneth Boulding in Douthwaite, 1990).

Limits to growth

Since Kenneth Boulding's article of 1966, 'The economics of the coming spaceship Earth', discussion of the limits to growth has based much of its reasoning on the first two laws of thermodynamics. The first law of thermodynamics states that matter, like energy, can neither be created nor be destroyed. As more matter is extracted by the production process, more waste is generated which must be returned to the environment, as the law states that its matter-energy content cannot be destroyed. The second law of thermodynamic states that in a closed system, the use of matter energy causes a one way flow from low entropy resources to high entropy resources; from order to disorder. As an energy resource is used, the amount of work that that energy can do is diminished. The major implication of this law is that energy cannot be recycled in such a way that we get back all the capacity of the original energy source to do useful work, since the act of using the original low-entropy resource means some of its energy is lost as heat (Hanley *et al.*, 1997).

Neo-classical economics is based on the assumption that the economy is far from the limits of desirable growth. However, some economists, like Herman Daly, argue that in reality, there are limits to the resources of the environment and consumer wants and that we are operating very close to these limits. This being the case, we are unable to assume that an increase in economic welfare causes a corresponding increase in total welfare, as the negative externalities might more than outweigh the material gain. While development is not limited by the same constraints, Daly pinpoints two general classes of limits to growth, namely biophysical and ethico-social.

Briefly, biophysical limits to growth can be based on the view of the economy as 'an open subsystem of a larger, but finite ecosystem' (Daly, 2001). Because the economy is part of the ecosystem, it cannot grow larger than it. Because of the second law of thermodynamics, matter and energy cannot just keep on flowing around in an isolated system. There are outlets of energy, as well as inlets from the sun. Daly (*ibid.*) sees instead, a 'one-way, linear entropic flow (throughput) from the environment (depletion) through the economy (production and depreciation), back to the environment (pollution).'

Even if the biophysical limits to growth are not recognised, ethico-social

limits still apply. Ethico-social limits to the desirability of growth are bound up with our moral duty to future generations, the possibility of driving species to extinction, the negative externalities that too much growth can have and the moral degradation that a glorification of self-interest can have on society.

Douthwaite, a strong opponent to current attitudes to growth, illustrates one particular limit to the desirability of growth. Douthwaite cites a survey by the British Social Science Research Council, which revealed when the survey was carried out over 25 years ago, 71% of British people already considered non-materialistic aspects of life, such as their family situation, as most important to their 'quality of life' (Douthwaite, 1990). It is perhaps possible, then, that consumer wants for material goods can be satiated and that developed countries are near to some ethico-social limits to the desirability of growth. However, this result is not relevant to the populations of developing countries, where material needs are of a much more fundamental kind. There, some of the ethico-social limits to the desirability of growth may still be distant.

Distributing exhaustible resources

Once economists accept that limits to growth do exist, a plan for sustainable development is necessary. There are a number of different approaches, often referred to as rules, involved in managing sustainability. The Hartwick-Solow approach to sustainability rules is based on Hartwick's assertion in a 1977 paper that as long as the stock of capital did not decline over time, non-declining consumption was also possible (Hanley *et al.*, 1997). His approach requires the application of Hotelling's rule, which states that the price of an exhaustible resource must grow at a rate equal to the rate of interest, both along an efficient extraction path and in a competitive resource industry equilibrium, for resources to deplete at a socially optimal rate. Hartwick argues that the stock of capital could be held constant by reinvesting all Hotelling rents from non-renewable resource extraction into manmade capital. Thus, for example, as the stock of coal depletes, the stock of manmade capital increases as a replacement.

For Hartwick's rule to hold, two very strong assumptions must be made. Firstly, it is assumed that the aggregate final production function is a Cobb-Douglas, and secondly, that manmade and natural resources are perfect substitutes for one another. As well as pointing out that the natural environment has value beyond its role as an input to the production process, critics of Hartwick's sustainability rule have focussed on the strength of his assumptions.

The London school takes a different approach to sustainable development (for example Pearse and Turner, 1990). Here it is acknowledged that there is a degree of substitutability between manmade and natural capital but that many natural resources supply non-substitutable services to the economy. Pearce and Turner (1990) focus on the question of depleting exhaustible resources, and include the assimilative capacity of the environment as another renewable resource. As exhaustible resources are depleted, their reduced stock should be compensated for by increases in renewable resources, as the substitutability between exhaustible resources such as fossil fuels and renewable resources such as solar energy is recognised. They also note that because efficiency is growing as a consequence of technological improvements, advanced economies may need less energy to produce an extra unit of GDP than they did in the past.

Population growth, however, may more than offset the positive effects of increased efficiency and technological development. Even without this consideration, technological progress as a means to offset depleting resources has its caveats. Firstly, new technology is not necessarily less polluting. When the focus on developing new technology is geared towards making it more efficient or attractive to consumers, the positive effect it sometimes has on pollution is incidental. Although communication by email is less polluting than communication involving vehicles, the latest polystyrene coffee-cup might represent an improvement in heat retaining ability rather than in pollution abatement. Secondly, there is nothing to prove that man can improve technology indefinitely.

The question of how much of the natural capital stock should be maintained for future generations is complicated by the difficulty in quantifying natural resources. The difficulty in aggregating unpolluted lakes with acres of forest, or oceans with whales, could be overcome however, by dividing the natural stock into sections and maintaining a certain level from each section. If this does prove to be a viable way to aggregate resources, the London school suggests that reduction in the level of natural resources below some constraint value should be prevented. Instead of advocating the current level of natural resources as a target, the use of 'shadow projects' has been suggested. The policies would add to the stock of natural resources, to exactly offset falls to a collected group of projects that they are shadowing.

Environmental degradation

Another approach to sustainability is that of safe minimum standards. This assumes that society is unsure about the true costs that environmental degradation will have on the future. Deciding to conserve a resource is the risk-minimising approach and thus, this analysis shifts the burden of proof from those who wish to conserve to those who wish to exploit. The safe minimum standard rule states that reductions in the natural capital stock below the safe minimum standard identified for each component of this stock should be prevented, unless the social opportunity costs of doing so are unacceptably large (Hanley *et al.*, 1997). The approach however, presents problems as the minimum standards have only been worked out in flora and fauna. In addition, what constitutes 'an unacceptably large' social opportunity cost is open to argument.

Daly has also identified 'operational principles' for sustainable development. Firstly, all harvest levels should be set less than or equal to the population growth rate for some predetermined population size. Regarding pollution, for degradable pollutants, assimilative capacities for receiving ecosystems should be established. For cumulative pollutants, the discharge should be set close to zero. To maintain the stock of resources, receipts from non-renewable resources extraction should be divided into an income stream and an investment stream. The investment stream should be invested in renewable substitutes (for example, biomass for oil) such that, by the time periods when the non-renewable resource reaches the end of its economic extension, an identical level of consumption is available from the renewable substitute to what was available form the non-renewable resource at the start of the depletion programme. Only the income stream should be available for consumption (Hanley *et al.*, 1997). Criticism levelled at Daly's rules for sustainability is that they may be very difficult to apply as the assimilative capacity of the environment, for example or the possible size of the investment stream would be very hard to calculate.

Conclusion

The key to sustainable development is its focus on intergenerational equity. Putting an economic value on all the environmental externalities in the economy, for example, would certainly cause greater intratemporal efficiency, but would not satisfy that "sustainable development [be] a requirement to our generation to manage the resource base such that the average quality of life we ensure ourselves can potentially be shared by all future generations" (Asheim, 1991: in Hanley *et al.*,

1997). Thus the theories of sustainability rules outlined above are all concerned with the management of natural resources or whether manmade resources are a suitable substitute. The varying approaches to this problem highlight the many issues of scientific uncertainty and difficulties in valuing environmental resources. The common goal however, is to take the rights of future generations into account when formulating economic policy. As the late David Brower, founder of Friends of the Earth put it: 'We do not inherit the world from our fathers, we are stealing it from our children.'

Bibliography:

Boulding, K. (1966) *The Economics of the Coming Spaceship Earth.* In Henry Jarrett (ed.) "Environmental Quality in a Growing Economy, Essays from the Sixth RFF Forum" Baltimore: Johns Hopkins Press.

Daly, H. (2001) "The economic growth debate: what some economists have learned but many have not" in *Earthwatch Magazine*. Earthwatch: Dublin.

Douthwaite, R. (1992) *The Growth Illusion.* Dublin: Lilliput Press.

Hanley, N., J. Shogren, & B. White (1997) *Environmental Economics in Theory and Practice*. London: Macmillan.

McCoy, D. (1993) Sustainable *Development - The Challenge for Irish Economic Policy Makers*. Journal of the Statistical and Social Inquiry Society of Ireland. 26(5), Dublin.

Pearce, D., & Turner, R Kerry (1990) *Economics of Natural Resources and the Environment*. Hertfordshire: Harvester Wheatsheaf.

The Problem of Population Growth in Less Developed Countries

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Many see population growth as the central problem facing less developed countries in the twenty-first century. Andrew Whitty challenges this, asserting that, while population is a problem, it is economic underdevelopment that is the most pressing concern. He then discusses the extent of the problem of population growth and its causes. He brings his discussion to a close with some policy suggestions aimed at alleviating this problem.

Introduction

In the public mind, population growth is seen as the major cause of problems to do with development today. (Furedi, 1997: 1)

The above quotation gives clear evidence to how population growth is seen as a problem in the world today. The purpose of this essay will be to discuss the problem of population. This essay will first of all examine whether population growth is the most central problem facing less developed countries. In other words is there a clear link between the failure to curb population growth and the failure to develop economically? Secondly, the case of India will be explained and the extent of population growth and the main causes will be outlined. Lastly, suggestions will be made on how policy approaches can effectively reduce and stabilise this population growth.

Is population growth the most central problem in LDCs?

It has been argued that population growth is the most central problem facing less developed countries. Indeed the main proponents of this argument are known as neo-Malthusians, who believe that the primary weapon against the population growth explosion is widespread use of contraception. Like Malthus himself, they believe that population growth is the cause of the world's socio-economic problems. As Bandarage (1997: 5) says:

> *Blaming global environmental destruction, poverty, hunger, and political instability on a massive and unprecedented increase in the human population in the third world neo-Malthusian policymakers look to what they call the 'contraceptive revolution' as the most urgent remedy for these problems.*

However many experts treat this narrow view of the problem with scepticism. According to Buchholz (1999: 43), "misery may have visited the poor, but not for Malthusian reasons." On its own, population control "does not lead to the alleviation of poverty" (Bandarage 1997: 6). It is the thesis of this essay that population growth is not the most central problem facing less developed countries. In fact the assertion that population growth is the central problem serves to distract from the more fundamental problems that do face less developed countries. As Furedi (1997: 51) argues, "moreover a decrease in the size of the population would not solve any of the underlying problems."

Population growth is not the most central problem facing less developed countries, because there are other issues of equal if not more importance. These issues can be broadly defined as economic underdevelopment (Todaro, 2000). However, what exactly does economic underdevelopment mean? Todd Buchholz, in his book *New Ideas from Dead Economists*, in the course of an essay on Malthus outlined the main characteristics of underdeveloped countries:

> *First, poor countries cannot afford to save and invest in new technology because incomes are low. And incomes are low because production techniques are inefficient. Thus, they are caught in a vicious cycle, which foreign aid attempts to break. Second and much more important, many governments with unstable political roots placate urban consumers by keeping food prices low. But artificially low prices decrease investment by farmers and stunt further output.* (Buchholz, 1999: 60)

So in a nutshell, the problems of underdevelopment are a lack of proper investment where it is needed and unstable weak political leadership. The population problem arises from this. How these problems are to be addressed will be discussed in Section IV.

Another factor that must be considered when discussing development and population is the West's exploitation of less developed countries. Does the West have a hidden agenda in asserting population control? Could this be the cause of their problems? There are authors who suggest this is a problem (Bandarage 1997, Furedi 1997) "Communities tend to face crises such as endemic poverty or famine not because of their numbers but because of their relative lack of control over their circumstances" (Furedi, 1997).

The thesis behind this is that the West feels threatened by developing nations and seeks to curb their potential power through lack of development and strong population controls. Is this plausible? Perhaps it was among some powerful individuals. There is evidence to suggest that senior figures in Western governments believed in restricting developing nations. As George Kennan, member of the US state department, noted in 1948, "we have about 50% of the world's wealth, but only 6% of its population. In this situation, we cannot fail to be the object of envy and resentment" (qtd. Bandarage, 1997). This point, however, should not be over emphasised, rather it should be noted as a possible problem.

Thus far it has been stated that population growth is not the most central problem facing less developed countries and the reasons for saying so outlined. However, population growth is still a problem and one that should not be underestimated. "It could be argued that whatever the cause of Africa or any other developing regions problems, lowering the rate of population would at least make the situation better" (Furedi, 1997: 50). Stabilising growth would lead to a better environment in which the socio-economic policy will be implemented. This is certainly the case in most countries, especially India and China. However, there are exceptions, exceptions indeed where population growth is desirable.

> *Over the last decade, many scholars have re-examined the basic question of whether population growth hurts 3rd world countries and concluded that for some countries, especially those with plenty of arable land, rapid population growth may not be destructive. A denser population may lower the cost of transporting goods to customers and stimulate domestic demand for goods. The World Bank suggests that most developing countries can absorb up to 2% growth without a decline in the standard of living.* (Buchholz 1999: 61)

In conclusion, it must be reiterated that population growth is not the main problem affecting less developed countries but that economic underdevelopment is. Population growth is a very serious symptom that must be effectively dealt with. However, it is only a symptom and the causes must be tackled as well. Economic development is a broad area that encompasses many political and socio-economic factors. Population is important in most situations but is secondary to a proper and comprehensive program of economic development. If underdevelopment is not dealt with, then the population crises will never be solved. As Alice Clark said in a lecture, "Economic development is the best contraceptive" (Overpopulation.org).

The extent of population growth

> *Measuring from the time of Christ Jesus, it took about 18 centuries for the earth to reach its first one billion inhabitants, one century to reach its second billion, and one decade to get its last billion.* (from George Moffett, in Overpopulation.org)

The above quotation puts the present crisis of population growth in context. The population situation is a serious symptom of the world's problems and must be treated effectively, so that the causes and underlying problems can be dealt with efficiently. The problem, however, must be dealt with now. World population growth is equivalent to around three babies every second. (UNPFA, 1999) The estimated population of the world in 2050 will be 9,370 million people (Todaro, 2000). This massive population will be a bigger problem for the developing world more than anyone else. It is suggested that 90% of that population will inhabit the developing world (Todaro, 2000). The question must then be asked how will a developing world be able to cope with such a population with less than 30% of the world's resources. The extent of population growth in the developing world could be extremely harmful for the future.

Although there is a rapid decrease in population growth in Europe (including minus growth in countries like Germany), this is not enough to offset the massive population growth arising out of the less developed world. India adds more people to the world every day than any other country (Overpopulation.org). India's population has now exceeded 1 billion people. For some in India, this popular milestone is cause for celebration. As a current political slogan puts it, "nothing's impossible when 1 billion Indians work together" (Poverty.net). Nonetheless, "the reality of one billion people is something else. It's a cause for very serious concern" (Ashish Bose, Overpopulation.org). Ashish Bose maintains that India has enough food for now, but each birth reduces the economy's capacity to cope.

The rural/urban divide is also an area for concern. India has two cities (Calcutta and Bombay) in the world's top ten of most populated cities. India's cities are severely overcrowded. From the 1991 census it was estimated that 26% of people lived in urban areas. Now in 2001 it is estimated to be 29%. (Overpopulation.org) India's population growth rate per annum is 1.91% (15.5 million a year). This rate is double China's and India could overtake China by 2045 as the world's most populous country (Overpopulation.org).

Cause of Population Growth

> *Its not because people started breeding like rabbits, it's that they stopped dying like flies.* (Nicholas Eberstadt, American Enterprise Institute, rpt. Overpopulation.org)

The extent of population growth now explained, the question must then be asked what are the causes of population growth? As has been said at the start of this essay population growth is a symptom of greater underlying problems broadly defined under the heading of economic underdevelopment? However, the direct causes will be dealt with in this section.

What causes population to grow rather than decline? In a nutshell, the answer is that there are more people being born than dying. The birth rate has increased because fewer babies die, due to improved medical services. For example, in 1950 life expectancy for people in developing countries averaged 35 to 40 years of age, compared with 62 to 65 years today (Todaro, 2000). As a result of the twin effects of the birth rate and death rate, there is a natural increase in population terms.

What are the causes of this high rate of natural increase? What are the factors that cause the changes in the birth rate and death rate? In essence, what are the causes of the present population explosion? One cause of growth is the higher life expectancy (as noted earlier). However, this cause cannot be dealt with, in terms of trying to reduce the population. Measures adopted to restrain and halt population growth must be preventative. Preventative action can only be taken on the birth rate.

What causes the birth rate to be so high in developing countries? There are numerous causes. A summary list is as follows:

1. High infant mortality rate, therefore couples have more children to ensure a greater likelihood of some surviving.
2. Children are security for the future because of the absence of a social welfare system.
3. Lack of knowledge or access to contraception.
4. Desire for a male child.
5. Religious beliefs.
6. Lack of empowerment for women.

Each of these will now be discussed briefly, in relation to India. According to the UNFPA, all of the above causes exist in India but some are more prevalent than others. Infant mortality rates are becoming less of a problem due to better medical conditions. The rate has halved in ten years in most states (UNFPA). However, this is causing an increase population growth as couples continue to have large families. To combat this, the UNFPA have invested heavily in "Reproductive Health" programs. These along with the government's efforts have been most effective in states like Kerala, which will be discussed in more detail in the next section. Children are also seen as security in India. This viewpoint is changing due to increased incomes and jobs. Children are no longer needed as much to provide extra income. However, due to the absence of a pension system they are still seen as security in old age.

In India the desire for a male child is quite strong, and many couples will continue to have children until such time as a son is produced. "The pressure to produce the son is so predominant that a lot of families have more children than they actually want or afford" (Shobha De, Overpopulation.org: India page). Religious beliefs are strong in India in influencing the size of families. "This is a land still bound by ancient customs and God said 'Go forth and produce'" (*ibid.*).

Lack of empowerment to women is a crucial factor. Women's role in population growth can be seen from the figures. Approximately 37% of women aged between 15 and 19 are already married. They are married and have not completed their education. Women's lack of education in India is very prevalent; 49% of females in India are illiterate compared to 26% in males[1]. Women in these circumstances would seem to need children as providing status and esteem (Bandarage 1997). All of these causes are interconnected, however, the important one is empowerment to women. Empowerment to women can largely be attained through economic development, an economic development that can break down some of the causes of the population explosion.

Policy Approaches to reduce Growth

My biggest worry is the population growth, and if it continues at the current rate we will be standing shoulder to shoulder in 2600. Something has to happen and I don't want it to be a disaster (Prof. Stephen Hawking on Larry King live from Overpopulation.org).

[1] All figures above come from Overpopulation.org.

From the outset, it has been the context of this essay that population growth is a symptom of greater ills. Unless these causes and ills are dealt with, any direct action on population growth will be deficient and defective. Therefore, any policies to deal with the issue must be asserted on two fronts. These two fronts are direct population control (e.g. contraception) and economic development projects (e.g. employment projects). The implication of policies affecting these two areas, the causes and symptoms are being tackled. This will have a positive affect on reducing population growth. Suggested policies in these two cited areas will now be summarised and explained briefly.

The truth is that economics befuddles even the sharpest mind (Buchholz, 1999: 293).

To suggest economic policies that will create growth and increase living standards in an economy is not easy. Economics is a very inexact science, however, without it we are totally at sea, to solve the economic issues of a developing nation, we have to know what they are. In the case of this essay, India's economic problems can be identified as low-income levels, lack of investment (massive Gov. deficit is 14% of GDP; FT 1999) and over-regulation of the market and the provision of a proper infrastructure. (*ibid.*) To tackle these issues effectively will produce growth, which will lead to higher living standards. If this happens then there is a high probability that population growth will be affected. (Furedi, 1997) Economic development is the best contraceptive, as already quoted.

How then, in India's present situation, can the country progress economically? According to most experts, a country must create the right conditions in the macro-economic climate for economic development. These conditions have become known as the "New Economic Consensus", which basically entails macro-economic stability through low inflation and fiscal restraint (McAleese, 1999). India has a problem in this area and is not exactly meeting the standards of the "New Economic Consensus."

"But some believe spiralling budget deficits are pushing India into a domestic debt trap. 'Either we resolve the fiscal problem or we're heading for a crisis' says Rakesh Mohan, director general of the NCAER" (FT, 1999).. India in 1999 had a growth rate of 5% and an inflation rate of 6% (FT, 1999). These figures are impressive for a country such as India, however, how does India solve the problem of fiscal restraint, when it needs to spend money in order to invest? This

investment as already noted will bring higher welfare and this in turn will have an effect on population growth.

The answer to the above query could lie in analysis of the Harrod-Domar Growth model. The Harrod-Domar growth model states that in order to grow economy must save and invest a certain amount of its GNP. The more a country saves and invests the faster its economy will grow. However, countries have a limit to the amount they can save and invest of their own resources. However, India could overcome its spending problems through transfers from the developed world. Transfers from the EU are credited with creating Ireland's present economic boom. This was also the rationale behind the Marshall plan after world war two, which re-invigorated the European economy. (McAleese, 1999; Todaro, 1999) In theory, India would have the best of both worlds. This would enable it to have a stable macroeconomic framework while also having the money to invest in India's development. India could then provide real improvement for its people, which would create the right conditions so that any population control programs would be effective.

The symptoms of population growth must be dealt with directly. The ways of doing this are outlined below:

1. More access to contraception. The UNFPA has put one of its main aims as "strengthening the logistics and management system for distribution of contraceptives and other Reproductive and Child Health supplies."
2. Empowerment to women. Providing women with a longer and more comprehensive education that will give them status and opportunities while at the same time trying to ensure a later marrying age. For example, in Kerala in Southern India, education for women is cited as the biggest cause of their successful campaign against population growth. "Literate women in India's Kerala help hold population growth nearly flat" (Overpopulation.org). Kerala has also provided many firsts like the first woman Supreme Court judge and head of the stock market. "In commercial centres like New Dehli and Bombay, moreover, employers advertise for Kerala women" (*ibid.*).
3. Offer incentives for two-children families. This is heavily tied in with providing proper economic growth so that the desire for children as security is reduced.
4. Through the media educate and create awareness of the population problem. "The media can play a greater role in creating awareness of the benefits of small families" (*ibid.*).

Conclusion

Through the course of this essay, the serious issue of population growth was discussed. This is a problem primarily for less developed countries, a problem that causes these countries considerable hardship. In summary, this essay considered the following:

- The first topic to be addressed was whether population growth is the most central problem affecting LDCs? The answer in short is no, the more important problem is lack of economic growth.
- The second issue to be considered was that of the extent of population growth in LDCs with specific note taken of the situation in India. It was seen in that the population problem in India is particularly acute, straining the countries ability to cope.
- The causes of population growth were then deliberated upon. These causes can be summed up as being that fewer people are dying than being born. People are living longer due to better health care and living conditions. The birth rate remains high due to cultural beliefs, desire for security, and lack of access to contraception.
- Policy approaches to the problem were primarily to do with encouraging economic development. The provision of financial capital without conditions or the need to repay was cited as the primary way of initiating this development. Any direct population control initiatives will be severely retarded without being accompanied with major economic reforms and projects.

> *Promoting integration of population issues within the wider development context is extremely important.* (UNFPA website)

The above quotation gives a summary thrust of the thesis of this essay. The problem of population growth is a serious one but a problem, which must not be exaggerated. Economic development is the major problem, which must be tackled. In short, if the economic stagnation of less developed countries is not dealt with the population problem will persist.

Bibliography

Bandarage, Asoka. (1997) *Women, Population and Global Crisis.* London: Zed Books

Buchholz, Todd. (1999) *New Ideas from Dead Economists.* London: Penguin.

Colman, D and F. Nixson (1999) *Economics of Change in Less Developed Countries.* London: Harvester Wheatsheaf.

Financial Times, *"India Supplement"* November 19th 1999.

Furedi, Frank. (1997) *Population and Development.* Cambridge: Polity.

McAleese, Dermot (1999) *Economics for Business.* London: Prentice Hall.

Todaro, Michael (2000) *Economic Development.* London:Longman.

Online References

United Nations Population Fund. www.UNFPA.org

World Overpopulation Awareness. www.Overpopulation.org

www.Poverty.net

Peru: A Wasted Opportunity

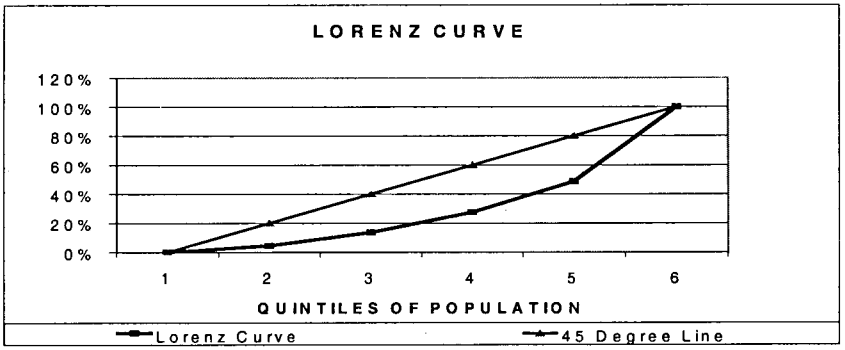
Michael King – Junior Sophister

Peru, a Latin American country looking out on to the Pacific Ocean, has been a classified a less developed country. Michael King takes an in-depth look at poverty in Peru. He introduces the country with a description of its income distribution, before describing the nature of poverty there. He then discusses the causes of that poverty. He brings his discussion to a close with a summary of policy recommendations that would reduce Peruvian poverty.

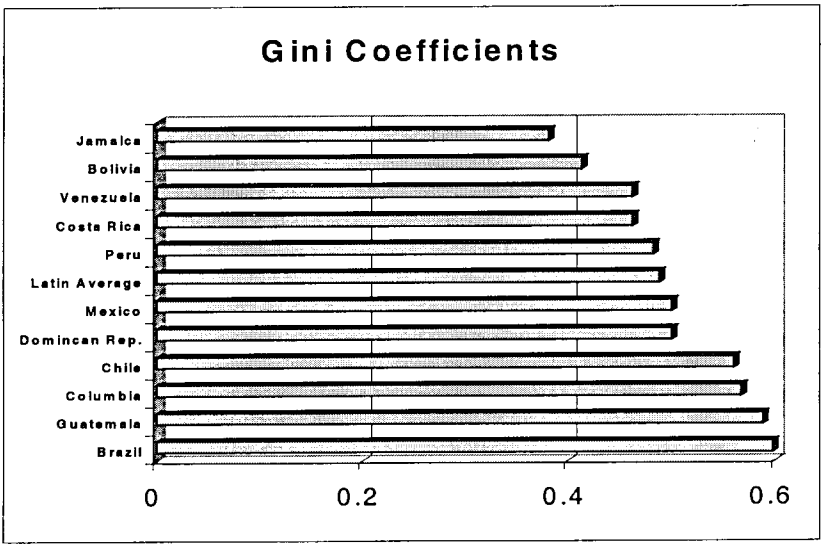
Introduction: an illustration of the distribution of income in Peru

The results of the 1996 Peruvian household survey (World Bank, 1999) illustrate the distribution of income in Peru. It is clear from the following information that the distribution of income is highly skewed in favour of those in the highest quintile. The first table shows the income accruing to each quintile. The Lorenz curve, then, is a graphical illustration of that distribution. It is quite disturbing that over 50% of total income accrues to the top 20% in society.

	% Income in each quintile				
	1st	2nd	3rd	4th	5th
1996	4.40%	9.10%	14.10%	21.20%	51.20%

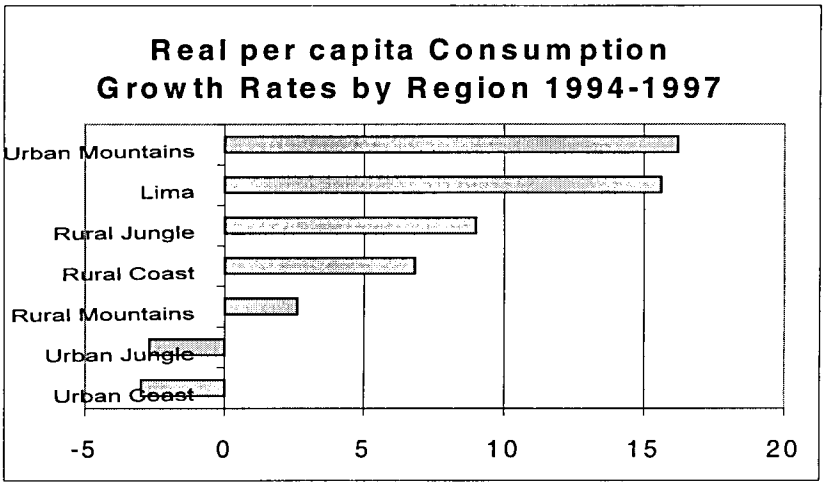


In order to compare income distributions across nations, we can use a simple mathematical construct called the Gini coefficient. The distribution of income in Peru must be considered within the context of countries with similar



resources, history and political culture. Thus it is best to compare it with other countries in Latin America to evaluate whether its distribution is a problem. The above graph (World Bank, 1998) seems to tell us that Peru's inequality is not as bad as some other Latin American countries'. Peru has a Gini coefficient less than the Latin American average, indicating than income distribution is not as heavily skewed toward the rich.

However, these are aggregate figures and give no indication of the distribution of income within Peru, a country with one of the most diverse terrains and climates on earth. Unfortunately, there are no figures available for the distribution of income for the seven areas within Peru. However, using consumption as a proxy for income, we can see how income has changed in each area in the period of national growth between 1994 and 1997. There is a significant difference between the change in consumption in Lima or mountainous towns and other towns on the desert coast and river towns in the jungle. The final table gives us an indication of the difference in income inequality between urban and rural areas. Inequality is more pronounced in rural areas than in towns and cities.



Source: Staff estimates based on ENNIV (1994-1997)

	1994	1997
National	0.469	0.484
Urban	0.437	0.441
Rural	0.494	0.5

Source: World Bank Report on Peru 1999

The nature and extent of poverty in Peru.

In order to gain an appreciation of the extent of poverty in Peru, we must establish a definition of poverty. A simple but all encompassing definition of poverty is "pronounced deprivation in standard of living." This deprivation can manifest itself in four main ways. There is firstly material poverty, the inability to consume the bare necessities. Secondly, there is access poverty, the inability to avail of state social and non-social infrastructure, health, education, transportation and telecommunications. Access to these has significant effects on a household's standard of living and its potential to escape from poverty. Thirdly, there is political poverty, an aspect of poverty only recently recognized by the World Bank (World

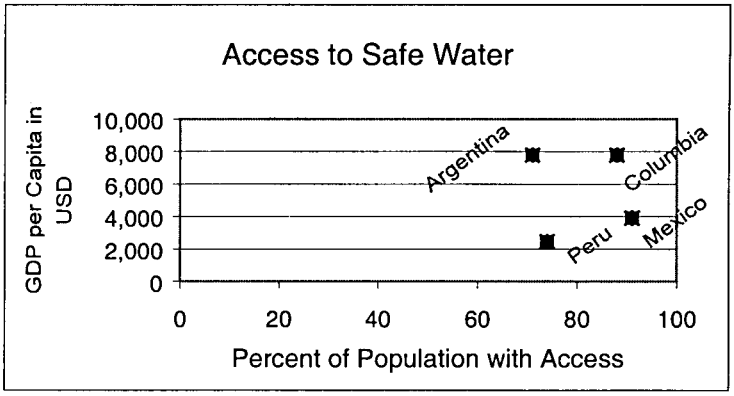
Development Report, 2000). A Latvian woman captures this aspect of poverty. "Poverty is the humiliation of being forced to accept rudeness, insults and indifference when we seek help" (*ibid.*). Political poverty encompasses non-representative government, partial judiciary and an unresponsive civil service. The fourth element of poverty is vulnerability. Vulnerability to external and largely uncontrollable events reinforces poor people's sense of ill being, and exacerbates their material poverty. These four facets of poverty frequently reinforce each other and exacerbate the deprivation in which poor people live.

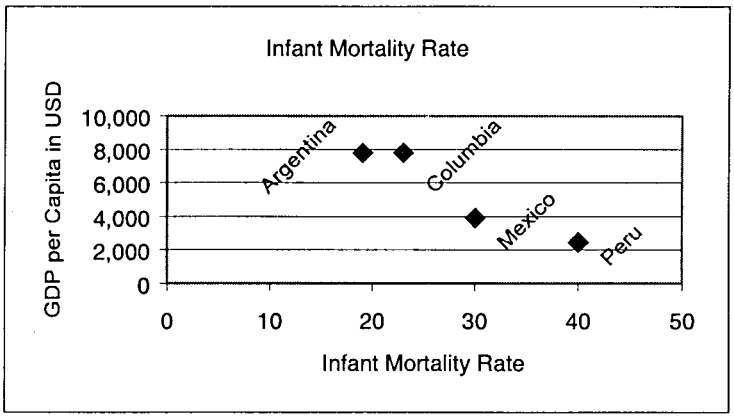
In illustrating the extent of poverty in Peru, I will first discuss the indicators of material poverty, before progressing to asset poverty, showing both internal distributions and international comparisons, before discussing the political deficit in Peru. The basic poverty rate has declined by several percentage points between 1994 and 1997 to 49% from 55.5%, i.e. roughly 12 million Peruvians (World Bank, 1999). Severe consumption poverty, an extremely austere measure, has declined to 15% from 19%. This leaves 3.6m Peruvians in immediate danger of severe malnutrition and starvation. This compares poorly with neighbours Chile, with a basic rate of 20.5% (1997), Ecuador, 35% (1994) and Columbia, 16.9% (1991). The household survey of 1994 tabulates four different poverty rates, the national rate 49%, the Lima rate 37.6%, other urban areas 44.5% and rural Peru 68.5%. These results show that poverty is more prevalent in rural areas than in Lima but with 8 million people in Lima, 37.6% is a massive 3 million people.

The quality of life indicators are reflections on both material poverty and access poverty to health care. Malnutrition rates in Peru fell from 30% to 24% between 1994 and 1997, which is significant progress. Malnutrition rates of under-5s stood at 52 per 1000 (1997), higher than Mexico (38), Columbia (30), Chile (13) and Ecuador (39). Life expectancy is 2 years below Columbia and 6 years behind the geographically similar Chile. This evidence from the World Development Report 2000 shows that not only is Peru considerably disadvantaged on a world stage, it is disadvantaged relative to its neighbours.

Peru has always prided itself for the excellent education system it provides. School enrolment topped 5m in 1997, representing over 20% of the population. However, this has not filtered through into a more literate population. 11% of people over 15 are illiterate, compared with 9% in Columbia and Ecuador and 5% in Chile. There is also a marked difference between males and females, unlike these other countries: 6% males and 16% of females are illiterate. Enrolment (91% in primary,

53% in secondary) compares poorly with Ecuador (97% and 84%) where standards are similar.





The assets, to which people have direct access, have a potent effect on their prospect of escaping poverty. From the two graphs, one can see how the relative deprivation of Peruvians compares with their neighbours. In terms of infrastructure, only 10% of roads are paved, as opposed to 17% in Ecuador. In terms of electricity, the consumption per capita is one third of Chile's and almost half that of Columbia. Telephone lines are also considerably less than in Chile, Columbia & Brazil. Sanitation connection is at 84.3% in urban areas and 11.6% in rural areas. Homes

with mud floors have increased from 41% to 43% (World Bank, 1999a).

Finally, in a populist regime like Fujimori and Garcia before him, political power is extremely centralised. It excludes representative institutions from the decision- making (Crabtree, 1998). Corruption and harassment have been features of Fujimori's regime in the 1990's and his policies are not accountable to the people. The legal system is weak, inaccessible to the poor and frequently influenced by the military and government. The lack of a party political system impoverishes the Peruvian people and the citizens have no faith in the judiciary. Political poverty in Peru is structural and severely impinges on the standard of living of the people.

The main causes of poverty in Peru

Causes of poverty are many and varied. They encompass almost all of the economic, political and social make-up of a country. Peru is not the classic under-developed economy and my argument is that mismanagement is the key cause. I identify the macroeconomic disaster of the 1980's and the inability to control the narcotics trade, the inability to provide adequate services to the poor, the representative deficit in politics, the corrupted and weak judiciary, and the non-preparation for crises, as chief among these causes.

Mismanagement

When Alan Garcia, the youthful leader, took office in 1985, GDP was 6% lower than in 1981 and real wages 40% lower. His economic "Plan de Emergencia", which restructured fiscal and monetary policy, was slow to show results and financial discipline was relaxed. Monetary controls were ignored and policies coercing business to buy bonds were introduced, with a devastatingly negative response. Inflation soared; strikes and civil unrest ensued. The annual inflation rate to March 1989 was 3414%, with devastating effects for real wages and in particular the poor. The Garcia administration single-handedly depreciated the earnings of the poor and eliminated their savings, with GDP per capita down to levels not seen since the 1960s. Accumulated inflation between July 1985 and July 1990 was 2.2m per cent. To Fujimori's credit, and why many supported him till the bitter end, he managed to stabilise the economy. Inflation was reduced and he redefined the role of the state. No longer was the state the principal actor in the economy. Instead, it was to take up its proper responsibilities of ensuring health, education, security and adequate supervision (Goodhart, 1994). He achieved moderate growth rates, but well below the country's potential in my opinion. The poverty caused by fiscal

mismanagement in the 1980s will plague Peru well into the 21st Century.

Political poverty

Populism is a style of government characterised by an appeal from strong charismatic leaders to the people, over the heads of existing parties and politicians and unrestricted by institutions (Crabtree, 1998). In Fujimori's case, he has concentrated power on himself and his elite, bringing to nil public accountability and input. Despite bringing economic stability, he has failed to ensure this will continue in his absence, by not reforming the political structure to ensure ultimate power doesn't reside with one individual. This renders uncertain Peru's economic future. His failure to widen political power has led to the political deprivation of the people, and restricted investor confidence in the sustainability of economic stability. While Fujimori's and Garcia's economic policies had startlingly different results, both were leaders of an authoritarian inclination, disposed towards abruptly changing the existing rules of the game when it suited them. Both shunned sharing power with others, preferring to bypass institutions and legitimise themselves through direct appeal to the people (Crabtree, 1998).

This propensity towards populism is closely related to the absence of a functioning and embedded system of representative government. The people feel they have no political input and when they do, in the presidential election every five years, their say is influenced by military involvement, harassment and media bias. The most recent example of this was Fujimori re-election to a third term in office in June 2000, before which he changed the constitution, which previously had a maximum of two terms. Peruvian politics in the 1990s has seen the collapse of political parties as mediators between state and society. This has marginalized the public further from decision-making. The Peruvians are voiceless and powerless. This subjects them to rudeness, humiliation, shame, inhumane treatment and exploitation at the hands of the state and the military.

In an ideal political environment, the legal system should guard against abuse of power by the state or other agents and is independent of executive and legislative branches. However, the judiciary in Peru has never enjoyed political autonomy. The system is slow and unreliable and the low salaries encourage corruption. According to Javier de Belande (1995), the man in the street sees the law as something arcane, remote and divorced from his everyday interests; he seeks to avoid the system, preferring to resolve his problems in informal ways. Corruption is widespread among the governing elite and takes its toll on economic performance.

The burden of petty corruption falls disproportionately on poor people. It increases taxation on the poor in Peru and biases government away from socially valuable goods. It diverts public resources from infrastructure investment for the poor to defence contracts.

Narcotics

The Haullaga valley is the most important coca-growing zone in the world. According to US officials, 200,000 acres of coca were under cultivation in Haullaga in 1990, almost 40% of the world's coca crop. Most of Haullaga's coca farmers are poor migrants from the Andean highlands, who own small plots of a few acres or less. They sell their coca harvests to wholesale buyers who process the leaves into cocaine. Many of the manufacturers in the Haullaga were Colombian representatives of the big name traffickers like the Escobars and Ochoas. In my research, I have uncovered a few ways in which the production and trade of coca impacts negatively on Peruvian poverty.

First, it increases poverty by shifting resources away from food production, pushing up domestic food prices to the detriment of those lacking assets to purchase basic bundle of goods. Secondly, many harmful chemicals dumped into rivers kill wildlife and are detrimental to the health of the working population. This serious degradation of the environment hinders production of all products, reduces tourism, kills wildlife and farm animals and has a serious impact of the economy, outside of ascetic consequences. The illegal nature of the industry and the figures involved significantly reduce governmental tax intake, hindering redistribution. Furthermore, its illegal nature coupled with free foreign exchange market contributes additionally to the money laundering of narcotics. The latter becomes the *de facto* regular of the foreign exchange market, with the undermining of Lima's monetary and exchange rate policy (Crabtree, 1998). In addition to this, the necessary accompaniment of guerrilla groups discourages investment in the region. If the threat of violence were not around every tree, primary, secondary and tourist investment would embrace the region to a greater extent. Unfortunately for Peru, the supernormal profits of cocaine cultivating and manufacturing do not, in the main, accrue to its residents.

Sub-optimal exploitation of resources

Growth potential in the Peruvian economy is enormous. The 2.4% growth

rates of the Fujimori regime have been well applauded and appreciated by much of the population. The system's inherent instability and absence of progress towards representative government would have hindered significantly the extent of foreign direct investment's embracing of Peru in my opinion. A civil society that has the potential to revolt at any time in no way aids the security of assets.

Although agriculture has fallen as a percentage of GDP, it does provide a living for large sections of Peruvian society. The destruction of the estates and the expropriation of land scared investors away from the sector. Peru has the great asset of being one of the most botanically and zoologically diverse countries in the world. Within its borders, it can count 84 of the 103 different climates classified by the World Bank and its three distinct zones, Costa, Stena and Seba, each favouring different products (Goodhart, 1994). The coast has large areas of land that can still be brought into cultivation through new irrigation systems. It is also estimated that the jungle has two million hectares of jungle suitable for intensive cultivation (Goodhart, 1994). Not only are Peruvian yields far below international standards, they are also way below what used to be achieved in Peru itself. Peru has a great chance of becoming a major force in agriculture if they encouraged farmers to turn their attention towards foreign currency earning export goods like asparagus and investment.

Peru's massive coastline is one of the country's greatest assets. There is high diversity in the fish stocks, which has yet to be developed properly. One of its problems is that it concentrates to too great a degree on low margin catches such as anchovy and sardine (Goodhart, 1994). It also suffers from underdevelopment; the Peruvian fleet lacks refrigeration facilities and has a much shorter range. Another example of this is that although Peru is the number one fishmeal exporter, it is not the world's most efficient producer. Further investment in new technology for the countries processing plants is necessary.

Peru is well endowed with mineral wealth; after all it was this wealth that attracted the Conquistadors. The oil giant, Shell, discovered the Cami sea gas field just north of Cuszo in the mid 1980s. It is estimated to hold 10.8 trillion cubic feet of gas and a little under 1 billion barrels of oil (Sachs, 1991). This resource, if administered properly, would provide massive benefit to the Peruvian economy. An example of this is the possible wiping out of the current Peruvian power shortage and crises which result when lack of rainfall reduce capacity from hydroelectric stations. There is a similar story with Peruvian manufacturing, where investment and energy shortages from droughts have lead to industrial stagnation.

Peruvian tourism is another striking example of a missed opportunity. The natural beauty of Peru has long been an attraction for foreign visitors, from the mountain top ruins of Machu Picchu, to the deep jungle, from the sea wildlife of the Parachus to Lake Titicaca. Peru's diversity of terrain, plant life and wildlife is second to none. Tourist numbers visiting peaked at 370,000 per annum by 1980 (Goodhart, 1994). Since then, the gradual collapse of Peru's image overseas, resulting from terrorism, hyperinflation, extreme poverty and the cholera epidemic, has led to a sharp drop in numbers visiting the country. The late 1990's, with a stable civil society, saw a temporary resurgence of tourist numbers. However, 2000 was a disastrous year with political instability deterring a significant number of travellers. The potential benefits from a developed, properly managed tourist industry in Peru, is exponential. The presence of political stability could mean that the industry could treble in 10 years with benefits for those in poverty. A quick glance at the numbers of visitors registered by other South American countries confirms this, 6.5 million in Mexico and 1.3 million in Chile.

Social Services

Access poverty refers to non-ownership household wealth which greatly contributes to the well being of the household. An overriding problem is the lack of scope for extra spending on services and infrastructure, within given fiscal limits. Secondly, within the given fiscal limits, resources are not allocated appropriately. In aggregate terms according to the World Bank (1999) Peru continues to allocate fewer resources to health than most of its neighbours. Thirdly, inequality is illustrated by the fact that while the rich spend more on private health care, the ministry of health does not redress this imbalance by directing almost equal amounts to the poor and non poor instead of serving the poor (*ibid*). The World Bank Peruvian Health Report describes it as fragmented and lacking competition and refers to the non-separation of financing and provision. There is a similar story in education.

Infrastructure

In terms of infrastructure, power shortages were one of the principal reasons for a drop in industrial output in 1992. An improvement in the country's power generating and distribution capacity is vital if growth is to be improved. This is also a source of poverty to those in both urban and rural areas, as they are not connected. Peru's road network is in a parlous state, its rail system inadequate. If

fiscally viable it is important as far as industrial growth is concerned to expand both these networks. On average there are only 2.4 power lines per inhabitant, and only 1.4 lines per rural inhabitant, which is less than Peru's neighbours (Goodhart, 1994).

Natural Disasters

If one considers that 3.6m Peruvians face imminent starvation and 11m are in poverty, natural disasters have devastatingly pronounced effects. El Niño, and Peru's history of earthquakes, volcanic activity and avalanches are a constant threat to Peru's poor. Each disaster as they occur will force thousands into poverty.

Conclusion: a summary of how such poverty might be reduced.

Approaches to reducing poverty have evolved over the past 50 years in response to a deepening understanding of the complexity of development. The importance of access to education and health was highlighted in the 1970s. The 1990 World Development report broadened this, emphasising asset building, the microeconomic environment and low cost labour. However the 1990s and the mixed experience of developing countries, had led the World Bank to broaden their thinking to include vulnerability and exposure to risk, and voicelessness and powerlessness. The 2000 World Bank report on poverty aggregates policies aimed at reducing poverty into three areas.

Firstly there is promoting opportunity, i.e. poor people's ability to access material goods such as jobs, credit, roads, electricity, and markets for their produce through market liberalisation, schools, water, sanitation and health care. Overall economic growth is crucial for generating opportunity, but so too is redistributing policies that are biased towards the poor in education and health care. The second aggregated policy aim is facilitating empowerment for citizens. Diffusing political power to the people, creating representative institutions and mechanisms that are responsive and adaptable to the will of the people. An unbiased and efficient legal system is also required. It also involves the encouragement of participation of minority ethnic groups and poor people. Finally, enhancing security, reducing vulnerability to economic shocks, natural disasters and ill health, is central to enhancing well-being and in turn reinforces opportunity, as it encourages investment and higher risk return activities.

These three policy aims are deeply complementary. For example promoting opportunity through asset and market access increases the independence of the poor, strengthening their bargaining position relative to state and society. It also enhances security, since an adequate stock of assets is a buffer against adverse shocks. Similarly, strengthening democratic institutions and empowering the disadvantaged, for example, by eliminating legal discrimination will in turn expand their economic opportunities (World Bank, 2000). An effective poverty reducing strategy in Peru will require action on all three fronts by all actors in society and will have to reflect and suit the country's social, and economic characteristics. With these three policy aims in mind, I shall discuss eight areas, upon which I believe an effective poverty reduction should be based.

Long-term political stability, based upon the principle of representation, would infinitely enhance citizen empowerment in Peru, while contributing to both opportunity promotion and security enhancement. Peru's populist tradition must be overcome by a broad and embracing regime with check and balances, which restricts the power of any one individual or institution. The World Bank believes that the state will deliver more effectively to the poor if public administration implements policies effectively and if it is accountable and responsive to users, through decentralization. To breach this deficit Peru must establish representative institutions that reach the people. Decentralisation will also enhance security as crises responsive mechanisms are maximised.

Enhancing the quality of the Peruvian civil service is also vital, by eliminating nepotism and cronyism, through merit based recruitment, as if promotion is unrelated to performance, staff have much less incentive to perform. Secondly, if elected representatives are overseeing their work and a free media is observing their decisions, efficiency is helped and corruption reduced.

It is clear that any defeat or substantial success against terrorism and the narcotics trade will greatly improve the circumstances of the Peruvian people. How this is done or if it is possible is an entirely different issue. In terms of terrorism, very harsh action is needed and it is important that the next government maintains suppression of the Shining Path. With regard to the drug trade, although this will antagonize the US, it would be worthwhile to partially legalise coca production and cocaine manufacturing, thus allowing possible taxation to accrue to the government rather than, certain generals in the army. And reduce violence in the Haullaga valley breeding confidence to investors, both in agriculture and tourism.

Although the policy of promoting an unskilled, low cost workforce to the international business community had been qualified since it's pure advocation in 1990, this is something from which Peru and Lima in particular could benefit. Empirical evidence, from Ireland in particular, has shown that labour export orientated growth, which is low skilled, can in time lead to a second generation of a more skilled labour force. This can contribute more to a value adding manufacturing base. Diversification into manufacturing goods, aimed at the US market, should be allied with greater diversification in agriculture. Any argument contrary to the benefits against agriculture production exporting does not mitigate against agriculture promotion but encourages cross-sectional diversification.

Another way in which poverty will be reduced is through the development of credit markets. Households can benefit from credit, savings and insurance services. They help to smooth consumption in the fall of sharp fluctuation in agricultural prices and yields, economic shocks and natural disasters, while on the other hand encouraging investment. Peru's government sponsored credit system aimed at meeting this need of the people, however proved not to be financially viable and the program collapsed under its high losses (WDR, 2000). According to this report, practices identified in the Bank Rekyat Indonesia should form the basis of credit programs in Peru. These include interest rates that fully cover cost, availability of well rewarded saving schemes, performance based compensation for staff, intensive staff training and low cost distribution networks.

Market encouragement policies have to be allied with redistribution policies in health and education to maximise the correlation between economic growth and poverty reduction. The equitable division of funding in this area has to be redressed. The education system should design programmes to meet the needs of the people. In rural Peru, academic courses should be augmented to include courses such as entrepreneurship, civics, agriculturally productive practices, asset and family management and practical skills. Such courses would prove advantageous to the children in question. I also believe an increased emphasis on English would be very advantageous, as it will complement the proposed tourism and multi-national manufacturing development. Allied to these changes, I would propose equal treatment and the encouragement of women in education. It has been shown that better-educated women are more able to communicate with their spouse about family size, use contraception more effectively and have higher aspirations for their children (World Bank, 2000).

Bibliography

Allen, Tim. (2000) *Poverty and Development into the 21st Century.* Oxford: University Press.

Beddis, R. A. (1982) *Peru: Studies in Development.* London: Walton on Thames

Crabtree, John. (1992) *Peru under Garcia: An opportunity Lost.* London: Macmillan.

Crabtree, John. eds. (1998) *Fujimori's Peru: The Political Economy.* London: Institute of Latin American Economy.

Goodhart, William. (1994) *Peru: Restructuring for Growth.* London: Euromoney Publications.

Lonergan, Eamonn. (1996) *Peru: The Next Step.* London: Euromoney publications.

Sachs, Jeffery. (1991) *Peru's Path to Recovery: A Plan for Economic Stabilization* Brookings Institute.

Todaro, Michael. (2000) *Economic Development.* New York: University Press

United Nations – Dept. for Economic and Social Information. (1997) *World Economic and Social Survey.* New York: United Nations Press.

Watters, Raymond. (1994) *Poverty and Peasentry in Peru's Southern Andes* Basingstoke: Macmillian.

World Bank. (2000/1999/1990) *World Development Report.* New York: Oxford.

World Bank. (1999a) *Peru: Improving Health Care for the Poor.* Washington D. C.: World Bank

World Bank. (1999b) *Poverty and Social Developments in Peru 1994-1997.* Washington D. C.: World Bank

Poverty & Development in LDCs: some policy suggestions

Ronan Lyons – Junior Sophister

The sheer extent of the problem of poverty in the world, in a time of unprecedented wealth, is very disturbing. Ronan Lyons discusses this issue. He opens with an evaluation of GNP as a measure of development, before discussing the issues of income distribution and the extent of poverty in LDCs. He then recommends nine pillars of policy initiatives, which would help to reduce levels of poverty in LDCs.

And it's true we are immune
When fact is fiction and TV reality
And today the millions cry
We eat and drink while tomorrow they die.
Bono, Sunday, Bloody Sunday (1983)

There's a world outside your window
And it's a world of dread and fear
Where the only water flowing is the bitter sting of tears...
Well tonight thank God it's them instead of you.
Band-Aid, Do They Know It's Christmas Time? (1985)

Economics, so far as they regard only inanimate things, serve only the low purposes of gain; but where they regard human beings they rise higher.
Langhorne, Plutarch (1770)

Introduction

The related issues of poverty, of development and of less developed countries (hereafter LDCs) are undoubtedly top of the planet's agenda in the 21st Century. That nearly 1.5 billion people live on less than 'a dollar a day' (Todaro, 2000), i.e. one in every four individuals, surely takes precedent over any other issue, political or economic. The eradication of poverty, although very much in the realm of possibility, still seems a distant dream. Although there are no quick-fix solutions to the problems of underdevelopment and of poverty, this essay discusses the issues involved. First, it considers the merits and limitations of GNP as a measure of development, suggesting more inclusive alternatives. Next, the essay deals with the issue of income distribution and the nature and extent of poverty in LDCs. The following section proposes policies that would increase the quality of life for the poor of the LDCs, based on the theoretical and empirical findings of the earlier sections. The final section summarises the findings.

GNP and the measurement of development

With the growth of development economics and the establishment of economic development as the goals of states, it is important, as Langhorne noted, not to forget the end in the midst of so many means. Development is the process of improving human beings' quality of life (Todaro, 2000). It implies a high physical quality of life for all (Ray, 1998), self-esteem and freedom to live one's life as one chooses (Todaro, 2000). Although the ideal society comprises more than merely each having enough income, this is the base on which such a society can be achieved. Consequently, material well-being has become the focus for economists and policymakers (Ray, 1998). Chief among the 'vital statistics' bandied about is Gross National Product per capita per annum (hereafter GNP), which is the total amount produced by an economy in a year, divided by the total number of people living in that economy. This varies from country to country, with West European countries, North America & Japan being the 'richest' countries in the world under this measure, while the poorest countries are located in sub-Saharan Africa, Latin America and Asia. It is this latter group that has the unenviable tag of 'Less Developed Countries'.

What are the advantages of using GNP as a proxy for development? It seems logical that if, per person, national income is bigger, people have greater means with which to ensure their quality of life. Literature shows that per capita income is positively related to a wide range of quality of life indicators, such as civil liberties and democracy (Easterly, 1999). As Easterly notes, wealthier is healthier. Nonetheless, when Easterly (*ibid.*) applies different methodologies for effects fixed to a country and for first differences, to correct for cross-sectional distortion and reverse causality, very few indicators showed a consistent robust positive relationship with GNP growth[1]. To summarise, the rationale behind using GNP was simplistic: richer countries have better quality of life indicators, so the poorer countries should become rich and the quality of life would follow. The approach implicitly assumed that aggregate economic forces could positively affect development outcomes (Ray, 1998).

[1] While indicators such as life expectancy showed no positive relationship, Easterly also found no relationship between crime, racial tensions or separatist movements and income, although pollution and corruption increased with income, even accounting for fixed effects (*ibid.*).

Problems with the usage of GNP as a proxy for development arose in the 1960s and have persisted. Firstly, GNP comparisons in their crude form reflect the vicissitudes of the exchange rate market, a market not known for the explicability of its trends. This has been shown by the famous 'Big Mac Index', which shows price variance between countries of a good with similar input costs in all countries. It shows the value of many LDCs' currencies to be underestimated. Economists have developed the Purchasing Power Parity (PPP) theory to overcome this problem. PPP estimates, for example, showed both India's and Nigeria's 1997 PPP GNP to be between three and five times as great as the ordinary GNP figures (Todaro, 2000).

Another important criticism of GNP as a measure of development is that it always places an unequal weighting on the richest quintiles of the population. If the richest 20% control 60% of GNP and the poorest only 5%, then GNP growth intrinsically places a regressive weighting of these percentages on the income growth of those quintiles. Consequently, a government aiming to maximise GNP growth will rationally choose to maximise the growth rate of the richest quintile's income (Todaro, 2000). This can be compensated for. Depending on the social welfare function, a utilitarian would place an equal weight of 0.2 for each quintile's income growth (as opposed to 0.6 and 0.05 in the raw GNP measure), while a Rawlsian weighting system would place greater importance on the growth of income of the poor, and less on the rich (perhaps reversing the raw weightings, so that the poorest account for 0.6).

Even if we change GNP to account for PPP and weighting towards the poor, problems remain. GNP shows no indication of income distribution or of poverty. It is possible that an island of ten people could be a statistically rich island, but in truth all the income is in the hands of one and the other nine live in absolute poverty. In many LDCs, something less extreme but showing the same trend exists, as will be discussed later. Secondly, many 'bads', such as the destruction of forests or cleaning up pollution[2], are implicitly included as goods in GNP, as they constitute the consumption of resources. Thirdly and conversely, many transactions necessary for the survival of the poor, such as subsistence farming, go unreported. Although they are critical for the well-being of many, they are left out of GNP measures. It is estimated, for example, that up to 20% of India's economy is in the 'informal' sector (Ray, 1998).

[2] Although cleaning up pollution itself is a good, an economy that has to spend $100m on cleaning up after polluting firms has forgone the opportunity cost of, say, infrastructural projects that could improve quality of life, had the pollution not occurred.

What are the alternative measures of development, then, given the shortcomings of GNP? Many alternatives stem from Morris' Personal Quality of Life Index (PQLI) of the 1970s (Easterly, 1999). One of the best known of these is the UN's Human Development Index (HDI). This incorporates figures for GNP (adjusted after $5000 because of the principle of diminishing marginal utility), life expectancy at birth (thus including infant mortality rates) and levels of education (both literacy and school enrolment) into a measure of the quality of life in a particular country. Note that GNP is still used as a fundamental part of the measure, and thus remains central throughout the discussion. The problem with devising such measures is the abstract nature of many quality of life indicators, e.g. the quality of government, feelings of self-worth/safety. In this regard, the attempts by Morris, the UN, the New Economic Foundation *et al.* are to be welcomed as bringing an accurate measure of development closer to reality.

Income Distribution & the Nature and Extent of Poverty

One of the limitations of GNP discussed earlier was that it fails to differentiate between different distributions of income, and hence often hides the extent of poverty. For a given level of income per capita, a more unequal income distribution implies more in poverty. Size distribution of income shows total incomes of all households/individuals, regardless of the income source (Todaro, 2000). Three common measures are derived from this. Firstly, there is a simple ratio of the income shares of the bottom 20% to the top 20%. In a perfectly equal society, this ratio would be 1:1. In reality, the ratio shows much variation, 4:98 in India (Deininger & Squire, 1996), but 27:1 in Paraguay (World Bank, 1998).

The second measure is the Lorenz curve. It shows the cumulative percentages of population and of national income. On the x-axis, the cumulative shares of national income are shown. Cumulative population is depicted on the y-axis. A perfectly equal society will have a Lorenz curve equal to the 45° line from bottom left to top right of the box, i.e. the poorest 40% of the population have 40% of national income, etc. However all societies' Lorenz curves lie to the right of this line. The further right the Lorenz curve is, the more unequal the income distribution is. Nonetheless, not all Lorenz curves are comparable. They can intersect, and therefore it is not always possible to say which income distribution is preferable.

The final measure stemming from size distribution of income is the Gini coefficient. It is the total of absolute differences between all pairs of incomes,

divided by the population squared and mean income (Ray, 1998)[3]. Graphically, it is the ratio of the area between the Lorenz curve and the 45° line to the total area under the 45° line. The smaller that ratio, the more equal the distribution in a society. There is no obvious relationship between income levels and the degree of inequality in LDCs (Todaro, 2000; Ray, 1998; Deininger & Squire, 1996). Although Kuznets' famous inverted-U hypothesis seemed to show that inequality increased at first before decreasing as development continues, Deininger & Squire (1996) found no such curve in over 90% of countries studied. Easterly (1999) finds evidence that the bottom quintile's share of income improves with growth.

The discussion above assumes that by reducing inequality, society is made better off. Is this a reasonable assumption? After all, economists from Mill to Johnson have argued that a country should worry first about growth before moving on to the issue of equality (Sundrum, 1990). Karl Marx, for example, wanted capitalism to bring society as far as it could, before communism could be successful in redistributing. This assumes that a trade-off exists between an economy's growth and equality of income distribution. For example, some argue that an unequal distribution will lead to a higher savings rate among the rich, increasing investment in an economy and causing higher growth. In essence, the argument is that governments should not redistribute, and should instead focus on maximising growth, leaving the benefits to trickle down to the poor. Apart from the limitations of growth maximisation as a tool combating poverty, as discussed earlier, there is much evidence to suggest that such a trade-off need not exist.

Ray (1998) cites two reasons for minimising inequality. Firstly, there is the philosophical justification for greater equality, as expounded by Rawls. Given the choice, and not knowing the outcome, people would choose a society with an equitable income distribution over an unequal one, because of risk-averse human nature. At a basic philosophical level, an equal society is more appealing to live in. Furthermore, those who are altruists would be aware of the negative utility effects of seeing people starving in the streets or on TV. It is rational to want to minimise these effects, by reducing inequality.

Secondly, regardless of this, inequality itself tends to impact on a society's economic performance. Ravallion (1999) has shown that 'if inequality is sufficiently high, countries which would have very good growth prospects at low levels of inequality may well see little or no overall growth' (p.10). Also, if more people are

[3] Namely, $G = (1/2n^2\mu)\Sigma^{m}_{j=1}\Sigma^{m}_{k=1} n_j n_k |y_j - y_k|$

involved in the economic markets, participation in development will be greater. Rather than there being a trade-off between growth and inequality, it seems that the opposite is true. Datt & Ravallion (1996) note that the promotion of growth and the reduction of poverty were, in general, positively affected by the same variables. There is also evidence to suggest that in democratic societies, there is a positive relationship between inequality and redistribution (although the median voter hypothesis seems inadequate to explain this) (Milanovic, 1999). This means that societies will, if given the chance, correct for greater inequality while still aiming to grow economically.

What, then, is the typical distribution of income in LDCs? Bearing in mind the earlier caveat that there seems to be little relation between income levels and inequality, we must proceed cautiously. Globally, the richest 20% of the world controlled 85% of income in 1991, 65 times that of the poorest 20% (UN Development Program, 1994). This enormous disparity has grown since 1960, and seems unlikely to recede in the short-term. In individual countries, the disparity is not as great. The regional examples of inequality that follow are taken from Deininger & Squire (1996), who trace income inequality over the second half of the 20th Century.

In Africa, the Côte d'Ivoire has an average Gini coefficient of 39.18, based on studies in the 1980s. Inequality is relatively unpronounced, with the ratio of income of the top quintile to the bottom quintile (hereafter 'quintile ratio') at 7.17. In Latin America, studies in Brazil reveal a much higher average Gini coefficient of 57.32. The quintile ratio confirms this, with the rich receiving 23.07 times that of the poor. In Asia, India stands out as the country with the most poor[4]. Nonetheless, its average Gini coefficient over 40 years of studies is 32.55. Its quintile ratio of 4.98 is even lower than that of Germany (5.35). In general, inequality is highest in Latin America (the average Gini coefficient being 50.15). Average Gini figures for sub-Saharan Africa, E. Asia and S. Asia respectively were 44.71, 36.18 and 34.06[5]. It is the outlier of Latin America that led Kuznets to his inverted-U hypothesis. Accounting for this, it may be possible that inequality decreases with growth.

[4] Over 50% of the world's poor live in India (Todaro, 2000).

[5] The corresponding figure for industrialised countries and high-income developing countries was 33.19, with Ireland and the USA having the most unequal quintile ratios of developed countries.

Who are the poor? While no single characteristic can be said to be true of all poor people in LDCs, certain groups are more likely to be poor than others. Todaro (2000) outlines three such groups. Firstly, about two-thirds of the world's poor live on subsistence farming. Therefore, the issue of rural poverty is of prime importance, particularly in Africa and Asia. Of the poor in the Côte d'Ivoire, for example, 86% live in rural areas; the corresponding figure in Thailand is 80% (World Bank, 1990). In Latin America though, there is a higher proportion of urban people who are poor.

Secondly, women make up the majority of the poor. Single-parent households headed by women are becoming more common around the world, and are more likely to be poor. The dependents of these women are likely to remain poor, too. Todaro (2000) notes that many of the development programmes in action in LDCs are aimed at men, an aspect of development efforts that needs to be addressed. Lastly, those who belong to indigenous groups in a country are also more likely to be poor. In Guatemala, seven-eighths of the indigenous population live below the poverty line (*ibid.*). There is an aspect of a vicious cycle at work, because such groups are often discriminated against and kept in poverty. This leads to conflict and often war, which in itself is one of the main causes of reinforcing poverty. In summary, poverty is a far-reaching phenomenon, and as, such any suggested solutions must reflect this fact.

Policy Suggestions for Combating Poverty

What follows is a discussion of nine different pillars of policy reform, which would work in tandem to improve the lot of the world's poorest. Firstly, the importance of agriculture and trade are stressed. Education is regarded as being crucial to improving productivity and to the fight against spiralling population growth. The merits and costs of a minimum wage are viewed in the light of findings on child labour. The role of governments in ensuring that competitive conditions prevail and the importance of asset redistribution and land reform are emphasised. By intelligent use of taxation and subsidies, and through correcting for failures in capital markets, the government is seen to have a vital role in improving the quality of life of its poorer citizens. The importance of the rural non-farm sector is also stressed, e.g. tourism and the construction of infrastructure. The entire discussion that follows assumes that the government in question is a benign one, having the eradication of poverty and the improvement of the quality of life as its main goals. This includes no discrimination against women or indigenous groups. If this is not

the case, political reform will be a necessary condition, before the real fight against poverty can begin.

Agriculture: Bearing in mind the high numbers of rural poor, the expansion of agricultural production must be seen as one of the key means of increasing the standard of life of the poor in LDCs, particularly in Africa and Asia. Datt & Ravallion (1996) noted that in India, increased agricultural yields reduced poverty. It must be recognised that in standard economics terms, LDCs must be viewed as having a comparative advantage in agricultural produce. Consequently, if encouraged, all those who live on subsistence farming can move to mixed farming, where some of what they produce is consumed by themselves, and the rest can be sold on to generate income (Drudy, 2000). This should also help diminish the extent of famines in drought, if subsistence farmers have some savings. Groups such as the EU must stop 'dumping', i.e. subsidising the export of inefficient agricultural produce to LDCs, who should be allowed to become self-sufficient in this area.

Trade: Related to the importance of the agricultural sector in LDCs is the role of international trade in increasing the standard of living. Although many are quick to criticise the 'developed' countries and 'Bretton Woods institutions' for trading when it suits them, there is evidence that in the last forty years, LDCs' domestic policies have hindered trade to a greater extent than foreign barriers (Amjadi *et al.*, 1996). This is not to say that OECD countries could not do more to improve the lot of LDCs, as they can certainly improve the international trading environment. Nonetheless, anti-competitive cargo reservation policies in many African countries, for example, have inflated international transport costs (*ibid.*). It is these freight costs that must be reduced if such countries are to exploit their comparative advantages.

Heckscher & Ohlin would argue that advantages these countries have in labour-intensive and agricultural products should be recognised internationally (Drudy, 2000). It is their competitive advantage, and specialisation should be allowed to occur. In this regard, their produce should have an equal footing with local products in OECD countries, with the abolition of protection, ceilings and quotas[6]. This should be done in conjunction with other forms of assistance from OECD countries, from financial to technical and policymaking.

[6] This is, of course, much easier said than done. Farmers' groups remain a disproportionately powerful interest group in developed countries and opening them up to fair competition requires political will, strength and tact.

Education: Another important pillar of policy initiative is education. The topic of education is intertwined with many other areas of poverty reduction. For example, increased educational standards would imply greater awareness of the problem of population growth. At a more basic level, education will increase productivity of a worker, and therefore his/her wages. This applies in both rural and urban areas, provided the education is relevant. Datt & Ravallion (1996) highlight the need for the 'development of human resources' to reduce poverty, particularly in rural areas.

There is debate about whether to increase the cost of schooling to encourage mothers to have fewer children, or to decrease educational costs, to increase the levels of education and thus productivity. On the former argument, it would seem to make more sense to educate the children not to have large families themselves, as opposed to using indirect means, which may not work effectively. Also, reducing the cost of schooling children makes it a more viable alternative to sending the children out to work (Canagarajah & Coulombe, 1997)[7]. To be effective, the system of education must be relevant and appropriate to the region. For example, education in rural areas must allow time for the children to help on the parents' farms. Once the cycle of education is begun, it is difficult to stop; educated parents send their children to school more so than those who have little or no education (*ibid.*).

The minimum wage: Many have called on LDCs to introduce or increase minimum wages. The principle of a minimum wage is noble. It aims to ensure that all those who work receive a reasonable wage for that work. However, many economists have always had reservations about distorting factor prices. The argument is that the introduction of a minimum wage increases the cost of labour, reducing demand and increasing unemployment, even though those who remain in work will be better off. There is some empirical evidence to support this.

Rama (1996) showed that the doubling of the real minimum wage in Indonesia in the mid-1990s had mixed effects. While it did increase average wage earnings by 10%, actual employment and investment decreased by 2% and 5% respectively. Rama found a link between firm size and the effect of the wage. Smaller firms were more likely to be unable to cope with the increase in wages, and the 'disemployment' effect was considerable in such firms. Although employment

[7] This links the issue in to the arguments for or against a minimum wage (see below).

did increase in some large firms, it is widely acknowledged that the reduction of poverty lies very much in the hands of smaller enterprises, based not just in the largest cities, but also around the country.

A further complication with regard to the welfare effects of a minimum wage has been highlighted by Basu (2000), who investigates the relationship between the adult minimum wage and child labour. Working from the premise that an improvement in adult working conditions should bring a decrease in child labour, his findings are not entirely encouraging. If the minimum wage increases adult unemployment, this can increase the supply of child labour and thus child employment, which can decrease adult employment in a multiplier effect.

In a situation where the minimum wage is greater than the critical wage for sending children into the labour market, and where the supply of child labour is less than the aggregate demand for labour (AD_L) per household, Basu makes an important finding. It is possible, he argues, for children to replace adults in unskilled parts of the market. He concludes that if an economy has multiple equilibria, using a minimum wage to curb child labour can have the opposite effect. In particular, he finds that LDCs are likely to have a higher supply of child labour for a given AD_L per household. Therefore, the introduction of a minimum wage is most likely to increase child labour in LDCs, the very countries that have to fight the problem.

The creation of competitive conditions: It is often argued that the labour market is highly regulated and that the presence of trade union power or of a minimum wage agreement distorts the price and thus the demand for labour. While this is true, relative factor prices can be changed through eroding the bias towards cheaper capital that exists in many LDCs (Todaro, 2000). Whereas labour prices are set higher than the market would otherwise have them, capital prices are often lower, because of investment incentives, capital subsidies, etc. The removal of such factor price distortions would tilt the relative price in favour of labour. Firms could then move along the production isoquant to a more labour-intensive combination of inputs.

Furthermore, efficiency in the marketplace must be promoted. The market must be assisted in the short run to ensure long-run benefits (Sundrum, 1990). This will involve improving market infrastructure, including transport, communications and education, so that fragmentation of the marketplace does not occur. The government, in short, must ensure that the creative function of markets, i.e. the

accumulation and efficient use of resources, is allowed to operate to the benefit of all (*ibid.*).

Asset redistribution: What is needed in many LDCs is a progressive redistribution of asset ownership. Any student of economics knows that the outcome of trade in the marketplace depends to a large extent on the initial endowment accruing to different groups. In LDCs, a small proportion of the population owns a large proportion of assets, meaning that the market itself will be unable to bring about a fair allocation. This is perhaps a relic of colonialism and has recently led to tensions in Zimbabwe, for example.

A major part of the solution will be land reform. The Latin American system of *latifundio* and *minifundio* is inappropriate in the fight to improve the standard of life of the rural poor. In order to reinforce the moves on agriculture and on access to credit, the typical tenant farmer in an LDC must be changed into a smallholder. This requires strong political will, similar to the British government's Land Acts of the late 19th/early 20th centuries with regard to Ireland. This was done on the basis of government compulsory purchase orders with a long-term loan system to the general populace. A parallel move in urban areas would be to replace informal moneylenders with a system of 'microloans' (Todaro, 2000).

Taxation & Subsidies: The debate continues as to whether governments should seek to minimise distortions in the market by taxing goods with low elasticities of demand, or follow the 'Robin Hood' philosophy and take from the rich to give to the poor. In LDCs, the overriding principle must be of progressive taxation, i.e. as income increases, the taxation system should take proportionately more of the marginal income. A policy of taxing luxuries and subsidising essentials would then be appropriate. However, the essentials are invariably local agricultural produce, on which farmers depend for their livelihood. A system of maximum prices may increase demand without any increase in supply and also lead to black market trade (Sundrum, 1990). Perhaps some LDCs could learn from India's example of agricultural price policy (*ibid.*). The government buys a part of the harvest and distributes to the poor at a low price. The rest is sold to the non-poor on the free market. This benefits both farmers[8] and the poor.

[8] Depending on the elasticities of demand, the average price after the government has bought some of the harvest may be higher than before.

Access to credit: The ideal of equality of opportunity must be promoted. If all have an equal start in life, a meritocratic system should occur. Consequently, education is very important in creating that equal base. A major barrier to bringing about equality of opportunity in LDCs is failure of the capital markets there. These missing markets restrict choice of job and the future of one's children. Because the average poor person in an LDC will have no collateral, a bank will be less likely to give the person a loan, as they have nothing to lose if they default. Ray (1998) points out that markets need an 'underlying social contract', where breaking loan repayments is seen as socially unacceptable. Essentially, though, people need initial wealth to set up an enterprise. If the capital markets fail, and inequality persists, the government must intervene with a loan system or capital market regulation to ensure greater equality of opportunity. This is related to the full development of human capital, as is education.

Rural non-farm sector: While the importance of farming in LDCs should not be ignored, the value of the rural non-farm sector is often underestimated. In Ecuador, for example, two-fifths of rural incomes come from this sector, and half of economically active women are employed in it (Lanjouw, 1998). Millions move from country to city every year. Therefore re-emphasising the importance of the rural economy, by showing that it is not just agricultural, can make the countryside a more viable option. This sector is 'strongly associated with higher living standards' and so should not be something that should 'wither away during the development process' (*ibid.*). It includes jobs in construction, manufacturing, textiles, crafts, commerce and tourism, and must be seen as having enormous potential. Rural infrastructural projects, such as irrigation schemes, will also provide employment for many, while developing the economy. This sector links rural areas to the cities and to international trade. Obviously, there is a link between this sector and the role of governments in offering loans at attractive rates, without which it would be difficult for many to set up their enterprises.

As can be seen from this list, which is by no means exhaustive[9], there are many interrelations between these pillars for development. It is obvious that the costs of implementing all of these would be huge, given their already strained resources. I would recommend two main measures to increase the disposable income

[9] A notable omission, for example, would be the need for an advanced health system to ensure high quality of human capital. This would work in tandem with education. Another area would be the ban of inappropriate exports to LDCs, such as armaments (see below) or powdered breast-milk substitutes, which lead to higher infant mortality.

of LDCs. Developed Countries, the IDA and the World Bank must alleviate the debt burden, by postponement or cancellation or existing service and debt. While many are anxious that if these countries are allowed to default once, they may try it again, the counterargument is that surely the lenders would prefer a current pause to yield a healthy debtor in the future[10] to a debtor permanently struggling to pay off even a quarter of the money it owes every year.

Even more importantly, spending on war needs to be greatly reduced to the bare minimum necessary for national defence. Spending on armaments, encouraged by developed countries, who benefit from the capital-intensive nature of their production, comprises too large a proportion of spending, when many die from starvation. $780bn or 2.6% of the world's GNP is spent on arms (Zarko, 1993). Countries in Africa spent up to 6% of their GNP in 1995 on arms and have increased their spending since 1997[11]. Reduction of military expenditure not only requires political will in the LDCs, but also in developed countries. These twin measures could serve to free up much needed resources to implement the policy suggestions above.

Conclusion

While I noted in the introduction that there are no 'quick-fix' solutions, the tone of this essay has been that this is no cause for development economists to abandon all work in despair. Development, as was discussed earlier, is all about improving the quality of life. GNP, as a measure of this, although positively related to many quality of life indicators, suffers several drawbacks. While its reliance on the vicissitudes of the exchange rate markets and its intrinsic regressive weightings can be compensated for, it hides distribution and the extent of poverty. It also includes many 'bads' produced in an economy, while leaving out often a high level of transactions that are necessary to the well being of the poor in LDCs. More inclusive measures, such as the UN's HDI, embrace such indicators as life expectancy and school enrolment ratios.

[10] Consider how Ireland now has little problem paying off its foreign debt, or how the USA did not ask for instant repayments on the Marshall aid it gave to Europe after World War II. Why should the LDCs be subject to different treatment?

[11] These data came from the SIPRI website; see online resources in the bibliography.

It was necessary, next, to discover the nature and extent of poverty, and this meant a discussion of income distribution. Size distribution of income yielded three measures. These were the ratio of the shares in national income of the poorest 20% to the richest 20%, the Lorenz curve and the Gini coefficient. No relationship was found between income levels and inequality. Furthermore, despite traditional arguments, there is evidence to suggest that there is no trade-off between equality and growth. Firstly, a more equal society is more appealing to live in, and secondly, inequality was found to adversely affect growth. In general, Latin America has the most unequal distributions, with Africa slightly better and Asia relatively unequal, even compared to developed countries. With regard to the nature of the poor, those more likely to be poor include those living in rural areas, women and indigenous groups.

The next section discussed what must be done to combat poverty. It assumed that the government is a benign force in the economy. Firstly, agricultural output must be increased. Policies favouring trade, both in LDCs and OECD countries, are needed. The use of appropriate education is central to improving productivity and fighting high levels of population growth. A minimum wage can adversely affect relative factor prices, levels of employment in small firms and the supply of child labour. Governments must ensure competitive conditions in markets. The importance of asset redistribution and land reform should not be underestimated. Governments can effect increases in the quality of life through intelligent use of taxation and subsidies. Failures in capital markets need to be addressed. Lastly, the rural non-farm sector must be seen to have great potential in increasing incomes. Funding for such projects should come from a relaxation of foreign debt burdens and a reduction of military expenditure. Perhaps in this way the less developed countries can hope to achieve vastly improved standards of living, so that the dream of eradicating poverty will not seem so distant.

Bibliography

Amjadi, A., U. Reincke, & A. Yeats (1996) "Did external barriers cause the marginalisation of sub-Saharan Africa in World Trade?" World Bank online (see no. 3 below).

Basu K. (2000) "The Intriguing Relationship between Adult Minimum Wage and Child Labour" World Bank online (3).

Canagarajah, S. & H. Coulombe (1997) "Child Labour & Schooling in Ghana" World Bank online (3).

Datt, G. & M. Ravallion (1996) "Why have some Indian states done better than others at reducing rural poverty?" World Bank online (3).

Deininger, K. & L. Squire (1996) "A New Data Set Measuring Income Inequality" World Bank Economic Review (Vol. 10 No. 3)

Drudy, P.J. (2000) lectures in 'Economics of Less Developed Countries'

Easterly, W. (1999) "Life during growth" World Bank online (3).

Lanjouw, P. (1998) "Ecuador's Rural Nonfarm Sector as a Route out of Poverty" World Bank online (3).

Milanovic, B. (1999) "Do more unequal countries redistribute more? Does the median voter hypothesis hold?" World Bank online (3).

Rama, M. (1996) "The Consequences of doubling the Minimum Wage: the case of Indonesia" World Bank online (3).

Ravallion, M. (1997) "Can high-inequality developing countries escape absolute poverty?" World Bank online (3).

Ray, D. (1998) "Development Economics" New Jersey: Princeton University Press.

Solimano, A. (1998) "Beyond Unequal Development: an Overview" World Bank online (3).

Sundrum, R.M. (1990) "Income Distribution in Less Developed Countries" London: Routledge.

Todaro, M. (2000) "Economic Development" New York: Addison Wesley.

United Nations Development Programme (1994) "Human Development Report: 1994" New York: Oxford University Press.

World Bank (1990) "World Development Report, 1990: Poverty" New York: Oxford University Press.

Zarko, A. (1993) "Analysing the Economic Impact of Military Expenditure across the Third World" Available online (4).

Online resources:

1) The Hungersite – Development Economics and Economic Development www.oxy.edu/~gsecondi/dev.html

2) Worldbank Group www.worldbank.org

3) Worldbank Group Policy Research Working Papers http://wbln0018.worldbank.org/research/workpapers.nsf/policyresearch?openform

4) ChetlyZarkowebsite http://people.mw.mediaone.net/chetly/home.html

5) United Nations www.un.org

6) Stolkhom International Peace Rearch Institute http://projects.sipri.se

Hedgehog Logic: The Problems of Econometric Methodology

Stephen Kinsella – Senior Sophister

Econometrics, with the right assumptions, would have us believe a hedgehog is really a hairbrush. Stephen Kinsella seeks to define a science and the paradigm of econometrics. He takes a philosophical look at how econometrics achieves its goal of the overriding aim of human betterment. He concludes that econometrics has to improve the scope of its date, if it is to help economics bring about a better world.

Hedgehog, n.: A small nocturnal mammal of the family Erinaciedae, having a pig like snout and a coat of spines, eating small invertebrates, and rolling itself into a ball for self defence. (Oxford Concise English Dictionary)
Hairbrush, n.: A brush containing bristles for arranging and smoothing the hair. (Ibid.)

Introduction

If a proposition be true, all the facts harmonise with it. - Aristotle

A hedgehog has bristles with which to defend itself against its predators. A hairbrush is a device used to alter the shape of one's hair. Yet, according to econometrics, a hedgehog is a hairbrush, given certain assumptions. These assumptions, their inadequacies, faults and weaknesses, I shall seek to elucidate in the course of this essay. After defining what I believe is a science, I shall attempt to briefly discuss the paucity of factual foundations for the erection of such pleasingly aesthetic mathematical models and esoteric theories, and move on to consider whether there is any truth to the charge facing us as economists- that of irrelevance.

The Structure of a Science

Jeffrey Donaldson (1997) states: "Economics is a moral science. It deals with normative issues upon which it seeks to give practical advice. It deals with *human betterment."*[1] It seeks, through objective understanding, to improve the human condition" (Donaldson, 1997, my emphasis). The set of tools that economic theory uses to test the waters of reality is known as econometrics, defined as "The systematic study of the application of statistical methods to the analysis of economic phenomena" (Kennedy, 1996). Econometrics has at its core the seed of its own

[1] It is my personal belief that economics is concerned with the issue of human betterment. What is the 'efficient allocation of resources', if it is not the satisfaction of every person?

destruction- the concept of "Reasoned Errors". (Huxley, 1981) At its most basic level, some 'dependent variable' Y is held to be functionally related to a set of 'independent variables', X, so that movements or variations of the latter give rise to predictable variations in the former.

Critics of econometric methodology, among them Nobel prize winning economists Leonie and Lucas, highlight the problem of the reduction of reality into these simple variables. The very fact that economists eschew detail and dimensionality to produce these variables disturbs them. Lucas states, "The theory upon which most econometric analyses are based presupposes the existence of stable parameter values" (rpt. Buurque, 1993, Chapter 2). This, he concludes, leads the social scientist astray as they hunt for proofs for their "foregone conclusions". (Leontieff 1985) The end result is a fallacious set of results, as Lord Keynes would say, "mere concoctions", arising from the "continued failure to obtain successful results by way of sticking to accepted theory" (Buurque, 1993).

Thomas Kuhn's classic 'The Structure of Scientific Revolutions' (1962) describes the development of a science, if that is what we wish to call economics, in terms of three distinct phases, which take place after the acquisition by practitioners of a field of study of a 'Paradigm' – a model or pattern of work that solves some, but not all, of the problems that those knowledgeable in the area deem acute. Our discipline, the development of the theory of supply and demand, the basic underpinning of much of economics, the implicit assumption of self-interest in all individuals leading to human betterment (and therefore society's) through the market system could be described as our central paradigm. Through this paradigm, suggests Kuhn, the profession would solve problems it would "scarcely have imagined" before its adoption, and would certainly never have undertaken without this "commitment" to the paradigm. Would Leon Walras have developed General Equilibrium theory without an implicit reliance upon the validity of the price mechanism as an information system?

Kuhn then turns to problems the scientist encounters during research within the paradigm, dubbed "normal science". Here, the scientist focuses on those problems the paradigm has not solved explicitly. Kuhn finds three distinct types of problem to be solved: first, that "class of facts that the paradigm has shown to be particularly revealing to the nature of things," second, "attempts to increase the accuracy and scope with which these facts are known," third, "those facts that can be compared directly with predictions from the paradigm theory." It is clear that the discipline of econometrics lies within the ambit of the second class of problems to be solved those efforts to articulate the paradigm with respect to the real world. In

this way, the efforts of practitioners are co-ordinated, as through the paradigm they move in the same general direction intellectually.

Problems within Econometrics

A beautiful theory killed by a nasty, ugly little fact. – Thomas Huxley

In econometrics, however, the problem arises when one attempts to verify another's findings, to reach agreement through repeatable empirical or experimental work. It has been remarked that few practising economists actually check each other's findings. Summers' (1991) challenge to the scientific community to find one theory disproved by econometric methodology resonates through my thoughts as I write this. If econometrics cannot do this, why does it provide "the underpinning for a vast area of economics"? (*The Economist*)

The economy is a "supercomputer" powered by our profit-maximisation motive, and we automatically solve the problem of the efficient allocation of all resources (Varian, 1998). So goes the mantra of the free market economist. The problem lies in the fact that real positive stripped down economics applies theoretically to some sectors of the highly advanced American private enterprise economy, the centrally planned Soviet system, the economy of an isolated primitive tribe, and those unfortunate inmates of concentration camps. When one, as an econometrician attempts to collect data from the real world, one is stifled by the amount of data one cannot access, whether because the field data has not been collected in a scientific way, has been collected for another purpose (for example, market research data) has not been collected at all. One is thus forced to estimate, approximate and then calculate one's variables by inferring their true value from proxies and surrogate data. Leontieff (1987) states that "in the study of a complex economy and the variables underlying it, indirect statistical inference, however refined methodologically, simply will not do."

Methodological Queries

Beauty is the first test: there is no permanent place in the world for ugly mathematics. – Godfrey Harold Hardy

Does this branch of economics, then, use technique and verbiage to cover up the fact that discipline it produces observations that are in and of themselves useless? Yes and no. There are some who believe that the subject is overly verbose; a regression model by simply adding a one period lag becomes 'dynamic', for

example. But there are also areas of economics that have been altered beyond recognition by the application of these techniques, most notably the area of mathematical economics, where a range of powerful tools have been developed that would yield tremendous results, should an "appropriate set of facts" appear. It has been remarked that, in this 'science' happenstance data can support confident causal conclusions. (Freidman et al, 1994) Because of the absence of control, unobserved variables may impact on one's data in ways one cannot measure.

Indeed, omitted variable bias is a severe problem within the discipline. It is the cause of the econometrician to find that the hedgehog is the hairbrush. By leaving out other important factors, either because they are unknown or unknowable, the regression will see that one is very strongly related to the other, in this case through the common factor of bristles. The econometrician must also contend with reverse causality – In what direction does one variable affect the other? In my example, if the hedgehog had bristles before the hairbrush, would that affect the outcome of the test? The problem of data mining is rampant in the discipline, heuristically looking at any favourable trends in the data, and rationalising their use as predictive elements, just because they happen to fit the user's foregone conclusions. (The Economist) These lead the econometrician to doubt findings at all stages, the precision and robustness of the model they are using is a factor in the decision to use any econometric tool, but there is always the existence of doubt before proof. That is why one seeks to prove it in the first place.

The search for Truth: its role in Econometrics

A wise man once wrote "I maintain that Truth is a pathless land, and you cannot approach it by any path whatsoever, by any religion, by any sect" (Krishnamurti, 1929). The guru cited above was, in this writer's opinion, talking about Absolute Truth, the unknowable, and the ungraspable essence of the cosmos. Econometrics, by approximating Y, the 'true' line, and 'True Beta' (A beta coefficient is a measure of how well the other variables affect the 'True Y'), while knowing that it can never reach that line, or grasp it directly seems to suggest that Hinduism had an effect upon its founders. Truth is unknowable, yet we seek it regardless. What else is there to do?

Lawson (1997) writes: "It is the implicit goal of every science to seek the objective truth." Where is the happy medium? By adopting the rules of the econometrics paradigm, we resign ourselves to a career where we are sure that, in every situation, and for any data set, we will be unsure. Bertrand Russell, the great atheist philosopher of the early twentieth century provides a succinct and ironically

accurate solution – "All exact science is dominated by the idea of approximation" (Russell, 1932).

So is there a way forward from this point, given that it is our stated objective in economics to advance human betterment through the efficient allocation of scarce resources? It is important to recognise the faults of the practitioners in not gathering precise enough data. To be a relevant, vibrant science contributing to the sum of human knowledge, we must refine our method and procedures to ensure data is captured appropriately, safe in the knowledge that the technical sophistication exists within the discipline with the ability to investigate our social reality successfully.

Conclusion

Has econometrics failed in its stated self-definition of providing the systematic statistical proof or disproof of economic theories through investigation in the real world? Several of the authors cited above seem to think so. Few would argue that econometric models of the future are all they should be. Some, like Leontieff (1985), feel it is "unable to advance, in any perceptible way, a systematic understanding of the structure and operations of a real economic system." If one ascribes to the definition of the discipline supplied above, this would mean it has failed outright in its stated aims. But something must be done. There is a crisis of data gathering within the community. Efforts to expand the empirical and experimental nature of the discipline are now possible through the use of the Internet and computers. Larger and more powerful mathematical models have been a trend for many years. Let it continue. Econometrics may be no substitute for good sense - a hedgehog will never be a hairbrush - but as a set of guiding tools it may have enduring value.

Happiness does seem to require the addition of eternal prosperity.

– Aristotle (op.cit.)

Bibliography

Aristotle. (1996) *The Nicomachean Ethics*. Trans. Nicholas Rackham. London: Wordsworth Classic editions LTD.

Buurque, C. (1993) *The End of Economics*. London: Zed Books LTD.

Friedman, D. and Sunder, S. (1994) *Experimental Methods: A primer for economists*. Cambridge: Cambridge University Press.

Huxley, T.H. (1981) *Science and Culture and other essays*. Oxford: University Press LTD.

Kennedy, P. (1996) *A Guide to Econometrics*. London: Blackwell Publishers LTD.

Krishnamurti, Jiddu, (1929) *Krishnamurti*. Trans. L. Herber.

Kuhn, T.S. (1962) *The Structure of Scientific Revolutions*. Chicago: The University of Chicago Press.

Lawson, T. (1997) *Economics and Reality*. London: Routledge Press LTD.

Leontieff, W. (1985) "The problem of Quality and Quantity in Economics." *Essays in Economics*. Ed. Wassily Leontieff. London: M.E. Sharpe Ltd.

Summers, L. "The Scientific illusion in Empirical Macroeconomics." *Scandinavian Journal of Economics*. 93 (1991) rpt. *The End of Economics*.

The Economist. (30th July 1998) "The perils of prediction." from www.economist.com.

The Economist. (12th October 2000) "Econometrics Focus." from www.economist.com.

Varian, H. (1999) *Intermediate Microeconomis: A Modern Approach*. London: Norton & Co.

Weston, S. (1974) *Philosophy and Economic Prophecy*. Portland: William and Richards.

Irish Inflation: An Econometric Analysis

Michael King - Junior Sophister

Recently the EU Commission issued a censure of what they called "an expansionary Irish budget". Were they right? Michael King conducts an econometric investigation into some possible determinants of Irish inflation, such as British inflation and Irish government expenditure. He rejects the Commission's link between Irish government expenditure and Irish inflation, concluding that British inflation is more important.

Introduction

There's only one place where inflation is made; that's in Washington

\- M. Friedman, 1977

Unfortunately for once, we can rule out the Americans in attributing blame for the current bout of Irish inflation. With no control over monetary policy and Ireland now seen as the prototype modern small open economy, the cause of Irish inflation can draw little from the historical theories of inflation. We are subject to a different array of influences to the traditional price setting economy. Based on the inflation transmission mechanism, McAleese (1995) cites three principle sources.

1. EU inflation rate - of greater importance with the advent of a fixed exchange rate.

2. British inflation and Euro Pound exchange rate (the influence of the former may be dampened by Pound depreciation)

3. Prices of international factors of production.

So where does the EU reprimand on Irish fiscal policy come in to it. Assuming the Commission's problem is with Irish fiscal policy, rather than our market distorting corporate tax regime, is there significant evidence to back their criticisms?

The aim of the project is to use the ordinary least squares model to gain a contemporary understanding of the forces explaining Irish inflation. The X variables have been chosen to represent the different elements highlighted by McAleese (1995). Oil prices reflect the changing costs of international factors of production. British inflation represents to some extent the imported inflation view (recognising

that exchange rate appreciation/depreciation may in fact at times contribute more significantly). Secondly, Irish government expenditure, as a percentage of GDP, evaluates the validity of the commission's criticism. Allied to these, seasonality will be factored in an attempt to identify whether it is seasonally induced.

The Econometric Model

$$Y = \beta 0 + \beta 1 \text{ (oil prices)} + \beta 2 \text{ (British inflation)} + \beta 3 \text{ (Govt. expenditure as \% of GDP)} + \beta 4 \text{ (} 2^{nd} \text{ Quarter)} + \beta 5 \text{ (} 3^{rd} \text{ Quarter)} + \beta 6 \text{ (} 4^{th} \text{ Quarter)}$$

Variables

Dependent variable Y

Irish consumer price quarterly index data is taken from the CSO publication economic series. Due to the unavailability of a continuous index from 1988 to 2000, some re-basing was necessary. The data is used as a continuous series with 1989 quarter 4 as base quarter.

First Independent variable X1

The first explanatory variable is the average international crude oil prices taken from the International Energy Agency Oil Information Publication since 1984. The figure that will be used is the average export price from the seven-principle oil exporting regions in the world. Due to the delay in the transmission from higher oil prices into domestic inflation a lag as a result of reserve buffering, of 1Q, 2Q and 3Q's will be used to see if the correlation is more significant.

Second Independent variable X2

The British quarterly consumer price index, obtained from the UK national statistic organisation is the second independent variable.

Third Independent variable X3

The final principal explanatory variable that I have chosen quarterly issues, as a percentage of the GDP figure for the year the issue takes place, with the exception of 2001Q1 where the figure of 1999 is used for simplicity. These figures are also taken from the CSO economic series and CNP and Government expenditure is measured in current prices for each period.

Seasonal Variables

In common with most time series data, Irish inflation exhibits regular oscillatory movements or seasonal patterns. In order to identify these movements a dummy variable is used. If there is a seasonal pattern present the estimated differential intercepts $\beta 4$, $\beta 5$, $\beta 6$, are statistically significant. In order to avoid multicollinearity 3 dummy variables are used to isolate the effects of the 4 seasons. In this regression the final three quarters are regressed with respect to the first quarter. Quarter 1 is thus, used as the benchmark with a dummy value of 0, D2 has a value of 1 for the 2nd quarter and 0 for all the other quarters and so forth.

Omitted Variables

In attempting to replicate reality any model, will omit variables and this model is no different. From the open economy school of thought the two key variables omitted are EU inflation and the appreciation/depreciation of the Euro, the Punt prior to 1998 against the Pound Sterling. Others include wage inflation and credit expansion.

Expectations

I expect to see a positive and significant relationship between with oil prices and British inflation but I am unsure as to the nature of the relationship between Irish inflation and governmental expenditure as a percentage of GDP. In terms of seasonality, I suspect that the final quarter will show the highest seasonal fluctuations.

Procedure

There are many econometric models available that can be used to estimate the correlation between variables. Through the Microfit software programme, I will use the ordinary least square model to estimate the population parameters. From the estimates I will construct a line of best fit.
The OLS model will yield a relationship between the variables by estimating the size and sign of $\beta 0$, $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$, and $\beta 6$.

Evaluation

The evaluation shall deal first with the multiple regressions, followed by an examination of individual regression result. After lagging X1 for 1Q, 2Q and 3Q's it was found to make no difference, hence no lag was used.

Multiple Regression

The OLS line of best fir is as follows:

Y = 41.1288 - 0.906X1 + .5049X2 – 0.0032X3 – 0.4798D2 + 0.0295D3 + 0.1577D4

Independent Variable	Coefficient	T-Statistic	Probability
A	40.3659	12.5824	[.000]
X1	-0.024923	-0.53327	[.596]
X2	0.50714	39.5866	[.000]
X3	-0.10175	-0.51388	[.610]
D2	-0.04798	-1.1536	[.255]
D3	0.295	0.070724	[.944]
D4	0.1577	3.2486	[.002]

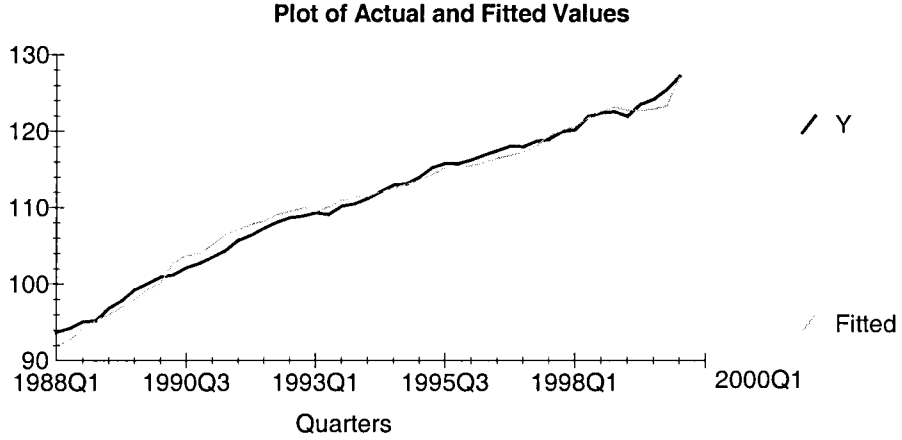
Analysis of Explanatory variables

The R^2 value of the multi-regression model is very close to the upper boundary of 1. It stands at 98.821% and indicates that the model is a very good fit. The adjusted R^2, R-bar squared is a less biased measure than R^2 in this case is still a very high 98.65%. In terms of structure, I will consider firstly the principal explanatory variables before discussing seasonality. X2 is the only explanatory variable that is in the multi-regression that is significant at the 1% or 5% levels. As for the coefficient on each X variables, there is as expected a positive and large correlation with British inflation. Counter intuitively there is a negative yet minimal relationship with crude oil prices which is significant at the 10% level. Regarding X3 we find a negative and minimal relationship but this relationship is not statistically significant at any level.

Seasonality

The β-coefficients indicate the direction the final 3 quarters inflation take with respect to the first quarter. We can see that inflation is lowest empirically in the second quarter rising to a peak in the pre-Christmas fourth quarter. Christmas consumer spending may explain this but so to might traditionally significant higher

government expenditure in the final quarter, but in the context of the results of the model this can only be described as conjecture. Only the 4th quarter is significant at any level of significance, whereas an R2 of .0698 (when the seasonal dummies are regressed alone) indicates that seasonality is not overall in any way significant in explaining changes in Irish inflation.



Single regression.

It appears that there exists high overall explanatory powers in the model. However, it is important to evaluate what individual explanatory powers X1, X2, X3 have in case multicollinearity has undermined the high R^2.

Analysis

From these results it is clear that British inflation has a more significant effect on my Y variable than X1 and X3. The simple regression indicate that X2's British inflation is the only explanatory variable within the 10% significance levels, significant at the 1% level. Interestingly the R^2 for the single regression of X2 is only marginally less than for the multiple regression at 98.396%, indicating that British Inflation can claim most of the models explanatory powers.

Independent Variable	Coefficient	T-Statistic	Probability
A	110.3308	16.7484	[.000]
X1	0.0325	0.089543	[.929]
Independent Variable	Coefficient	T-Statistic	Probability
A	38.522	28.3548	[.000]
X2	0.51134	53.7015	[.000]
Independent Variable	Coefficient	T-Statistic	Probability
A	152.4019	21.7343	[.000]
X3	-5.2347	-5.9797	[.000]

Multicollinearity

Multicollinearity is always a possibility in multiple regression analysis. It refers to the existence of more than one exact linear relationship among some or all the explanatory variables in the regression model. In the multi-regression model, significant multicollinearity is indicated by the high R^2 allied with insignificant β coefficients. To investigate this further I regressed each of the X variables on each other. Intuitively there should be significant collinearity between oil prices and British inflation with negligible collinearity between these and Irish government expenditure.

When I regressed X1 or X2 I found R^2 to be .527, quite high and anticipated. X1 and X3 yielded on R^2 of .00147, almost no collinearity. Interestingly a strong negative relationship was found between British inflation and Irish Government expenditure as a percentage of GDP. Thus multicollinearity undermines the results from the multi-regression.

Although my OLS estimators are still best linear unbiased estimator (BLUE), the existence of multicollinearity between X1 and X2 will result in those independent variables having very large variable and covariances, which makes precise estimation more difficult. My predications for each of the three coefficients were as follows.

Predictions vs. Results

Variables	Prediction	Result
Y and X1	Positive, possibly lagged	Slightly greater than 0, but not significant
Y and X2	Positive & significant	Positive and significant
Y and X3	Unsure	Negative and significant
Y and Seasonal Dummies	4th Q of greatest positive influence	4th Q of greatest positive influence

Statistics

The t-statistic measures the ratio of the parameter estimate to the standard error: 'an estimate of a parameter is statistically significant if the t-statistic associated with it causes us to reject a particular significance level, the hypothesis test'. It allows us to test the hypothesis that the coefficients equal to zero.

$$\mathbf{H0: \beta1=0, \beta2=0, \beta3=0, \beta4=0, \beta5=0, \beta6=0}$$
$$\mathbf{H1: \beta1\neq0, \beta2\neq0, \beta3\neq0, \beta4\neq0, \beta5\neq0, \beta6\neq0}$$

In the multiple regression, only X2 was found to be significant at the 10% 5% and 1% but this allows us to reject the null hypothesis, as all coefficients don't equal zero. In terms of the single regressions, both X1 and X3 are significant at the 1% level. Hence H0: $\beta1=0$, and H0: $\beta3=0$ can be rejected but H0: $\beta2=0$ must be accepted. Of the seasonal dummies only D3 is significant and only at the 10% level.

F-statistic

The F-statistic evaluates the combined significance of all explanatory variables. The F-statistic for this model is F (3,45) = 586.69 with negligible probability hence the null hypothesis can again be rejected. The overall model is significant.

Autocorrelation

If the assumption that the disturbances μ are random or uncorrelated is made, the problem of auto-correlation arises. There are several methods for the

detection of autocorrelation, of which the Durban Watson statistic is the most celebrated. It measures whether each observation is statically dependent on the previous term. In this model the Durban-Watson statistic is 0.458. As I have 45 and 6 variables the critical values for the model are to a 5% significance level:

$$dl = 1.189 \text{ and } du = 1.895$$

The band of inconclusiveness is small because of the number of observations. Since my DW statistic is below the lower limit, there is very definite evidence of auto-correlation or serial correlation. This is not an unusual occurrence in this type of time serial data. Although my OLS estimation remains unbiased in the presence of auto-correlation, it is not efficient. Thus, the t and F tests of significance are less legitimate and other tests may be required.

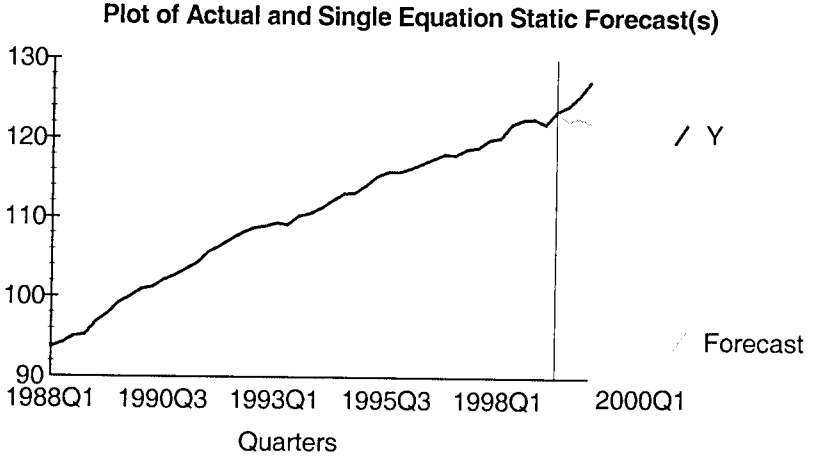
Hetroscedasity

If the assumption that all disturbances μ have the same variance is not satisfied there is hetreroscedasity. Hetrroscedasity does not destroy the unbiasediness and consistency properties of my OLS estimator but it would no longer be minimum variance or efficient. Unfortunately with a 29.2%, statistic, I cannot rule its existence to a 90% or 95% confidence level.

Forecasting

A desirable quality of such a model is the ability to forecast the future direction of ones variables. In order to test my model, I omitted the last 3 quarters data and re-ran the regression. The results that I obtained for the multiple regression model were very poor underestimating greatly. However when I omitted the seasonal dummies the forecasting improved significantly. This indicates that seasonal factors in 2000 will be of greater irrelevance. The results omitting the seasonal dummies are as follows:

Observation	Actual	Prediction	Error	S. D. of Error
1999Q3	124.16	122.3067	1.8533	1.0852
1999Q4	125.41	122.7332	2.6768	1.1158
2000Q1	127.18	122.1166	5.0634	1.193



As the model forecasts further into the future, it increasingly underestimates Irish inflation. The principle reason for this may be the Euros depreciation against the pound and the dollar over this period. Thus the main causes of inflation over this 2 periods and to the end of 2000 is omitted form the model. The model predicts negative inflation from 1999Q2 to 2000Q1, thus current Irish inflation, which began in this period, appears to be unexplained by the model.

Summary and Policy Recommendations

Firstly, the model suffers from auto-correlation and hetroscedasity may also be a feature. The model seems to be a very good fit but further investigation uncovers multicollinearity between British inflation and Oil prices and surprisingly British inflation and Irish Government expenditure as a percentage of GDP. Multicollinearity will always undermine econometric analysis, in particular with highly integrated macroeconomic data, nevertheless important conclusions can be drawn.

Independently, British inflation largely influences Irish inflation, government expenditure as a percentage of GDP has no significant correlation, and most surprisingly oil prices have a negative relationship that is statistically significant at the 10% level. Although the period of analysis ends in 2000Q1 the Commission had made overtures to the Department of Finance about fiscally

generated inflationary pressures prior to this. From my model, it can be claimed that there was no basis for this and this is unlikely to change into till the end of 2000 and into 2001. Thus rendering unfounded the current arguments against the expansionary nature of Budget 2001.

Seasonally, Irish inflation peaks in the final quarter, but this is not to be believed to be a result of any of the used variables, most likely increased consumer spending. The model forecasts a slight reduction in consumer prices in 2000, I believe this is a result of the omitted variable of Pound/Euro appreciation. Future considerations of Irish inflation should firstly consider, foreign inflation and Euro depreciation, before any analysis of fiscal policy and international factor prices, given the permanent nature of our fixed exchange rate with Europe and an interest rate out of our control.

In order to avoid the problem of auto correlation, which is generally associated with macro-economic aggregates, I would consider using the change in each series as my variables.

Bibliography

Gujarati, Damodar. (1995) *Basic Econometrics.* New York; London: McGraw Hill International.

Keenan, Brendan. (2001). *Irish Independent Feb. 1st* Dublin: Independent Media Group.

Mandala, G.S. (1977) *Econometrics.* London: McGraw Hill

McAleese, Dermot. (1995) *Secondary Policy Objectives* Dublin: Gill & Macmillan

McAleese, Dermot. (1997) *Economics for Business.* London: Prentice Hall Europe.

Quinn, T. et al. (1999) *Inflation Analysis* Dublin: Central Bank

Quinn, T. &, A. Mandsley (1996) *Forecasting Irish Inflation.* Dublin: Central Bank

Stewart, Jon. (1998). *Econometrics.* London: Prentice Hall Europe.

Modelling the real exchange rate between the U.S. and Germany

Edward J. O'Brien – Senior Sophister

Purchasing power parity (PPP) theory states that the exchange rate between two countries should exactly reflect the ability to buy goods in each country. Nonetheless, variations exist and Edward O'Brien sets out to model the real exchange rate and see whether PPP holds over longer time periods. Using co-integration and regression, he concludes that PPP fails to hold.

Introduction

The aim of this paper is to model the real exchange rate between the U.S. and Germany. Theory proposes that this real exchange rate should be equal to one. Therefore, the nominal exchange rate should be equal to the relative price level of the two countries. If this theory holds, the series being analysed should co-integrate, and have regression coefficients of plus and minus one.

I intend to investigate if this is in fact the case, by analysing the following series, over the period 1960 to 1998:

- The nominal exchange rate between the U.S. and Germany
- The price index for Germany
- The price index for the U.S.

The paper is organised as follows, with the necessary theory supplied as required:

- Theory of Exchange Rates and Purchasing Power Parity.
- Econometric Theory.
- Methodology and Discussion.
- Conclusion.

It should be noted that all data used was taken from *International Financial Statistics*, and analysed using *E-Views-3*.

Theory of Exchange Rates and Purchasing Power Parity

The theory of Purchasing Power Parity (PPP) states that the exchange rate between two countries' currencies equals the ratio of price levels in those countries. This theory of PPP is more formally known as *absolute* Purchasing Power Parity. The theory of PPP, be it absolute or relative, can be expressed mathematically. Let P_{US} be the Dollar price of a reference commodity basket sold in the U.S., and P_{DM} be

the Deutschmark price of the same basket of goods in Germany. The theory of PPP predicts a Dollar/Deutschmark exchange rate of:

$$E_{t\ US/DM} = P_{t\ US} / P_{t\ DM} \qquad (1)$$

In equation 1, E_t represents the nominal exchange rate, and P_t the respective price levels. The *nominal exchange rate* is defined as the exchange rate between one currency and another, in this case Dollars and Deutschmarks. The theory of PPP, is based on the Law of One Price, which assumes that the real exchange rate is equal to one. The Law of One Price states that in competitive markets, free of transportation costs and official barriers to trade, identical goods sold in different countries must sell for the same price, when their prices are expressed in terms of the same currency (Krugman & Obstfeld, 2000). The *real exchange rate* is defined as the exchange rate between two currencies, divided by the ratio of the price levels in the two countries. If we let R_t be the real exchange rate, equation 1 becomes:

$$E_{t\ US/DM} = R_t (P_{t\ US} / P_{t\ DM}) \qquad (2)$$

Given the theory that $R_t = 1$, equation 1 and 2 are identical. However, the assumptions of the theory of PPP do not hold under empirical analysis. The reasons for this poor performance are obvious. The assumptions of the theories of PPP and the Law of One Price fail to hold in reality:

- Contrary to the assumptions of the Law of One Price, transportation costs and official barriers to trade do exist.
- Markets are not perfectly competitive.
- The commodity baskets measured in each country differ, and therefore, the price levels reported will not be comparable.

The *Big Mac* index is commonly used as a measure of PPP. This index shows that no two countries have a real exchange rate equal to one. In 1998, this index showed a price difference between Germany and the U.S. of $0.13 for a *Big Mac*.[1] Although this difference is small, it should be zero under the theory of PPP. So in general, one would not expect R_t, the real exchange rate, to equal 1. In fact, it should be equal to some constant value. Rearranging equation (2), the real exchange rate, R_t, can be expressed as:

[1] "The Hamburger Standard." *The Economist.* (April 11, 1998) p. 58.

$$R_t = E_{t\ US/DM}\,(P_{t\ DM} / P_{t\ US}) \qquad (3)$$

This paper aims to investigate these theories. Does the theory of PPP hold, or shall the empirical evidence be borne out?

Econometric Theory

Spurious regression can be a particular problem with time series data. This is where the regression results initially look favourable, but upon further investigation, become increasingly suspect. However, if two time series are co-integrated, regression results may not be spurious. To quote Granger, "A test for co-integration can be thought of as a pre-test to avoid 'spurious regression' situations"(Granger, 1986:226). A stochastic process is said to be *stationary* if its mean and variance are constant over time and the value of covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which the covariance is computed (Gujarati, 1995). If a time series is not stationary as defined above, it is a *non-stationary* time series.

Given two or more series, that are non-stationary or random walk stochastic processes, the linear combination of these variables might be stationary. Although the series may be trending upwards in a stochastic fashion, they seem to be trending together. More formally, if the regression residual of two non-stationary series is found to be stationary, then those series are said to be co-integrated.

These theories can be applied directly to the problem of real exchange rates. Firstly, I am interested in the changes over time in exchange rates and price levels. Therefore I have taken the natural logarithm of equation (3). I have also included coefficients.

By taking the natural logarithm, and rearranging, this equation becomes:

$$\text{Ln}\ E_{t\ US/DM} = \beta + \beta_1\ \text{Ln}\ P_{t\ US} - \beta_2\ \text{Ln}\ P_{t\ DM} \qquad (4)$$

Note: $\text{Ln}\ R_t = \beta$, a constant, since R_t is itself a constant.

However, this equation is a statement of theory. For regression, we must include an error term also. This gives us:

$$\text{Ln}\ E_{t\ US/DM} = \beta + \beta_1\ \text{Ln}\ P_{t\ US} - \beta_2\ \text{Ln}\ P_{t\ DM} + U_t \qquad (5)$$

Given this information, this investigation must focus on two aspects.

1. If the series Ln $E_{t\ US/DM}$, Ln $P_{t\ US}$, and Ln $P_{t\ DM}$, are non-stationary, or I(1), and we find that U_t is stationary, or I(0), then we can say the series are co-integrated. If this is the case, any regression we carry out may not be 'spurious'.

By rearranging equation (5), U_t is:

$$U_t = \text{Ln } E_{t\ US/DM} - \beta - \beta_1 \text{ Ln } P_{t\ US} + \beta_2 \text{ Ln } P_{t\ DM} \qquad (6)$$

If U_t is stationary, it is said to be mean reverting. That is, it is not trending upwards or downwards over time.

2. In regressing the model given by equation (5), theory suggests that the β coefficients will have an absolute value of 1. If this is so, equations (2), (3), and (4) will be valid, and theory of PPP will be correct. However, if these coefficients are significantly different from 1, it will suggest that this theory is invalid.

Therefore, I must test for co-integration, and then consider the regression results.

Methodology and Discussion.

The three series being considered can be found in the appendix A1 of this paper. The first operation was to take the natural logarithm of each observation of each of the three series. I then proceeded as follows:

Testing for Stationarity.

Stationarity can be tested by two methods. The first is a subjective visual inspection of the time series graph and its correlogram. The second is the unit root test. While I have included the time series graphs below, it is not easy to judge *by eye* if series are stationary or not.

Figure 1: A plot of the natural log of the nominal exchange rate between German Marks and US Dollars, over time

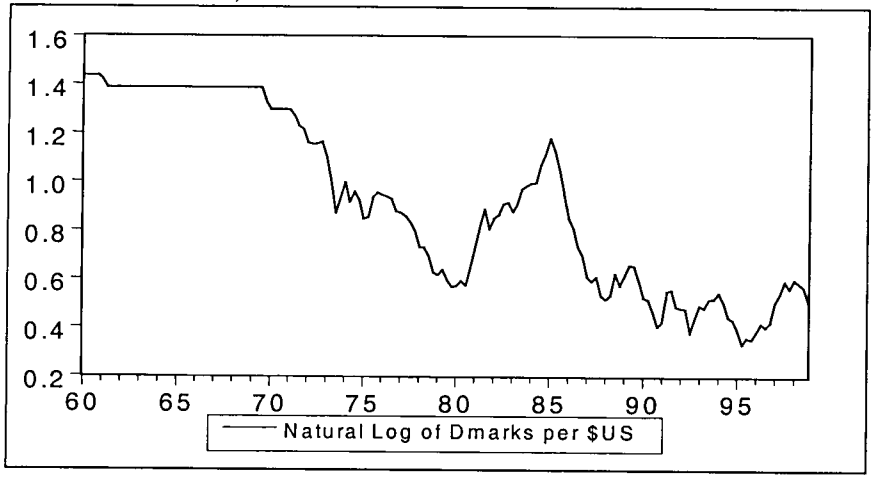


Figure 2: A plot of the natural log of the Consumer Price Index for Germany over time

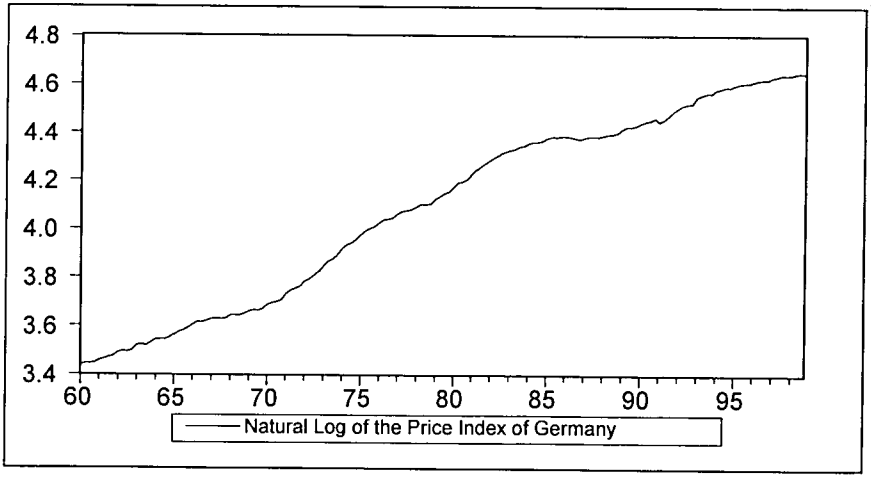
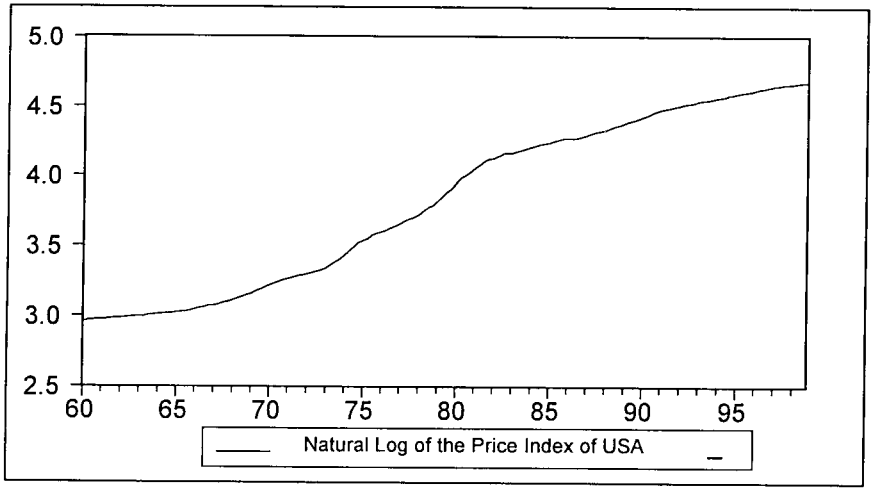


Figure 3: A plot of the natural log of the Consumer Price Index for the USA over time



Therefore, in testing for stationarity, I rely solely upon the unit root test. The unit root test is formulated as follows for the Augmented Dickey-Fuller (ADF) test:

$$\beta \text{ Ln } E_{t\ US/DM} = \beta \text{ Ln } E_{t-1\ US/DM} + \theta^{k}_{i=1} \beta_i \beta \text{ Ln } E_{t-1\ US/DM} + U_t \quad (7)$$

The hypothesis being tested is:

$$H_0: \beta = 1$$
$$H_1: \beta < 1$$

and the test statistic is:

$$t = \frac{\beta' - 0}{SE(\beta')}$$

Where β' is the estimate of β.

Using the ADF test, I determined the number of unit roots in the series. By testing first the *levels*, and then the *first differences* and so on, one can determine the number of unit roots. If the test fails to reject the test in levels, but rejects the test in first differences, then the series contains one unit root, and is integrated of order one, i.e. is I(1). In completing the ADF test, I included a constant term, but no linear

trend, and allowed the number of lagged first difference terms, k, to be initially 6.

For the first series, Ln $E_{t\ US\ /\ DM}$, the ADF table for both level and first differences are shown below (Tables 1 & 2). As can be seen in the level, the null hypothesis of a unit root fails to reject against the one-sided alternative, since the t-statistic is not less than (does not lie to the left of) the critical value. However, for the first differences, the null hypothesis is rejected, even at the 1% critical value. Therefore, we can infer that Ln $E_{t\ US\ /\ DM}$ is integrated of order one, i.e. I(1). Ln $E_{t\ US\ /\ DM}$ is a non-stationary series.

Table 1: Unit Root Test of Ln $E_{t\ US\ /\ DM}$: Level

ADF Test Statistic	-1.134934	1% Critical Value*	-3.4752
		5% Critical Value	-2.8809
		10% Critical Value	-2.5770

Table 2: Unit Root Test of Y: First Differences

ADF Test Statistic	-3.994102	1% Critical Value*	-3.4755
		5% Critical Value	-2.8810
		10% Critical Value	-2.5770

Applying the same test procedure to the Ln $P_{t\ US}$, and Ln $P_{t\ DM}$ series yields similar results. Ln $P_{t\ US}$ is rejected at the 10% critical value, and Ln $P_{t\ DM}$ is rejected at the 1% level. They are both found to be non-stationary series. The ADF tables for both these series are included below (Tables 3, 4, 5 & 6).

Table 3: Unit Root Test of Ln $P_{t\ US}$: Level

ADF Test Statistic	-0.936737	1% Critical Value*	-3.4752
		5% Critical Value	-2.8809
		10% Critical Value	-2.5770

Table 4: Unit Root Test of Ln $P_{t\ US}$: First Differences

ADF Test Statistic	-2.651080	1% Critical Value*	-3.4755
		5% Critical Value	-2.8810
		10% Critical Value	-2.5770

Table 5: Unit Root Test of Ln $P_{t\ DM}$: Levels

ADF Test Statistic	-1.416407	1% Critical Value*	-3.4752
		5% Critical Value	-2.8809
		10% Critical Value	-2.5770

Table 6: Unit Root Test of Ln $P_{t\ DM}$: First Differences

ADF Test Statistic	-4.195920	1% Critical Value*	-3.4743
		5% Critical Value	-2.8805
		10% Critical Value	-2.5768

Note: The full ADF reports are available in appendix A2.

Co-integration and Regression

Now that we know the three series are all I(1), we must estimate the regression equation, and then test the residuals for stationarity. This will indicate whether the series co-integrate or not.
The regression equation is:

$$\text{Ln } E_{t\ US/DM} = \beta + \beta_1 \text{ Ln } P_{t\ US} - \beta_2 \text{ Ln } P_{t\ DM} + U_t \qquad (5)$$

The estimation output table (Table 7), is shown below, as is its' graph (Figure 4). It should be noted that the regression equation used in E-Views was:

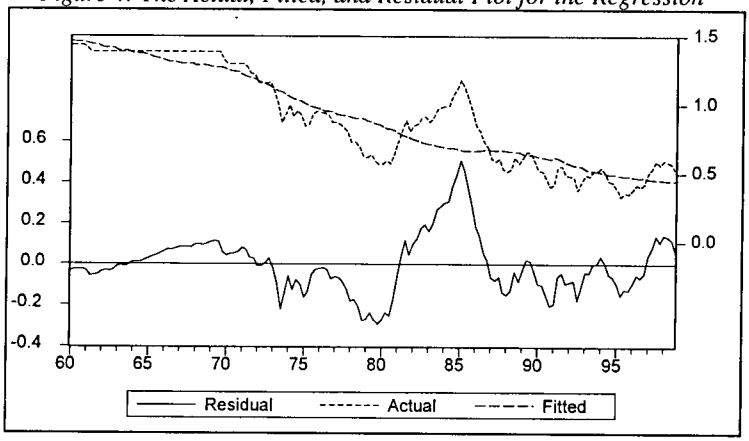
$$Y = C_1 + C_2X_{1t} + C_3X_{2t}.$$

This was done simply for convenience.

Table 7: The Estimated Regression Output

Dependent Variable: Y				
Method: Least Squares				
Date: 02/03/01 Time: 13:40				
Sample: 1960:1 1998:4				
Included observations: 156				
Y=C(1)+C(2)*X1+C(3)*X2				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	4.410775	0.463789	9.510300	0.0000
C(2)	0.028638	0.183868	0.155752	0.8764
C(3)	-0.881230	0.282791	-3.116183	0.0022
R-squared	0.844194	Mean dependent var		0.915815
Adjusted R-squared	0.842157	S.D. dependent var		0.360553
S.E. of regression	0.143246	Akaike info criterion		-1.029466
Sum squared resid	3.139461	Schwarz criterion		-0.970815
Log likelihood	83.29836	Durbin-Watson stat		0.097179

Figure 4: The Actual, Fitted, and Residual Plot for the Regression



For the co-integration regression, the value of R^2 is 0.844194. This is high and suggests a strong relationship between the variables.

The coefficient C (1) is simply the constant term. Coefficient C (2) is in fact β_1. Theory predicted its' value should be +1. As can be seen from above, its' actual value is 0.028638. The t-statistic value of 0.155752 fails to rejects the possibility that $\beta_1 = 0$. So one must assume a very real possibility that $\beta_1 = 0$. In fact one can be 87% sure that $\beta_1 = 0$.

The coefficient C (3) is actually β_2. Theory predicted its' value should be -1. As can be seen from above, its' actual value is -0.881230. The t-statistic value of -3.116183 rejects the possibility that $\beta_2 = 0$, even at the 1% level.

The Durbin-Watson test statistic reported is d = 0.097179. For 150 observations, with 2 explanatory variables, $d_L = 1.598$, and $d_U = 1.651$, at the 1% level of significance. Since d is less than d_L, we cannot reject positive serial correlation.

In order to establish the credibility of the multiple regression, it is worth carrying out single regressions, with the dependent variable regressed on each

independent variable. The individual regressions tell a similar story, to that of the multiple regression. A regression of Ln $E_{t\ US\ /\ DM} = \beta + \beta_1$ Ln $P_{t\ US} + U_t$ gives the below results (Table 9).

Again, the coefficient, expected to equal +1, equals only 0.22. The value of R^2 is high, at -0.859970. These statistics do not mirror those of the multiple regression. However, the D-W statistic is such that positive serial correlation cannot be ruled out, which confirms the results of the multiple regression.

Table 9: Single Regression Output, Ln $E_{t\ US/DM} = \beta + \beta_1$ Ln $P_{t\ US} + U_t$

Y=C(1)*X1				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.220533	0.010178	21.66694	0.0000

R^2 = -0.859970

The results from regressing Ln $E_{t\ US\ /\ DM} = \beta + \beta_2$ Ln $P_{t\ DM} + U_t$ are very similar. Here, the coefficient is just 0.22 also, with an R^2 of -0.499290. These results, quite different from those of the multiple regression, indicate a poor relationship between Ln $E_{t\ US\ /\ DM}$ and Ln $P_{t\ DM}$.

Table 10: Single Regression Output, Ln $E_{t\ US/DM} = \beta + \beta_2$ Ln $P_{t\ DM} + U_t$

Y=C(1)*X2				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.214134	0.008602	24.89337	0.0000

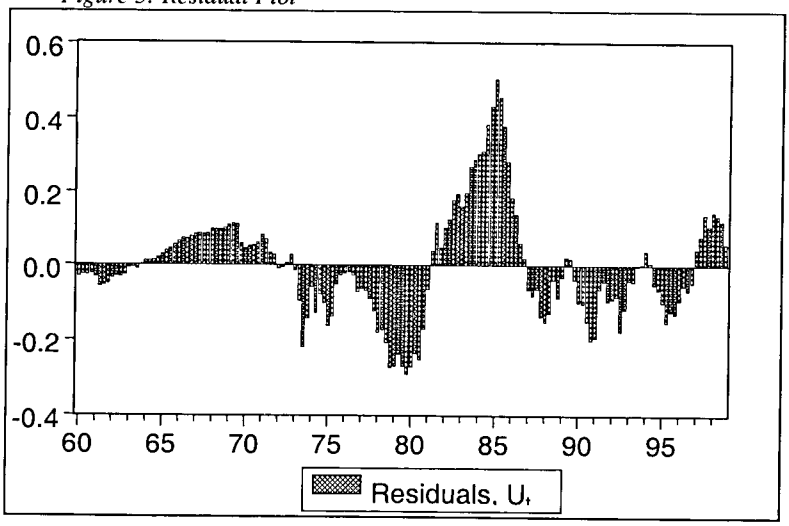
R^2 = -0.499290

Finally, multicollinearity was tested for by regressing, Ln $P_{t\ US}$ against Ln $P_{t\ DM}$. The results here are worrying. R^2 is a vey high 0.840701. This indicates a strong relationship between Ln $P_{t\ US}$ and Ln $P_{t\ DM}$, which will affect the multiple regression outcome. Having completed the co-integrated regression analysis, the next step is to evaluate the nature of the residuals.

The Residuals

Below is a graph of the regression residuals (Figure 5).

Figure 5: Residual Plot



As previously stated, if the series Ln $E_{t\ US/DM}$, Ln $P_{t\ US}$, and Ln $P_{t\ DM}$, are non-stationary, or I(1), and we find that U_t is stationary, or I(0), then we can say the series are co-integrated. Since it is now known that the three series are co-integrated, what remains is to test the residuals.

However, the ADF test as previously used, is only valid for unit root tests of a data series, and will be invalid if the series are based upon regression estimations. However, Engle and Granger have established a test for co-integration. It simply involves testing the stationarity of the regression residuals, but using a different set of critical values. In this context, the ADF test is known as the Augmented Engle-Granger (AEG) test.

The unit root test for regression residuals, or the co-integration test, is formulated as follows:

$$\beta U_t = (\beta - 1) U_{t-1} + \beta_t U_t = (\beta - 1) U_{t-1} + \theta_{j=1,2,\ldots,J} \beta_{t-j} \beta U_{t-j} + \beta_t \quad (8)$$

The hypothesis to be tested is:

$$H_0 : \beta = 1$$
$$H_1 : \beta < 1$$

And the test statistic is:

$$t\alpha = \frac{(p - 1)}{SE(p)}$$

Where p is the estimate of β.

The ADF, or AEG test statistic for the unit root of residuals is -3.049928. However, the critical value at the 1% level is approximately -5.0. This value is extrapolated from the values of appendix A4, since in this case, N=150, K=6. Note that N is the number of observations, and K is the number of lagged first difference terms. Although this value of -5.0 is approximate, it is so much larger than -3.049928, that the null hypothesis can be safely rejected. This implies the residuals are indeed stationary, or I(0), and that the series Ln $E_{t\ US/DM}$, Ln $P_{t\ US}$, and Ln $P_{t\ DM}$ are in fact co-integrated.

Conclusion

The focus of attention for the preceding section was twofold, concerning co-integration and regression. As introduced in early sections, the theory of PPP required that the three series concerned be co-integrated. I have shown that in fact these series are indeed co-integrated. Therefore, the regression results obtained for these time series should not be spurious.

Having established these facts, I then turned my attention to the regression. Initial results were mixed. While a high R^2 value was found, the regression coefficients were not +1 and -1, as theory would suggest. Upon further investigation, the regression results became doubtful. By regressing the dependent variable on the independent variables separately, the relationship seemed to fail. In the multiple regression a strong relationship was found to exist between Ln $E_{t\ US/DM}$ and Ln $P_{t\ DM}$. However, in the single regression, this relationship fails. The opposite is true of $LnE_{t\ US/DM}$ and $LnP_{t\ US}$.

The issues of multicollinearity and serial correlation were also considered. Results here indicate that multicollinearity is definitely a problem. The Durbin-Watson statistics for the regressions are such that I cannot reject the possibility of positive serial correlation in the residuals. Together, these results indicate that the multiple regression model is not a particularly good fit!

Given this information, what can I say about the initial model? Equation (4) is a statement of the theory of PPP. Since we now know that β_1 and β_2 do not equal

unity in absolute value, we can say that the theory of PPP fails in this case. If $R_t = 1$, $\beta_1 = 1$, and $\beta_2 = -1$, then equation (4), below would simply revert back to equation (3), proving the theory of PPP.

$$\text{Ln } E_{t\ US/DM} = \beta + \beta_1 \text{ Ln } P_{t\ US} - \beta_2 \text{ Ln } P_{t\ DM} \qquad (4)$$

Finally, this paper began with an attempt to discover if R_t was in fact equal to one. In other words, is the theory of PPP valid? Having discussed the empirical evidence, one did not expect this theory to hold, but nevertheless, the analysis was undertaken. The final result was to show that for the case of the U.S. and Germany, between 1960 and 1998, the real exchange rate was not in fact one. The theory of PPP fails.

Bibliography

Barro, R. (1997) *Macroeconomics*. 5th ed. London: MIT Press.

Granger C.W.J. (1986) "Developments in the Study of Co-integrated Economic Variables." *Oxford Bulletin of Economics and Statistics*. 48.

Gujarati, D. (1995) *Basic Econometrics*. 3rd ed. Singapore: McGraw-Hill International Editions

Johnston, J. & J. DiNardo. (1997) *Econometric Methods*. Singapore: McGraw-Hill International Editions.

Krugman, P. & M. Obstfeld. (2000) *International Economics: Theory and Policy*. 5th ed. Addison Wesley Longman.

MacGuinness, A. "Co-Integration and Tests of Purchasing Power Parity." *Student Economic Review*. 14 (2000).

Scanlon, P. "Imperfect Asset Substitutability & the Irish Experience in the EMS." *Student Economic Review*. 14 (2000).

Microsoft's share price and its determinants

Louise Owens – Junior Sophister

As many know, the US government has ordered that Microsoft split in two, to prevent the abuse of dominant market power. Louise Owens, in an econometric analysis, studies the effect of this court decision on Microsoft's share price, as well how the consumer price index and the Nasdaq affect the share price. She concludes that, while not the only factors, such external pressures play a large role in shaping Microsoft's success.

Introduction

In this project, I will attempt to show that a relationship exists between the share price of Microsoft and three independent variables. These variables are the NASDAQ 100 index, the consumer price index and the court case in which Microsoft was accused of anti-competitive behaviour. I will use a simple econometric model in my attempt to define a relationship between these variables and the share price of Microsoft.

Established in 1975, Microsoft Corporation has been a worldwide leader in software for personal and business computing. It was ranked number 5 in The Top Ten American companies in 2000.[1] Despite its global success, the year 2000 has proven somewhat dismal for Microsoft.[2] In April 2000, the world's largest software company was found guilty of using "anti-competitive means" to maintain monopoly power in PC operating-system software. Two months later, the firm was ordered to split into two companies. Naturally, Microsoft appealed against this ruling by Judge T. Jackson but, not surprisingly, its share price plummeted.

As a public company, Microsoft inevitably suffers from both macroeconomic and firm specific risk. The current downturn in the US economy, for example, will have a knock-on effect for multinationals and open economies alike. It is certain that Microsoft can do little to avoid macroeconomic factors, but it can protect itself against systematic risk. As such, Microsoft will diversify to ensure consistent increases in profits. Recently, Microsoft's Windows 2000 operating system has been performing less than expected, and so too has its Office 2000

[1] Fortune Magazine, February 2001. Rank is based on the votes received from all respondents across all industries. Microsoft fell 3 places from the previous year.

[2] Microsoft is a registered Trademark for Microsoft Corporation.

applications suite. These account for half of Microsoft's revenues. The current crisis for Microsoft is due to the risk of a slow down in the PC industry coupled with the shift from PC based to Internet based computing.

As with all companies, it is imperative to hedge against firm-specific risk, as shareholders do when selecting their portfolios. It was therefore no surprise to observe Microsoft's diversifying strategy to take advantage of the profitability increase of the Internet.

The challenge facing Microsoft is to penetrate the Internet sector, combating slowing applications revenues and avoiding the threat of break-up. Microsoft's plan is .NET. If successful, Microsoft's focus will have been diverted away from the PC and hopefully they will gain from the rising proliferation of non-PC devices such as smart telephones.[3] No doubt Microsoft will ensure that .NET will be best used on PC's running Windows creating demand for its powerful software, including of course Windows 2000. This strategy not only ensures a positive response to the growth of the Internet, but also insulates the firm in the event of its possible division into an operating-system company (which would own Windows) and an applications company (owning Office).

Econometric Analysis

The Model

Econometricians pride themselves on the ability to produce "good" estimators. We must meet certain criteria to guide our ultimate choice of preferred estimators. Measures of "goodness" used in this evaluation will be described within a certain number of criteria. The method of Ordinary Least Squares (OLS) was applied in Microfit, the computer package used for estimation. Equation 1 denotes the model applied in OLS analysis.

Equation 1: $$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3D+\mu$$

The Y term depicts the dependant variables and X depicts the independent variables. D represents the Dummy variable, the β's correspond to the co-efficient terms and μ represents the errors ignored in the regression.

[3] Pg 53, The Economist, January 6th – 12th 2001.

The Dependent variable:

The Y variable is the share price of Microsoft. It is the variation in the share price, which I will attempt to explain. I have chosen 20 quarterly observations from the second quarter in 1996 to the first quarter in 2001. I have also chosen three explanatory variables in my attempt to depict the variations in the share price of Microsoft, however there are variables omitted from my analysis. It is undisputed that there exists more than three factors determining the variation in the share price but it is not possible to analysis them all. Indeed, it is very probable that we are not aware of many explanatory factors.

Independent Variables:

X1-The NASDAQ 100 index

The Nasdaq Stock Market represents 100 of the largest non-financial U.S. and non- U.S. companies. It was established 30 years ago. It reflects Nasdaq's largest companies across industry groups, including computer hardware and software, telecommunications, retail/wholesale trade and biotechnology. Investors can participate in the combined performance of large household names from Microsoft to Amazon.com. The Nasdaq-100 Index is a modified capitalization-weighted index, which is designed to limit domination of the Index by a few large stocks while generally retaining the capitalization ranking of companies

Because Nasdaq-100 Index Tracking Stock reflects the collective performance of 100 companies, the impact of price fluctuations caused by a specific company development will be reduced for holders of Nasdaq-100 Index Tracking Stock. Nasdaq-100 Index Tracking Stock will still be subject, however, to risks specific to the performance of a few component securities that currently represent a highly concentrated weighting in the Nasdaq-100 Index.

X2-The Consumer Price Index

The Consumer Price Index is a widely used measure of inflation and used as an economic indicator. It represents changes in the prices of all goods and services purchased for consumption by urban households. Prices for the goods and services used to calculate the CPI are collected in 87 urban areas throughout the USA and from about 23,000 retail and service establishments.

X3-The Dummy variable

Dummy variables are a proxy for the explanatory variable of a qualitative nature. It is an artificial variable constructed to take the value of 1 when the event or qualitative phenomenon occurs and zero when it doesn't occur. The qualitative variable is given by the co-efficient of the related variable αD plus an error term. $Y = \alpha pD + \epsilon$ but when D = 1, the equation becomes $Y = \alpha + \epsilon$.

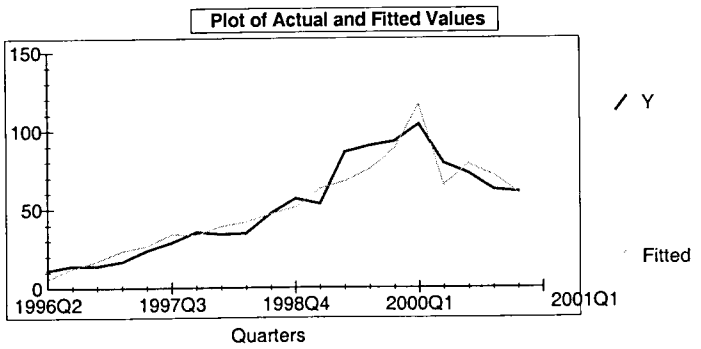
The Regression

Equation 2: $Y = -532.9793 + 0.019262X_1 + 3.4062X_2 - 43.4427D$ $R^2 = 0.91476$

Independent Variables	Coefficient	T-ratio	Probability
A (constant term)	-532.9793	-3.6444	0.002
X1	0.019262	4.7757	0.000
X2	3.4062	3.6461	0.002
Dummy variable	-43.4427	-5.3781	0.000

It is evident from the regression that each variable has explanatory power in illustrating the variation in Y. The effect of the court case on the share price of Microsoft was extremely significant as the coefficient of the dummy variable depicting the court case outcome is –43.4427. This means that the share price fell dramatically after the incident.

Regression of Y on the X variables



The Coefficient of determination R^2

The co-efficient of determination is representative of the proportion of the variation in the dependent variable by variation in the independent variable. It does this in a meaningful sense in the case of a linear relationship estimated by OLS (Kennedy, 1998: 13). It allows us to determine how our sample regression equation obtained best fits the sample observations, i.e. minimises the sum of the squared residuals. It is desirable to have a measure of "goodness of fit" of a sample regression equation estimated by OLS. The total variation in the dependent variable (Y) is the sum of the squared deviations of the dependent variable. The coefficient must be between zero and unity. The closer R^2 is to one, the better the fit. At the highest extreme value of 1, all the observations would lie on the regression line giving a perfect fit.

In my regression, the ratio of the explained variation to the total variation is 0.91476. This means that 91.48% of the variations in the share price of Microsoft can be explained by the three combined independent variables chosen for this regression. It can therefore be said that the estimated line fits the regression line extremely well and although it is not a perfect fit, it is clear that the model has explanatory power.

Durbin-Watson Statistic

The D-W *d* statistic is the ratio of the sum of squared differences in successive residuals to the residual sum of squares (Thomas, 1985). It is used to detect first-order correlation (autocorrelation). The DW statistic in my analysis was 2.0937.

The T-Test

The t ratio is the ratio of an estimate to its estimated standard error and is sometimes presented in parentheses in place of the estimated standard error (Thomas, 1985). In my regression X_1 X_2 and X_3 are all significant at the 1% level as $0.002 \leq 0.01$.

Multicollinearity

It is necessary to examine whether the explanatory variables are indeed independent. We can do this by checking for multicollinearity between the variables.

From my regression I obtained a high R^2 of 0.74502 between X_1 and X_2 suggesting a high level of correlation between them. When regressed on X_3, the R^2 was less significant at 0.38438.

The F statistic

The F statistic combines the effect of the individual t statistics. It is a test of overall significance instead of testing the significance of the estimated partial regression coefficients individually, that is, under the separate hypothesis that each true population partial regression coefficient was zero (Gujarati, 1995). As it is similar in nature to the correlation coefficient, I expected it to be quite high. The value of the F statistic was 57.2377, which is a high value.

Independent Variable	**Coefficient**	***t*-ratio**	**Probability**
A	6.4504	0.95251	0.353
X1	0.024143	7.5082	0.000
			$R^2 = 0.75798$
A	-625.2179	-4.8520	0.000
X2	4.1334	5.2491	0.000
			$R^2 = 0.60485$
A	46.3769	6.4802	0.000
X3	22.1156	1.3820	0.184
			$R^2 = 0.95926$

Conclusion

The U.S. is presently experiencing a down turn in the economy. For investors, slower economic growth means reduced expectations and increased uncertainty, quite a different climate from what they had become used to.[4] The collapse in consumer confidence after the court case is undoubtedly an integral factor in the fall of Microsoft's share price, which plummeted from 103.75 to 78.94 points in the second quarter (April) of 2001. This dramatic decrease is illustrated in Figure 1A. The fall has been maintained by the ominous economic conditions in the United States since the second half of 2000. For example, unit labour costs increased extensively in the last two quarters of 2000, the fastest increase since 1993. This relentless crippling of profit margins dampens the expectations of investors. Likewise, high energy costs have applied pressure to costs in 2000. Not only are investors dubious, consumers also are creating revenue problems as they are not buying new PC's. Although Microsoft is hit by falling sales, it still managed to make the top 25 in earnings in 2000.[5]

The NASDAQ index halved its value last year and the number of flotations have fallen Sharply.[6] From figure 3 it can be seen that the NASDAQ 100 index increased consistently from the second quarter in 1996 to the first quarter in 2000. However, the year 2000 was a bad year for the index. In the second quarter of 2000 the index fell from 3968.46 to 3444.64 points, coincidently at the same time as the Microsoft court case?[7]

Therefore, the openness of Microsoft to macroeconomic risk has shown that success is not entirely innate and that Microsoft as an entity is not wholly responsible in determining its success as a global competitor.

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[4] Pg 58, Business Week, 26th February 2001

[5] According to S&P Institutional Market Services in Business Week.

[6] Money Week, 2nd Feb 01. Does not apply specifically to NASDAQ 100 index.

[7] I can only speculate that causation exists, though the data does suggest the fall in Microsoft's share price caused this dramatic drop. The correlation coefficient of the NASDAQ regressed individually on the share price was $R^2 = 0.75798$, representative of the proportion of the variation in the dependent variable by variation in the independent variable

Bibliography

Business Week. (2001) *"Slower Growth without trauma."* February 2001.

Fortune Magazine. (2001) *"America's Most Admired Companies."* February 2001.

Gujarati, D.N. (1995) *Basic Econometrics.* London: McGraw-Hill.

Kennedy, Peter (1998) *A Guide to Econometrics.* Oxford: Blackwell

Money Week. (2001) *"What the Analysts are saying about stock markets world wide."* 2nd February 2001

Maddala, G.S. (1992) *Introduction to Econometrics.* New York: Prentice Hall Inc

The Economist (2001) *"Microsoft's cunning plan."* January 6th – 12th 2001.

Thomas, R.L. (1985) *Introductory Econometrics: Theory and Applications.* London: Longman Group.

Online References

Microsoft www.microsoft.com

Bureau of Labour Statistics www.bls.gov

New York Times www.nytimes.com

Credit Problems in Agricultural Sectors of CEECs

Rowena Dwyer – Senior Sophister

The lack of agricultural credit markets in the former communist countries of Europe poses a serious challenge to improving the quality of life of the rural poor in these countries. What should the governments there do? Rowena Dwyer examines the problems of land restitution and poorly defined property rights, and the possibilities of credit subsidies, loan guarantees and special institutions. Using the case of Poland, she rejects the latter proposal but sees a short-term role for subsidies and loan guarantees in improving these credit markets.

Introduction

> *'...in all countries, the incomplete process of defining land ownership rights and the lack of active land markets undoubtedly hampers agricultural development as farmers are thereby deprived of their best source of collateral for securing loans.'* (Buckwell, A., & S. Tangermann, 1997: 315)

Reform of the economies of Central and Eastern European countries, hereafter CEECs, over the past decade has led to the restructuring of both the agricultural and the banking sectors. The resultant fall in productivity in agriculture and the general disruption caused by reforms has led to it being viewed as a very high-risk area for investment. The fledgling banking institutions, with access to a very limited amount of funds are loath to direct any of these to a sector with so little prospect or return. Hence, the investment that is needed to enable the agricultural sector evolve into a competitive structure is not being provided. What factors have caused this virtual elimination of an agricultural credit market? Is it the actions of the banking institutions, or are they merely reacting to failures in other aspects of the transition economies? This essay posits that both explanations are true. It looks at three government policies used in developed economies to aid agricultural credit markets and questions whether any of these are suitable for the transition economies. Policy measures being used in Poland will be looked at, as with over 25% of the population involved in agriculture and facing EU accession, it is imperative that a successful formula be found to ensure future investment in their agricultural sector.

Credit markets operate under conditions of imperfect information. This is particularly true for the agricultural sector, as in agricultural production there is an inevitable time lag between the period of investment and costs and the time of harvest and revenues. The possibilities of failure are consequently higher – farmers can only base their supply on what was demanded in the previous time period. A

change in demand cannot be adjusted for by a similar, instantaneous, change in production. Two by-products of imperfect information are:

- Adverse selection: *'potential borrowers who are the most likely to produce an undesirable outcome (default on loans) are those who most actively seek loans and are therefore most likely to be selected,'*
- Moral hazard*: 'the lender is subject to the hazard that the borrower has an incentive to engage in activities that are undesirable from the lender's point of view'* (Swinnen, J., & H. Gow, 1997: 3)

Both of the above are prevalent in transition economies – but are they an inevitable fall-out from agricultural reforms or have they occurred due to government actions?

Restructuring of the banking-system

'...in a market economy, the main monetary policy instrument is the control of the total money supply, leaving the allocation of credit inside the economy largely to independent financial institutions, which base their lending policies on assessments of risk and financial returns. In centrally planned economies, the main monetary policy instrument was credit allocation.' (*ibid.*)

Credit was not allocated on a merit basis and was instrumental in propping up unsuccessful agricultural enterprises for an indefinite time period. Funding was often given with no interest attached, therefore there has been a problem in transition countries in accepting the 'costs' of borrowing – the payment of interest on credit. As stated earlier, credit has been limited for the newly independent banking institutions. For all the transition countries, rising inflation and the arrival of unemployment caused economic turbulence. However, in the CEECs, both have now largely been contained and the macroeconomic stabilisation necessary for growth is present. As the economies recover, it is instead the accumulation of bad debts from central planning and the lack of experience on the part of the banking institutions that are causing the most problems. How have the issues of land restitution and property rights, common to all the CEECs, been dealt with by the banking sector?

'Land during collectivisation could be changed quite dramatically in qualitative terms, but, as a defined physical location, it remained legally privately owned throughout the Communist regime in many CEECs' (Swinnen, J., Buckwell, A., & E. Mathijs, 1997: 351). As a result, the new governments of the CEECs had little choice but to restitute collective farm land to its original owners. It was

thought that this restitution to owners would result in the break-up of large farm structures. This would only result if there were a strong link between asset ownership and asset use. Tied to this, the benefits from leaving the collective farm system would have to outweigh the costs.

But what are the incentives for leaving a collective farm? Private farming is typified by one individual being able to perform a variety of tasks – including taking on the risks and responsibilities of one's own business. But with credit largely unavailable for small farmers, remaining under the mantle of collective farming is the more attractive option. Those who do leave the collective system are not investing. In Romania in 1996, only 4% of farmers had bought any type of equipment in the previous year, and 'in the few cases where loans were obtained, most loans were from family associations or formal associations, with very small incidence of borrowing from formal financial institutions, such as banks' (Sarris, A., Doucha, T., & E. Mathijs, 1999: 317).

How productive is the collective farming system? The accumulated debts run up by these during central planning were written off by the state, thus reducing incentives for better management. Unlike the industrial sectors, where outside owners provide access to capital, farms with a large share of outside owners are less efficient than those owned by insiders. Moral hazard is apparent in this situation with respect to the governance of the farm. If the owners are not in control of the running of the farm there is difficulty in linking effort to output. Consequently, farms are not as efficient as they could be. By not providing investment opportunities to private farmers, financial institutions can be held partly responsible for the continued existence of collective, and less efficient, farms. Their continued existence leads to adverse selection – the more inefficient the farm structure, the greater the likelihood of their requiring financial assistance.

Property rights

'Land restitution has not necessarily led to the full transfer of property rights to the new private owners' (Sarris, A., Doucha, T., & E. Mathijs, 1999: 308). Land restitution programmes generally have five steps (Swinnen, J., Buckwell, A., & E. Mathijs 1997: 342):

- Claims are submitted
- Ownership certificates are issued, indicating the rightful claim of the person or family to an asset
- The precise value of the asset is calculated and/or land parcels are redrawn

and the precise land parcel identified and registered
- Surveys are completed
- Land titles are issued.

Until all of these steps are carried out, land is not tradable. Because of this, land has generally been leased or rented in the CEECs, but for short periods only. Those renting the land have, therefore, very little incentive to invest in land improvement. This has led to lands being over-used, hence, productivity and land value have fallen. For those owning the land, this uncertainty has also led to a lack of investment, as 'legislation typically prevents the pledging of assets when they are under the process of privatisation and restitution' (Swinnen, J., & H. Gow, 1997: 7). Rural land is still not accepted as collateral. 'Land as security for long-term loans has been accepted only in Poland' (Trzeciak-Duval, A., 1999: 297). This occurs even in areas where property rights have been fully restored, as there is very little likelihood of banks being able to sell the property, if the borrower defaults. Farmers are required to provide more capital and pay higher interest rates for loans than borrowers in other industries. In this situation, it is the governments, rather than the banking institutions, who are hampering investments in agriculture, by not ensuring the legal establishment of property rights.

Government intervention in agricultural credit markets

How do governments intervene in the agricultural credit market? Does this investment help to improve the productivity of the sector, or merely finance inefficient practices? One of the most prominent institutions in the European Union is the Common Agricultural Policy. Its stated aims are of guaranteeing food security and quality for consumers at a reasonable price, whilst maintaining a proper standard of living for those working in agriculture. It has succeeded in creating an artificial system, whereby the prices received by producers are far removed from those they would receive on the world market. This artificial market has proven to be a financial burden for the EU and in recent years, reform of the CAP has been implemented, in order to reduce its crippling budget and to comply with WTO regulations.

In the CEECs, support for the agricultural sector was provided under central planning. Reform has led to farmers being exposed to world market prices, and subsequently, farm incomes fell dramatically. Government intervention in the agricultural credit market has increased in the last decade, and will be looked at under three headings – Credit subsidies, Government loan guarantees, and the

creation of Specialised Agricultural Credit institutions. The main advantages and disadvantages of the above are now outlined.

Credit subsidies

These involve "providing credit at 'preferential' interest rates to agricultural producers" (Swinnen, J., & H. Gow, 1997: 10). If land is accepted as collateral, then offering credit at reduced interest rates can help rejuvenate an agricultural sector 'crowded-out' by more attractive industries for investment. However, the subsidies have to be paid for by the government. Therefore, money is being channelled to a high-risk sector. If loans are defaulted on, then governments will have wasted funds that could have been more successfully employed elsewhere, perhaps for investment in public goods or infrastructure, which would indirectly have stimulated the agricultural sector.

As already mentioned, the use of rural land as collateral is still generally not accepted, therefore credit subsidies will have very little effect on the problem of farmers obtaining financing. For credit subsidies to be successful, they must only be for a limited time period – experience has shown in the EU that any form of subsidisation introduced into the CAP has subsequently been very difficult to dismantle. The governments of the CEECs cannot afford to provide unlimited support to the agricultural sector without running the risk of harming other sectors in their economies.

Government loan guarantees

The idea behind these is to make lending to farmers more attractive by the government agreeing to pay some percentage of the loan in the event of the borrower defaulting. The success of this scheme depends on the terms of the loan. If both the borrower and the bank involved are responsible for repaying as much as possible in the case of default, it will be in the bank's best interest to screen applicants and monitor repayments carefully. However, the danger can arise that by softening the bank's budget constraint, the guarantees will lead to an inefficient screening process. Also, moral hazard could arise. As the borrower believes that the government will automatically bail them out if they fail to repay the loan, their incentive to pay back the loan is thus diminished. For countries in transition, such a scheme may be unwise, with not only a fledgling banking institution, but also many

uncertainties surrounding government credibility.[1]

Specialised agricultural credit institutions

The creation of these should lead to a reduction in the asymmetry of information between borrower and lender. However, specialisation in the agricultural sector will lead to these financial institutions being open to greater risks and hence a higher chance of default. The lower success rate that these institutions have as compared with commercial banks will lead to the agricultural credit market being viewed in an unfavourable light. Credit will be available to farmers from these institutions alone – the credit market will become highly segregated. In the event of these institutions being disbanded on grounds of unprofitability, farmers will have no method of securing credit. Credit for the agricultural sector should be made available through the commercial banks. Segregation of the economies in the CEECs should be, if possible, avoided.

Poland

In Poland, credit subsidies were available before transition, through the co-operative state owned 'Bank for Food Economy' (BFE). After transition, farmers became high-risk investors and the collateral necessary for obtaining credit was so high that there was a decrease in the amount of preferential credit being requested. To address this problem, the government established, within the competence of the Minister for Agriculture and Rural Development, the 'Agency for Modernisation and Restructuring of Agriculture'[2] which 'operates its credit programmes through the commercial banking system, with the banks providing the system for the evaluation of suitable investment projects and the disbursement of the preferential credit at fixed interest rates' (Swinnen, J., & H. Gow, 1997: 19). The BFE is currently undergoing privatisation but still faces the problem of difficulties in loan recovery.

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[1] In Romania in 1996, a law was passed whereby defaulting borrowers are provided with unrestricted access to fresh loans (Swinnen, J., & H. Gow, 1997: 23).

[2] Agricultural Restructuring and Debt Rescheduling Fund was set up in 1992. Its activities were suspended in June 1993, due to irregularities in its administration (Swinnen, J, & H. Gow, 1997: 19).

With accession to the EU fast approaching, the Polish government has set out the following requirements for a coherent policy for rural development and agriculture (Polish Ministry of Agriculture and Food Economy, 1999: 61):

- 'the provision of sufficient national matching funding for the EU funds
- harmonisation of financial systems , in terms of subsidised credit, grants, guarantees and warranties
- arrangements for co-ordination between institutions responsible for programming, cofinancing and management.'

Ad-hoc measures will only lead to resource being wasted, therefore there will be strict monitoring of all programmes designed to financially aid agricultural and rural development, with progress reports being submitted to the statutory supervising bodes in an attempt to reduce the asymmetry of information existing in the agricultural credit market. 'In recognition of the importance of evaluation for effective management of public programmes, the Government of Poland intends to have the evaluation [of schemes] carried out in a more systematic manner so as to ensure that the limited aid resources are channelled into priority areas' (*ibid.*).

Conclusion

Government intervention is necessary in the agricultural credit markets of the CEECs. The new banking institutions, with access to a limited amount of funds will not, without some extra incentive, choose to lend money to a sector with such a high risk of defaulting. However, caution must be exercised as to the type and duration of aid that should be given by governments. Land restitution has not resulted in the emergence of private farms, and the remaining collective farms still exhibit a great degree of inefficiency. The uncertainty of property rights and the absence of a viable land market cause this slow emergence of a private farming sector. Therefore, governments can help the agricultural credit market, not just with financial aid, but also by firmly establishing the property rights of new owners.

Of the three policy choices discussed, the creation of specialised credit institutions is the least attractive option. Although they would result in a reduction of the asymmetry of information between borrower and lender – their likelihood of causing a complete segregation of the credit market, and of becoming a financial drain on the countries' economies is too great as to make their continuation/existence particularly viable.

Both credit subsides and loan guarantees are necessary to stimulate investment in the agricultural sector. However, it is necessary to set out a definite time limit to their operating and, again, to establish property rights and a land market. The Polish example outlines how important effective monitoring of all credit schemes is. If there is no improvement on the default level of agricultural loans and if the government is seen as still operating a soft-budget constraint – agricultural productivity will not have improved and there will be a further increase in the opportunity cost of providing credit for the agricultural market.

Bibliography

Buckwell, A. & Tangermann S., (1997) *"The CAP and Central and Eastern Europe"* in The Common Agricultural Policy, 2nd ed, Ritson, C., & Harvey D., CAB International, London.

Macours, K. & J. Swinnen, (1997) *Causes of output decline in economic transition: the case of Central and Eastern European agriculture.* Policy Research Group, Dept. of Agricultural Economics, Katholieke Universiteit Leuven. (Working paper no.11)

Ministry of Agriculture and Food economy (1999), *Coherent structural policy for rural areas and agricultural development.* Government of Poland.

Sarris, A., T. Doucha & E. Mathijs, (1999) *Agricultural restructuring in central and eastern Europe: implications for competitiveness and rural development.* European Review of Agricultural Economics.

Swinnen, J., A. Buckwell & E. Mathijs (ed.s) (1997) *Agricultural Privatisation, Land Reform and Farm Restructuring in Central and Eastern Europe.* Aldershott: Ashgate.

Swinnen, J. & H. Gow. (1997) "Agricultural credit problems and policies during the transition to a market economy in Central and Eastern Europe". Working paper No.6. Leuven: Katholieke Universiteit Leuven.

Trzeciak-Duval, A. (1999). *A decade of tranistion in central and eastern European agriculture.* European review of agricultural economics.

The Czech Employment Miracle: Reality, Myth or Luck?

Peter O'Brien – Senior Sophister

While the socialist state system guaranteed full employment, most countries experienced a rapid increase in unemployment in the first few years after transition, with the exception being the Czech Republic. Peter O'Brien looks at what the Czech Republic did right, seeing if it was merely a case of fortuitous initial endowments or other factors. He concludes that the effect of Active Labour Market Policies (ALMP's) was positive, although acknowledging that there exists a lack of evaluation of these policies.

Introduction

The Czech Republic (CR) appears to be the only country that has stemmed the flow into unemployment and has managed to keep the rate of unemployment at a relatively modest rate. Other CEE countries, including Slovakia (SK) have not been so fortunate and saw a sharp rise in unemployment in the first few years of transition. The CR and SK are a natural pair to compare as they had identical labour market institutions and regulations prior to the 'Velvet Divorce' of 1993. One of the main reasons attributed to the CR's low rate of unemployment has been its use of Active Labour Market Policies (ALMPs). In this paper, I aim to look at two interrelated areas. Firstly, a brief examination of the rationale behind using ALMPs in transition countries and secondly, the case of the CR and SK and the development of their employment policies following the 'Velvet Revolution' and an exploration of the extent to which ALMPs may have contributed to their different outcomes post-1993.

Why use Active Labour Market Policies?

1 The Uncertain Consensus

Active Labour Market Policies (ALMP's) have become increasingly popular among policy makers in the fight against unemployment. Sweden is the paradigmatic example of a western country with consistently low unemployment for a period of over thirty-five years and where ALMP's have been given much credit for their relative success. Many countries in the west had significant problems with high and persistent unemployment combined with generous welfare systems and draconian tax regimes, which led respectively to a high replacement ration on the one hand and the danger of a poverty (fiscal) trap on the other. An uncertain consensus has been emerging with regards to labour markets with some or all of the following at the top of the agenda:

- An attempt to 'activate' Labour Market interventions (See Box 2.1 for the main types of ALMP intervention). That is a move away from just providing benefits towards intervening with the person to help them find a suitable job or enter retraining.
- An attempt to reduce the impact of poverty traps by making benefit and tax regimes more work 'friendly'.

Box 2.1 - Main Types of Active Labour Market Policies

Calmfors (1994) characterised three main forms of ALMPs:

1. ***Job search assistance*** measures, which primarily involves the work of the Public Employment Services (PES). By providing information to the unemployed, PES may be able to reduce the duration of Unemployment spells and may improve the quality of job match in the economy. This is especially important in Transition countries where there is a high level of job creation and destruction.
2. ***Training Measures*** are usually intended to update an individual's human capital in line with the current skills requirements of the economy. They may also be used as a job 'test' to ascertain an individual's ability to work. This can be the case for those on the margins of the Labour Market.
3. ***Direct Job Creation*** can take two primary forms, namely public jobs or job subsidies to private employers. There may also be an element in some countries that supports entrepreneurs to set up businesses.

2. Active Labour Market Policies in Transition[1]

The restructuring of transition economies inevitably causes unemployment to set in as the process of restructuring gets underway. The emergence of Long Term Unemployment in many CEE countries is a cause for concern. Timely intervention in the form of a broad yet carefully selected portfolio of ALMP measures *may* reduce unemployment spells and the level of insider power.

Blanchard argues (1997: 88-94) that there was a two-sided effect on unemployment. On the one hand there was a distinct decrease in job creation, which led to a fall in the number of quits, while on the other hand there were fewer new jobs being produced, so the net result was a huge decrease in the number of new hirings. This led to what he characterised as a 'stagnant pool' in which the proportion of long-term unemployed gradually increased. It is essential, for reform to be supported, that this does not lead to a growing population of disaffected people who could call for reforms to be reversed or slowed down.

Köning and Walsh (1999) have highlighted micro level sectoral differences and point to the relative success of *de novo* firms in comparison to traditional State-owned enterprises, especially in relation to job creation. The encouragement of an entrepreneurial spirit through the education and training systems and some targeted finance may help some start up companies and foster an entrepreneurial climate, this is especially important as banks are usually restricted (in terms of lending) in the earlier stages of transition.

In transition economies there may not exist the informational infrastructure to alert job seekers of available vacancies or training opportunities. It is therefore essential that there exists an effective Public Employment Service, which can provide timely and case-sensitive information. This is not to say that there are no risks attached to the use of ALMPs. Without going into detail[2],it is suffice to say that ALMPs as with any other policy are prone to abuse, misuse, poor targeting, inefficiency etc. The main types of negative effects are:

1. **Dead-weight Loss:** The jobs may have been created without subsidy.

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[1] There exists a substantial literature on the rationale behind using ALMPs in Transition economies (See for example Burda & Lubyova, 1996). I aim here only to briefly introduce some of the potential motivations for 'activating' labour market interventions. See also Appendix 1 for the main characteristics of ALMPs.

[2] See Fay (1996) for a comprehensive exploration of the potential negatives of ALMPs. & Appendix 1.)

2. **Substitution:** The subsidised worker may just be replacing an unsubsidised worker.
3. **Displacement:** Subsidised firms may have an advantage over non-subsidised firms.

Let us now turn to our two case countries and look initially at their labour history since 1991.

The Development of ALMPs in the Czech Republic and Slovakia

Czechoslovakia, The Early Years[3]: In 1989, after the Velvet Revolution, Czechoslovakia set out on an ambitious programme of privatisation and market liberalisation and reform. In terms of Labour Markets, what they had inherited was a system where everyone worked as a form of social obligation and there was a job for everyone. In an environment of centralised targets and soft budget constraints large companies could afford to hoard staff. As a result there was a lot of underemployment in the economy. The closure of inefficient firms led unemployment being seen for the first time in 1990 with rates of 0.7% and 1.5% in the CR and SK respectively, however, the most marked change may be seen in the second year, when there was a rise to 4.13% in the CR and a very large 11.8% in SK. This regional disparity did not go unnoticed and may have been one of the key factors leading up to the Velvet Divorce in 1993.

There was a lot of work to be done before this happened and we will examine briefly some of the key changes in the period 1989 - 1992 with regards to ALMPs. By 6th June 1991, unemployment was a distinct reality in Czechoslovakia and the government introduced ALMP legislation based on the Swedish model. A Federal Ministry for Labour,[4] with two republican offices, was established and charged with the implementation of a series of Active Labour Market Policies. Their core aims can be summarised as follows:

- To provide information, advice and assistance in finding employment
- To create jobs through subsidies to employment generating enterprises

There were four specific programmes involved in the ALMP package:[5]

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[3] For a full discussion, see Ham *et al* (1995) or Burda & Lubyova (1995). For a brief overview of the Law on Employment, see Appendix 2

[4] Abolished in 1993

[5] Ham *et al* (1995) also report that District Labour Offices give subsidies to firms that

1) **Socially Purposeful Jobs (SPJs):** These cover two types of subsidies. The first is to help unemployed set up new companies and the other subsidises positions in existing enterprises.
2) **Publicly Useful Jobs (PUJs):** Primarily, but not exclusively, intended to be provided by Local Authorities, these jobs are intended to test a candidate's work readiness and keep those on the margin attached to the Labour Force. There may be an inherent problem/stigma attached to these positions as they tend to be offered only to those with the least chance of getting a job. Employers know this and this may act against those participants, especially in an employer's labour market.
3) **Job Subsidies for new Graduates:** Also known as YSL (Youth and School-leaver jobs), these jobs are essentially the same as SPJs except that they target younger people.
4) **(Re-)Training for the unemployed:** Primarily intended to equip or update individuals with skills relevant to the modern economy. Training is actually a legal entitlement for the unemployed[6].

Up until 1992, there was a strict federal division of the amount allocated to ALMPs. So, even tough SK had far higher unemployment (11.8%) in 1991 then the CR (4.1%), there was more spent in the CR on ALMPs in that year. This was changed in 1992 in favour of SK[7]. One final issue to mention is that of inflows and outflows into unemployment. While inflow rates in the CR and SK were low in 1990 and 1996 by OECD levels (Martin, 1998), the interesting feature has to be the outflow rates achieved in the CR (Boeri, 1994), with rates on average three times higher than the other CEE countries. Let us now look at the two countries separately and analyse the empirical investigations into the effects of ALMPs in the two countries.

After the Velvet Divorce, Disparate Results - the Impact of ALMPs

introduce technological change that reduce worker hours. This reduces any lay-offs that may have resulted.

[6] However, only 5.5% of all unemployed people in the CR in 1992 availed of training (Ham *et al*, 1995: p.137)

[7] 1992 saw an increase in ALMP expenditure in both Republics, the amount in the CR more than doubled, whereas the amount in SK rose more than seven-fold. Although even this reallocation could not stop the calls for independence that were reaching a peak in 1991-2 and led to the Velvet Divorce of 1993.

As we can see from Table 3.2.1, spending on active and passive employment measures in 1993 was not that extraordinary by OECD standards, although spending per person unemployed in the CR was in line with the upper levels and spending in SK was more similar to the other CEE countries. We now turn our attention to some of the literature that investigated ALMPs in the CR and SK and look at how much ALMPs mattered.

2.1 The Czech Republic: The CR managed to keep unemployment at 2-4% right up until the middle of 1997. One of the key reasons for this was the CR's exceptionally high outflow rate from unemployment. This is often attributed to the role of ALMPs and we will examine some of the empirical evidence later on. Most authors agree that ALMPs only represent one of many factors in the success of the CR and point clearly to a variety of initial conditions and endowments as the main factor, however ALMPs are something over which governments have relative control, hence the justification for focussing on ALMPs. Looking at the data for 1991-93, it is clear that the CR had a very different distribution of ALMP expenditure with a larger focus on self-employment (SE) and YSL (see Table 3.1.2). The emphasis on entrepreneurial factors is important, as it is the new companies that seem to have the largest job creation.

One of the key features according to Ham *et al* (1998: 1120) is the ability of the CR to absorb low-skilled unemployed into employment at a rate similar to skilled unemployed. In other CEE countries, this group of people have been far more likely to become unemployed and stay unemployed for longer. It may be that the CR had a more favourable endowment of a better skilled labour force. Janacek (1995: 67) attributes the success of ALMPs on their ability to update or reequip people with the skills necessary for the market economy. This resonates with the shift in employment evident in both republics, where we see a large rise in the numbers employed in the service sector.

The unemployed in the CR were far more likely to get a job than their counterparts in SK. In 1993, 16.5% of the registered unemployed signed off to take up work in the CR, while the corresponding figure for SK was 4.7%. A number of authors point to staffing levels at the national PES as a potential justification for these discrepancies. Data from the OECD suggest that those countries with higher unemployment also have the lowest PES staff to unemployed ratio although causality may be the other way around (Burda and Lubyova, 1995: 192). There is an emerging consensus in the literature that PES services are the least expensive and

most effective labour market intervention. Direct contact with the unemployed can have a 'prodding' effect, especially for the long term unemployed.

Boeri *et al*, (1998: 83) report a statistically significant association of PES staff on outflows from unemployment in a cross-section of Czech Labour Market offices. They found that a 1% increase in counselling staff is associated with 0.2% more outflows of unemployed into regular employment. There may be a case therefore for a proportionate rise in the number of counselling staff for a rise in the number of unemployed. Burda and Lubyova (1995: 198) looked at the sharp decrease in ALMP expenditure in the two republics in 1993 and found that half of the subsequent increase in unemployment could be accounted for by the decrease in ALMP expenditure.

2.2 Slovakia: Independence led to a sharp decrease in ALMP expenditure in Slovakia (see Table 3.1.2). The duration of unemployment is up to four times higher in Slovakia than it is in the Czech Republic and with the number of unemployed per vacancy reaching a high of 89.65 in 1999. Although the figure is estimated to have fallen in 2000 and again in early 2001, these figures still pose an enormous challenge for the authorities.

Substantial reforms were made in 1997, with increased targeting of expenditure on ALMPs. A study by Lubyova and Van Ours (1999), reported by the IMF (2000) found empirical evidence for a positive effect on specific Labour Market Policies notably retraining and PUJs. They found a negative effect for SPJs. In general, the IMF argue (2000: 42) that ALMPs tend to be more effective when they are addressed at increasing the capacity of specific group of workers. This is especially damning if you take into account that SPJs have traditionally been by far the largest component of ALMP expenditure in SK. That being said, with the nominal amount of expenditure such a small amount in 2000, it may be not as important a finding now as in 1996 (reforms were made in 1997).

Since independence, Slovakia has decreased the proportion of Labour Market Policies that are active. ALMPs in Slovakia rely on funding from a contributory employment fund, from which both Passive and Active Labour Market Policies are financed. This obviously has serious implications in a climate of increasing unemployment. The evidence reported above with regard to PES staff applies also to SK.

Conclusions

In line with the general conclusions for OECD countries, it is reasonable to suspect that ALMPs can have a positive effect on reducing unemployment and up-skilling an economy and indeed the evidence points to a small positive effect of ALMPs on unemployment. PES administration, job counselling and some PUJ schemes were shown to be successful. Boeri (1998: 84) and others have criticised the lack of evaluation that exists on active labour market programmes. I would agree with him when he argues that certain programmes can be wasteful and would argue that programmes need to well *targeted* and efficiently managed. This has been one criticism of the Slovak system that it has an inefficient administration, but with spending in 1999 so low, I am not sure that this is a key issue (Hiadlovská, 1998: 262). There would appear to be a great need for a new way of funding ALMPs in SK and for an acknowledgement of the potential benefits of ALMPs.

In transition countries, it may be the case that there is a theoretical justification for an emphasis to be given to retraining or entrepreneurial programmes[8] and there may also be a case for some government subsidy as a short-term measure to alleviate unacceptably high levels of unemployment as firms restructure. Finally, there is a need to conceive of transition labour markets outside of the traditional western paradigm and while there is a role for ALMPs in transition, we need to establish what works and why, before we can come up with a framework that is truly relevant to transition economies.

Bibliography

Adnett, N. (1996) *European Labour Markets.* London: Longman.

Blanchard, O. (1997) *The Economics of Post-Communist Transition.* Oxford: OUP.

Boeri *et al.* (1998) *Mediating the Transition: Labour Markets in Central and Eastern Europe.* London: CEPR

Burda, M. & M. Lubyova (1995) "The Impact of Active Labour Market Policies: A Closer Look at the Czech and Slovak Republics." In D. Newbery (ed.) *Tax and Benefit Reform in Central and Eastern Europe.* London: CEPR.

[8] There appears to be no evaluations done on these programmes to date.

Calmfors, L. "Active Labour Market Policy and Unemployment - A Framework for the Analysis of Crucial Design Features." *OECD Economic Studies.* 22 (Spring 1994): 7-47.

Fay, R.G. (1996) "Enhancing the Effectiveness of active Labour Market Policies: Evidence from Programme Evaluations in OECD Countries." *OECD Labour Market and Social Policy Occasional Papers.* No. 18. Paris: OECD.

Ham *et al* (1995) "Czech Republic and Slovakia." *Unemployment, restructuring, and the labour market in Eastern Europe and Russia.* Ed. S. Commander. Washington: World Bank

Ham, J., J. Svejnar & K. Terrell. "Unemployment and the Social Safety Net During Transitions to a Market Economy: Evidence from the Czech and Slovak Republics." *American Economic Review.* 88. 5 (1998).

Hiadlovska, M. (1998) "Regional Labour Market Institutions in Slovakia." *Institutions and regional labour markets in Europe.* Ed. L. Laan & S. Ruesga. Aldershot: Ashgate.

IMF (2000) *Transition Economies: An IMF Perspective on Progress and Prospects.* Washington: IMF.

Janacek, Kamil (1995) "Unemployment and the Labour Market in Former Czechoslovakia and the Czech republic." In M. Jackson *et al* (eds.) *Unemployment and Evolving Labour Markets in Central and Eastern Europe.* Aldershot: Avery.

Koltoy, Jenö (1995) "Unemployment and Employment Policy in Central and Eastern Europe." In M. Jackson *et al* (eds.) *Unemployment and Evolving Labour Markets in Central and Eastern Europe.* Aldershot: Avery.

Könings, J. & P.P. Walsh (1999) "Disorganisation in the Transition Process: Firm Level Evidence from Ukraine." *Economics of Transition.* 7.1: 29-46.

Martin, J.P. (1998) "What Works Among Active Labour Market Policies: Evidence from OECD Countries Experiences." *OECD Labour Market and Social Policy Occasional Papers.*No. 35. Paris: OECD.

Appendix

Table 3.1.1 Key Figures for 1990 - 2001[1]

The Czech Republic

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP (% Change)	-1.2	-11.5	-3.3	0.1	2.2	5.9	4.8	-1	-2.2	-0.2		
Unemployment (%)	0.73[2]	4.13[2]	2.57[2]	3.52[2]	3.19[2]	2.93[2]	3.52[2]	5.23[2]	7.48[2]	9.37[2]	8.66[3]	8.56[4]
Inflation (%)	9.7	56.6	11.1	20.8	10	9.1	8.8	8.5	10.7	2.1	3.9	4.0[5]

Slovakia

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP (% Change)	2.5	-14.6	-6.5	-3.7	4.9	6.7	6.2	6.2	4.4	1.9	2.1	
Unemployment (%)	1.5	11.8	10.3	13.7[6]	14.1[6]	12.4[6]	10.9[6]	11.8[6]	12.5[6]	17.1[6]		
Inflation (%)	10.4	60.6[6]	10.2[6]	23.0[6]	13.7[6]	10.0[6]	5.8[6]	6.1[6]	6.7[6]	10.6		

1. All figures derived from <http://www.bcemag.com>, unless otherwise stated
2. **Source:** Czech Statistical Yearbook 2000: <http://www.czso.cz/eng/figures/1/10/2000/data/excel/10/1010.xls>
3. **Source:** Labour Force Survey June 2000: <http://www.czso.cz/eng/figures/1/15/mmf2000/chap5.htm>
4. Seasonally Adjusted LFS for end January 2001: <http://www.czso.cz/eng/topical/bsi/avyb0215.htm>
5. Jan 2001 - Czech Statistics agency website: <http://www.czso.cz/eng/topical/inflat/inflation.htm>
6. **Source:** Slovak Republic: Selected Issues and Statistical Appendix Series: Staff Country Report No. 00/115: http://www.imf.org/external/pubs/ft/scr/2000/cr00115.pdf

Table 3.1.2 Budget allocation Within Active Employment Programmes, 1991-3 (in thousands of crowns)								
	Czech Republic							
	Total	SPJ	SE	PUJ	RET	Y&SL	Hours	Other
1991								
Cost	772,995	330,363	166,783	78,390	39,980	47,735	78,788	29,956
Distribution (%)	100	42.7	21.6	10.1	5.2	6.2	10.3	3.9
1992								
Cost	1,718,096	736,596	232,024	223,027	94,023	325,528	36,400	70,500
Distribution (%)	100	42.9	13.5	13	5.5	18.9	2.1	4.1
1993								
Cost	749,409	170,567	159,605	159,605	73,359	245,190	4,368	49,022
Distribution (%)	100	22.8	6.3	21.3	9.8	32.7	0.6	6.5
	Slovakia							
1991								
Cost	515,259	352,375	d	108,210	54,675	-	-	-
Distribution (%)	100	68.4	d	21	10.6	-	-	-
1992								
Cost	3,812,793	2,857,235	14,307	402,903	292,051	97,767	122,778	25,752
Distribution (%)	100	74.9	0.4	10.6	7.7	2.6	3.2	0.7
1993								
Cost	1,107,216	748,047	2,445	163,932	118,280	54,232	8,029	12,250
Distribution (%)	100	67.6	0.2	14.8	10.7	0.7	0.7	1.1

Source: Ham *et al* (1995)

Table 3.2.1 Active and Passive Labour Market Expenditure in Selected Countries

Country	Active Measures			Passive Measures		
	Total Active Spending (% of GDP)	Total Inflows into Programmes (% of Labour Force)	ALMP expd. Per %point L.F. inflow (% of GDP)	Total Passive Spending (%of GDP)	UE rate, % (LFS)	GDP cost per %point unemployment
Bulgaria (1993)	0.09	0.6	0.15	0.67	21.4	0.03
Czech Republic (1993)	**0.2**	**0.8**	**0.25**	**0.16**	**3.8**	**0.04**
Hungary (1993)	0.67	3.4	0.12	2.27	12	0.19
Poland (1993)	0.36	5.7	0.06	1.82	13.1	0.14
Slovakia (1993)	**0.44**	**4**	**0.11**	**0.77**	**12.7**	**0.06**
Slovenia (1995)	0.68	11	0.06	0.75	7.4	0.1
Sweden (1993-4)	*2.98*	*15.2*	*0.2*	*2.77*	*9.7*	*0.07*
Spain (1994)	0.6	2.2	0.27	3.26	23.8	0.14
UK (1993-4)	0.57	2.4	0.24	1.6	10	0.16

Source: Boeri et al (1998: 80, table 4.4) and OECD (1996a) Employment Outlook

Table 3.2.1 Labour Market Data for the Czech Republic

	Total No. of Vacancies ('000s)[1]	*Total No. of Unemployed ('000s)*[1]	*No. of vacancies per Unemployed*[2]	*No. of Unemployed Per Vacancy*[2]	*Inflow rate*[3]	*Outflow Rate*[3]
1990	57.6	39.4	1.46	0.68	-	-
1991	48.4	221.7	0.22	4.58	0.9	17.1
1992	79.4	134.8	0.59	1.70	0.9	26.6
1993	53.9	185.2	0.29	3.43	0.7	22
1994	76.6	166.5	0.46	2.17	0.6	21.3
1995	88.0	153.0	0.58	1.74	0.6	21.3
1996	84.0	186.3	0.45	2.22	0.6	19.3
1997	62.3	268.9	0.23	4.32	-	-
1998	37.6	386.9	0.10	10.28	-	-
1999	35.1	487.6	0.07	13.89	-	-

[1]**Source:** 19/02/01 Czech Statistical Yearbook 2000

[2] Author's Calculations

[3]**Source:** Ham et al (1998)

Labour Market Data for the Czech Republic

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[1]**Source:** 19/02/01 Czech Statistical Yearbook 2000

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EU Membership and its Impact on Ireland

Stephen Butterly- Junior Sophister

In the days of The Celtic Tiger cliché, there are many who see little benefit in their lives and others who would not credit the EU for our impressive decade. Stephen Butterly rebuts those viewpoints. He highlights the direct and indirect import of structural funding and CAP. Of great importance also is the Single European Market and foreign investment. Nonetheless, with the changing position of Ireland in Europe, he concludes that we might not always be as enthusiastic about the EU.

Introduction

It seems that the myth is true. I have long heard that the Irish are their own worst critics, and I now believe this to be so. The prompt that has led me to this conclusion are the almost daily complaints I hear from many quarters regarding the 'so-called' Celtic Tiger. Some people bemoan the unfortunate phraseology attached to Ireland's recent economic growth, whereas others question its very existence. For a nation so economically crippled merely a few years ago, such complaints are the antithesis of the celebratory mood one would expect to prevail.

Whilst accepting that the fruits of our startling economic progress during the 1990s have been less than equally distributed, one cannot deny the success in aggregate terms. As such, throughout the course of this essay, I intend to show the reader just how significant a factor I believe our membership of the EU to have been in contributing to Ireland's startling economic performance of the 1990s. To begin with, however, I would like to introduce some statistics to showcase this growth, followed by a brief commentary on some of the domestic factors supporting such growth, before the essay switches focus to matters beyond the borders of this small island.

Statistical Analysis - Growth in the 90's

Below is a brief summary of the data necessary to highlight Ireland's phenomenal recent growth:

TABLE 1. NATIONAL FINANCES; Values in IR£ @1999 Prices

	1994	1995	1996	1997	1998	1999	2000[e]
GDP Value	46,503m	52,579m	57,944m	66,992m	76,923m	87,677m	103,170 m
GNP Value	41,785m	46,631m	51,408m	58,952m	67,541m	75,001m	87,390m
GDP per capita	12,968	14,601	15,980	18,298	20,762	23,411	-
GNP per Capita	11,652	12,949	14,178	16,103	18,230	20,026	-

Source: Central Statistics Office Archives; www.cso.ie

Table 2: LABOUR STATISTICS (1996 - 2000); Values in '000s

Indicator	1996	1997	1998	1999	2000
Total Labour Force	1508	1539	1621.1	1688.1	1815.6
Total in Employment	1329	1380	1494.5	1591.1	1737.9
Total Unemployed	179	159	126.6	96.9	77.7
Unemployment Average	11.5%	9.8%	7.4%	5.5%	4.1%

Source: Central Statistics Office Archives; www.cso.ie

Startling as the growth rates may be, for many commentators the true value of the Celtic Tiger is expressed in the impact on employment - Ireland has finally managed to purge itself of the curse of 'jobless growth'.

Factors Contributing to Growth:

One cannot isolate any one factor as being the primary cause of our economic miracle. Each one is vital, but not sufficient, in isolation and as such I must emphasise the importance of their interrelation. The following list is brief, but I believe it to be sufficient in reminding the reader at all times to remain aware of factors other than those emanating from Brussels when examining the topic at hand.

- Commitment to fiscal rectitude by the Irish Government.

- Large supply of young and educated workers.
- Corporate tax concessions and grant aid designed to attract FDI.
- Government/Trade Union/Employer agreements (Social Partnership).
- Emergence of knowledge-based industries, thereby negating many of the transport costs imposed on peripheral regions by traditional resource-based industries.
- Generally low and stable interest/inflation rates - conducive to investment.

EU Contribution to Economic Growth

Although 1973 marked the beginning of Ireland's European odyssey, many years of integrative stagnation followed, with factors outside of European control, such as the oil crises of the 1970s, distracting attention away from the European integration programme towards matters of more immediate economic concern. It was not until the Single European Act of 1986, which committed the member states to the notion of creating a market without internal frontiers, and also to the concept of reducing regional disparity, that the drive towards unity was inspired with a new impetus. As a small open economy on the fringes of Europe, such commitments would prove ideal for Ireland.

The single market commitment awakened fears that the underdeveloped economies of Ireland, Greece, Portugal and Spain would not be able to compete with the core countries in the new market structure. Regional aid was thus proposed to allow these countries to develop their competitive abilities and to compensate for any potential losses (Matthews, 1994). However, far from suffering in the new trade scenario, Ireland benefited greatly, and thus one must view our somewhat disproportionate receipt of EU funding as extremely fortunate. In stating this, however, it is not my attention to belittle the impact of the funding, as shall shortly become apparent. I now propose to analyse the EU impact under three headings:

(i) Structural Funding & CAP
(ii) Single Market opportunities
(iii) Foreign Direct Investment

Structural Funding & CAP:

Opinions vary widely as to whether or not Structural Funding (SF), in its various guises, had any real impact on the Irish economy during the nineties, and indeed studies on the *direct impacts* seem to be consistent in proclaiming SF to have contributed a very low amount to economic growth. Examples of such studies show

the Delors I package of 1988-1993 as contributing a mere 2.7% to GNP by the year 2000 (O'Donnell, 2000) whilst the ESRI predict the combined effects of Delors I&II as contributing only 2% to long run growth (Honohan, 1997).

However, I feel that to quantify only the direct impacts is to miss the point and purpose of the funding, for when viewed as the *catalysts* they were designed to be, it is clear that the transfers have been of great importance. To begin, some details regarding the nature of Structural Funding.

- The Irish Community Support Framework (CSF), a joint enterprise between the EU Commission, the Irish Government and National bodies, is financed by four EU transfer funds - the ERDF[1] (45%), the ESF[2] (35%), the EAGGF[3](19%) and the FIFG[4] (1%)

- In conjunction with the European Cohesion Fund, EU transfers have been substantial; between '89 and '93 (Delors I), transfers of 4.2bn ecu co-financed CSF of 9.2bn ecu, whilst between '94 and '99 (Delors II), transfers of 8.5bn Euros co-financed CSF of 10.6bn Euros. (www.csfinfo.com)

1. Factors Contributing to the success of Structural Funding:

To begin with, I would like to mention three factors which I believe ensured the success of SF. Firstly, the transfers began at a time when the Fianna Fail Government, supported by the Fine Gael opposition under Alan Dukes, was implementing a new and extremely rigid fiscal policy. Thus, they were able to take control of Exchequer finances and simultaneously pursue and complete much needed development programmes. As Honohan states "Without the support of the structural funds, congestion in the public infrastructure and constraints in 3rd level education would have delayed recovery for years" (Honohan, 1997). Secondly, there was logic in the manner in which the funds were only applied to problems they felt they could solve, such as strengthening infrastructure, as opposed to addressing

[1] ERDF = European Regional Development Fund

[2] ESF = European Social Fund

[3] EAGGF = European Agriculture and Guarantee Fund

[4] FIFG = Financial Instrument for Fisheries Guidance

'thankless' areas e.g. inefficient, sheltered private industries (Honohan, 1997). Thirdly, by embracing the concept of subsidiarity and implementing the Delors I&II packages in conjunction with National Development Plans, it ensured the SFs reached the appropriate destination in their pursuit of *measured goals.*

2. Positive Outcomes of Structural Funding:

Economic commentators believe the long run effects of SF in introducing new frameworks and methods for managing development plans far outweigh the short run economic gains (Central Bank Bulletin, 2000). Indeed, it is in the somewhat 'unquantifiable' long run in which the greatest gains lie. Short run demand side gains continue to provide a boost to our economy, for example a building industry operating at full capacity to provide infrastructural development, but the long run result of SF has been manifested in Ireland's ever increasing supply side ability, which Frank Barry believes to be central to our recent, and future, economic progress (1999).

SF has helped Ireland to embrace the opportunities that industrial changes have brought. Through the implementation of programmes to tackle Human Resource, Marketing and R&D deficiencies, our economy has become adept at providing for new technical and knowledge based industries. The immediate effect is a boost to productivity and employment, but one must also consider the spillover effects in terms of our industrial education. Through "learning by doing", Irish workers can now use technical employment, much of which is in multinational firms, to incubate their knowledge which is eminently transferable to personal enterprise (O'Donnell, 2000).

The Common Agricultural Policy is an area of economic policy which can also readily be classified under social and political policy, and it is this overtly 'human' element of it that renders cold economic analysis difficult for policy makers to subscribe to. Arising from a period of time where the food crises of World War II were still prominent in the memories of Europeans, CAP set about achieving laudable aims, such as ensuring the availability of food supplies and guaranteeing a fair standard of living for the agricultural community. The original intention was to devote approximately 66% of CAP resources to the price and markets guarantee policies, with the remaining 33% being targeted at socio-structural and rural development policies. However, history has shown this ratio to have been closer to 95% in reality.

Traditionally, a large proportion of the Irish labour force has been involved in agriculture, and as such, a large proportion have benefited from the CAP in various ways. In absolute terms, the transfer from CAP have been enormous - in the mid 1990s annual transfers were in the region of £1.5bn, with transfers in 1997 estimated at approximately 4% of GNP (Matthews, 2000). However, it is at this point where one must differentiate between the receipt of large transfers from CAP and the contribution to economic growth. Ireland has benefited in terms of guaranteed prices and markets, rural redevelopment and a small multiplier effect in terms of food processing, but if one focuses solely on the question posed in this essay, the inevitable answer is that CAP has had a negligible impact on growth in the 1990s. O'Donnell supports such a view in stating that EU transfers would have had a far greater economic impact if targeted solely at productive sectors rather than supporting the inefficiencies so evident in the agricultural sector (O' Donnell, 2000). As Matthews states, the operating costs of CAP in terms of administration, storage of over-production and general 'leakages' are so high that the costs of the CAP now outweigh the benefits to the agricultural community. Further to this, the burden on the Irish taxpayer in supporting CAP has recently been described as equivalent to a 20% VAT on food (Matthews, 2000).

The EU has been fully aware of these problems for some time, and efforts at reform, such as those instigated by McSharry in the early 1990s, are set to continue. For Ireland, as EU funding is set to decrease rapidly in the coming years, one could not expect CAP funding to be redirected to more 'productive' sectors of the economy, even though such an approach may seem logical. Matthews argues that a more open agricultural system, with market price support replaced solely by direct income support, would result in the restructuring of capital and labour in rural areas towards progressive, buoyancy industries that would further fuel Ireland's economic progress (Matthews, 2000). Convincing agricultural communities of the benefits of such an approach, however, would be a momentous task, and as mentioned earlier the prevailing socio-political agenda may be too entrenched to expect any great change.

The Single European Market

A detailed analysis of the mechanics and aims of the Single Market Programme is beyond the scope of this essay, but suffice to say that the central tenets involved the creation of a trading bloc or an area 'without internal frontiers', to quote a much used phrase. Following from this was the even deeper commitment encapsulated in the Maastricht Treaty of a Europe striving for economic and

monetary union. I intend to show that the Single Market ideal, far from marginalising our economy as feared by many at inception (Matthews, 1994), has afforded Ireland the perfect vehicle for economic growth, and I shall address this issue under three broad headings.

Enhanced Trading Opportunities:

For a small, open economy such as ours the opportunity to engage in boundary free trade with a market of over 300million consumers was certainly one to be embraced, as it would allow ambitious enterprises to break free of the limited demand levels of this small island. Sweeney remarks that the Single Market participants represented, for Ireland, a wealthy group of potential clients who demanded the high value goods we were becoming increasingly adept at providing (Sweeney, 1998). The export figures below certainly support such an hypothesis.

Table 3: Trade Statistics: Values in IR£m

Year	Imports	Exports	Balance
1991	12,851	15,019	2,168
1993	14,885	19,830	4,945
1995	20,619	27,825	7,206
1997	25,882	35,336	9,454
1999	34,412	52,227	17,814

Source: Central Statistics Office Archives; www.cso.ie

An issue often addressed in tandem with this is the opportunity presented to Ireland to move away from its traditional trading reliance on the U.K. As one of the lower-growth economies of the EU, it was the UK's geographical location and traditional linkages with Ireland, rather than its overtly profitable business opportunities, that had fostered this trade dependence. The Single Market Programme can thus be said to have laid the foundations for Ireland's economic autonomy, with the Maastricht Treaty representing the solidification of the aspirational leap away from the U.K. towards new and more fruitful opportunities. As is evident from Table 4, trade with the U.K. remains very significant, but the impact of EU trade on our trade balance is a telling statistic.

Table 4: Principal Trading Partners - 1999; Values in IR£m

Country	Imports	Exports	Trade Balance
United Kingdom	11,310	11,378	+68
Other EU Countries	7,570	22,392	+14,821
USA	5,729	8,096	+2,340
Rest of World	9,803	10,388	+585

Source: Central Statistics Office Archives; www.cso.ie

A powerful trading bloc also instantly lent Ireland a fuller degree of weight on world trading markets. Enhanced by the EU's open trade policy, Ireland enjoyed unprecedented levels of extra-EU trade during the 1990s. For example, statistics generated by the Irish Business Bureau indicate a 37% rise in exports to and a 26% rise in imports from extra-EU countries in 1997 (www.ibb.be). One should also contemplate the future trading benefits of EU membership that should occur upon accession of the Central and East European Countries.

Market Deregulation

Inherent in the concept of a Single Market is the process of deregulation, where international barriers are broken and national market protection is shattered. During the 1990s, for the first time in its history Ireland found itself in the position of being able to adjust to and benefit from such deregulation. The immediate effect of such competition became apparent through increased levels of productivity and efficiency, a prime example being the lowering of utility costs for domestic and, increasingly importantly, for multinational enterprises. Service sectors, such as air transport and telecommunications, are now operating with a new found level of competitive ability in this era of increased foreign competition.

An area worthy of particular mention for Ireland is that of financial market deregulation. A strikingly apparent boost to the Irish economy of the 1990s was the resulting development of the IFSC. Despite employing a relatively small number of people, the IFSC rejuvenated what was previously a stagnant sector of our economy. Profit levels are quite extraordinary from this new financial oasis, resulting in significant tax contributions to an already bulging exchequer surplus. A less

obvious, but nonetheless significant, impact of fluid capital flows throughout the EU, can be seen in the balance it brings to an economy such as Ireland's, where consumer spending patterns can be harmonised across times of growth and recession, as capital moves to fill voids and relieve potentially ruinous surpluses (O'Donnell, 2000).

Economic & Monetary Union:

The impetus behind the drive to EMU lay in the widely held belief that, in the long-run, a single market can not survive without the existence of a common currency and a unified approach to economic management. The Maastricht Treaty encapsulated the framework through which EMU would be achieved, and it was relatively easy for the authorities to gain support for the programme by citing expected gains in areas such as price transparency, decreased administration costs and enhanced trading abilities on world markets.

Currently, the Euro currency is experiencing a somewhat turbulent infancy, and many of the expected benefits have yet to come to fruition. As such I will instead focus briefly on the impact EMU has had on Irish fiscal rectitude.

The Maastricht Treaty laid down the criteria to be met in order to qualify for accession to the EMU programme. Briefly, these were:

- Inflation rates no more than 1.5% higher than the average of the three best performing countries
- Annual Public Sector Borrowing Requirement of less than 3% of GDP
- Reduction of National Debt to 60% of GDP
- Restrictions on currency devaluations
- Long term interest rates within 2% of the average of the three best performing countries

Although somewhat arbitrary in nature, the true value of the targets lay in a *common approach.* Debate continues in Ireland as to whether or not these criteria influenced our fiscal behaviour. The statistics show that we made great efforts towards meeting these criteria, but many believe that the drive behind such action came from within the country, as alluded to earlier in the section on Structural Funding, and would have been achieved without EU influence (Foundation for Fiscal Studies, 1995). Others believe the 'preparation for and transition to EMU provided the sheet anchor of the new macroeconomic approach' (NESC, 1997; 69).

My belief is that the true answer lies in a compromise approach, where domestic realisation of our fiscal problems became *focused* by the Maastricht criteria. By committing ourselves to a programme where we had no alternative, immediate fiscal discipline was imposed which continues to serve Ireland well in providing a stable base on which the economy can prosper, with generally low and predictable inflation rates circulating confidence throughout the economy and the reduction in national debt liberating Government finances to focus on more productive matters.

Foreign Direct Investment:

Multinational activity in Ireland is considerable, and has been one of the defining features of our economic landscape in recent times. Indeed, a comparison of the GDP versus GNP figures presented in Table 1 quantifies the enormity of the profit repatriation flows that such companies create.

However, whether or not the increases in FDI in Ireland in recent times are attributable to the EU is a subject of considerable debate. Indeed, the EU Commission itself states that an analysis of the degree of success of the Single Market Programme differs greatly depending on whether one concludes the programme itself, or other factors, to have been primarily responsible for increased FDI (EU Commission, 1997). In the case of Ireland, a combination of factors attracted FDI, but my belief is that EU involvement was paramount. This position is supported by the US Chamber of Commerce in a study analysing FDI in Europe from the USA (Barry, 1999).

Why am I so resolute in this stance? Firstly, EU market integration created the scenario whereby a multinational company could serve the EU market efficiently from any base (Thomsen et al, 1993), thereby affording the low-cost Ireland the opportunity to market itself as a 'gateway to Europe'. Secondly, the aforementioned market deregulation lowered costs, increased efficiency and reduced 'obligations' throughout the EU, thus further increasing Ireland's attractiveness to foreign investors. Thirdly, the impact that Structural Funding had on our ability to deliver on the supply-side requirements of these highly productive multinationals cannot be underestimated. A final aspect warranting attention - and one that may be difficult to reconcile with the criticism currently emanating from the EU regarding Ireland's fiscal policy - is the lenience the EU has shown with respect to our low levels of corporate taxation designed to attract FDI. The rationale behind this is a grudging recognition of the questionability of enforcing uniform taxation schedules on countries of differing developmental levels.

Citing the impact of FDI in terms of employment creation and increased output is, of course the essence of any standard analysis, but I feel these elements to be so well publicised as to be somewhat trite in a commentary of such limited length. Two often overlooked benefits may prove of more interest to the reader. The first of these centres on the impact that FDI has on export led growth. By increasing our export volume so significantly, the Irish Government has thus resided over a positive balance of payments even in light of the huge increases in domestic consumer demand, and subsequent imports (O'Donnell, 2000). Such export led growth is ideal for a country so dependent on trade. Secondly, multinational companies have served Ireland well in terms of acting as incubators for would be entrepreneurs, and many of our successful indigenous companies can trace their origins back to knowledge gained from these multinationals. Any process that can strengthen the roots of business in Ireland must be welcomed, for we do live under constant wariness of the threat of the withdrawal of multinational investment.

The Future

As a new millennium dawns, so too does a new era for Ireland in the EU. No longer can our relationship with the EU be characterised with adjectives such as 'peripheral' and 'marginal', for our economic record is now rapidly converging with the EU average. What is called for is a new approach to integration, one that adapts to our new circumstances and those around us in order to create truly symbiotic relationship. Membership of the EU has clearly served us well, but the future as a wealthy member state will differ greatly from our experiences of recent times. Opportunity and challenge abound in equal measure, with the EMU programme, currently the most topical of these, generating consternation regarding the strength of the Euro currency and the continuing absence of the UK from the programme.

In light of the current displeasure in Ireland regarding stinging EU criticism of our fiscal policy, and with the day fast approaching of this nation becoming net financial contributors to the European Union, one must wonder whether an analysis ten years from now would yield such an unashamedly pro-European stance as the one I have presented in this essay.

Bibliography

Barry, F. (1997) *Dangers of an EMU without the UK - some calibration results.* Dublin: UCD Press

Barry, F. (1999) *Understanding Ireland's Economic Growth.* Great Britain: McMillan Press Ltd.

Bradley, J.; O'Donnell, N.; Sheridan, N.; Whelan, K. *Regional Aid & Convergence.* Great Britain: ESRI/Averbury Publications Ltd.

Central Bank of Ireland. *Bulletin -Winter 2000.* Dublin: CBI Publications.

Commission of the EU. *The Single Market Review; Cases of Greece, Spain, Portugal & Ireland;* Subseries 6: Vol. 2.(1997) Luxembourg: Office of Official European Commission Publications.

Foundation for Fiscal Studies (1995) *The Fiscal Impact of EU Membership on Ireland.* Dublin: Department of Economics (TCD). Gray, A W. (1997) *International Perspectives on the Irish Economy.* Dublin: Indecon Economic Cosultants.

Honohan, P. (1997) *EU Structural Funds in Ireland; A MidTerm Evaluation of the CSF 1994-1999.* Dublin: ESRI Publications.

Matthews, A. (2000) *Farm Incomes - Myths and Reality.* Cork: Cork University Press.

Matthews, A. (1994) *Managing the EU Structural Funds.* Cork: Cork University Press.

McSharry, R; White, P. (2000) *The Making of the Celtic Tiger.* Dublin: Mercier Press.

NESC (1997) *Strategy into the 21st Century.* Dublin: NESC Publications.

O'Donnell, R. (2000) *Europe; The Irish Experience.* Dublin: Institute of European Affairs.

Shirlow, P. (1995) *Development Ireland - Contemporary Issues.* London: Pluto

Sweeney, P. (1998) *The Celtic Tiger; Ireland's Economic Miracle Explained.* Dublin: Oak Tree Press.

Thomsen, S.; Woodcock, S. (1993) *Direct Investment & European Integration; Competition amongst Firms & Governments.* Great Britain: Pinter Publishers Ltd. UK. 1993.

Online references

European Community Support Framework information www.csfinfo.com.

Central Statistics Office for Ireland www.cso.ie.

Site of Economic and Social Research Institute of Ireland www.esri.ie.

Archives of EU related articles from the Guardian Newspaper Group www.guardianunlimited.com/EMU.

Official site of the Irish Business Bureau www.ibb.be.

Archives of Irish Management Institute www.imi.ie.

Official site of the Irish Government and related Departments www.irlgov.ie.

Economic survey of Ireland from May '99 www.oecd.org/eco/sur/esu-ire.htm.

The Costs and Benefits of Free Trade in the EU's Sugar Market

Shaun Heelan & Matthew O'Connor- Senior Sophister

Basic economic theory tells us that free competition is preferable to tariffs and protection. Nonetheless, many markets are marked by intervention and high tariffs, for example, the EU's market for sugar. Shaun Heelan and Matt O'Connor examine this market and use their model to analyse just how better off consumers and taxpayers would be, if liberalization of the market occurred.

Introduction

This Paper examines the price, quantity and welfare effects for Ireland and the European Union of moving from protected to liberalised trade in the sugar market. The exercise enables us to ascertain the benefits and drawbacks that inevitably occur with trade liberalisation. The phenomenon that is trade liberalisation is especially pertinent to our world today. It is currently topical to today's economics student as further WTO trade liberalisation negotiations are building on the groundbreaking work undertaken in the Uruguay Round Agreement.

However, free trade and its benefits can be quite ambiguous. Politicians need to be aware of the full implications and results of a move to free trade. Economists can provide valuable insight into this potential minefield of policy formulation by matching economic theory to a computer model to test various scenarios and their likely outcomes. This particular project, with the aid of a spreadsheet model, illustrates the effects of an imaginary liberalisation of trade on the sugar market in Ireland and the E.U. for the year 1997 (using real world data) with several given assumptions.

Although the analysis was carried out to find the effects on both Ireland and Europe, we will only present our analysis on the effect for Europe for the sake of brevity. The Irish case is very interesting, and our approach was very much the same but for one difference explained in the footnote of our second section, 'Procedure and Methodology.'

The present regime for sugar in the EU

The EU sugar regime features specific rules on prices, quotas, and trade with third countries. The present sugar regime is applicable until 1 July 2001. Community support for the sector involves a minimum price for sugar beet, which Sugar manufacturers must pay to Community farmers, and an intervention price for

sugar, at which the intervention agencies buy in all sugar offered to them by EU producers. The European Council, based on the proposals of the European Commission, annually fixes the intervention prices, which have remained frozen since 1984/85. The rules on trade with third countries entail the application of import duties to sugar from third countries and the payment of refunds on sugar exported by the EU to these countries. This system takes account of the price differences on the international and Community markets, which in our sample year (and on average) were quite large. The sugar market is characterized by tight control over production, with Producers benefiting from guaranteed prices by way of quotas, which are fixed for each country. These quotas (A and B quotas) correspond in principle to the Demand on the internal market, and to the export of excess quota sugar with the aid of export refunds, respectively. If producers wish to produce more than the amount they are allowed to under the A and B quota system, this must be exported out of the EU without refund. This excess sugar is classified as the C quota. Ireland, as a member of the EU is subject to these regulations.[1]

Procedure & Methodology

We collected our prices, elasticities and trade figures from various national, international and European sources[2]. Before advancing further, one must highlight the fact that upon trade liberalisation, we assumed the following:

> **That changes in the E.U. policy did not affect world sugar prices:** This assumption is quite unrealistic because the likelihood exists that the world price of sugar would eventually rise. To predict how much would add considerably to the complexity of the analysis. However, currently it is sufficient just be aware of the implausibility of the assumption.
>
> **Only policy in the sugar market was altered:** This is unlikely, as

[1] Source: The European Commission website (http://europa.eu.int/eur-lex/en/com/pdf/2000/en_500PC0604.pdf)

[2] Prices were taken from: IMF Commodity prices; http://www.imf.org/external/np/res/commod/table3.pdf

Quantities demanded and supplied for our sample year were obtained from FAO Statistical Databases:

http://apps1.fao.org/servlet/

Elasticities were taken from Tylers and Anderson "Dissaray in world food markets" p.375 table A4. & P.362 table A3.

international trade agreements usually cover an array of goods. However for simplicity and clarity this assumption is needed.

No compensation is paid to producers: This is also highly unlikely. Given the power and influence of the sugar lobby and other vested interests, there would no doubt be a hefty compensation payment to producers. This is an historical and political fact. Nonetheless for simplicity, we assume this will not take place.

The Marketing margin on sugar is zero:[3] This is also assumed for reasons of simplicity and clarity in results. In addition, reliable data on marketing margins were unforthcoming for both the Irish and EU case.

The Sugar market is homogenous: Contrary to the quota regime outlined above, we will assume that there is only one single sugar regime with a single price in the entire E.U. for reasons of simplicity.

These assumptions, while slightly unrealistic, are nonetheless necessary in order to build a representative and effective model. As is often said about models: "the more unrealistic the assumptions, the more valuable the results".

Our *methodology* was simple. Firstly we decided on what action would be taken. That is, full liberalisation. We then decided on our assumptions and the framework of the model. The next stage was information gathering. Information was needed on EU production and consumption of sugar, EU and world sugar prices and EU demand and supply elasticities. We gathered information from a variety of sources that are given in Table 1.

Table 1: Information Sources For Model

Data Required	
EU Production	Agricultural situation in the European Union 1998, *Page T/222; table: 4.3.4.1*
EU Consumption	Agricultural situation in the European Union 1998, *Page T/222; table: 4.3.4.1*
EU price	IMF Commodity prices; Taken from the IMF Website.

[3] The difference between the price paid by the consumer and the amount received by the farmer

	http://www.imf.org/external/np/res/commod/table3.pdf
World price	IMF Commodity prices; Taken from the IMF Website. *http://www.imf.org/external/np/res/commod/table3.pdf*
Demand and Supply elasticities for the EU	Taken from: Tylers and Anderson "Disarray in world food markets" *p.375 table A4, & p.362 table A3*

We constructed the model in Microsoft Excel. We entered equations for calculating the changes in

- Consumer Surplus,
- Producer Surplus, and the
- Change in government Revenue. (These are listed below in Table2.)

We then entered our research data and computed our findings.

This report comments on our results, both their implications and the limitations. The authors hope this shall serve as an instruction manual to those engaged in simple economic modelling in their sophister years, or as a simple guide to cost benefit analysis in policy to those in their freshman years.

Table 2: Calculation Equations Used in model.

EU 15 Countries (000's of ECU's)	Formula's Used in Model
Changes in Consumer Surplus	(EU Price – World Price)*(original EU Demand) + .5(EU price-world price)*(New world Demand – original EU Demand)
Changes in Producer Surplus	(EU Price – World Price)*(original EU Supply) .5(EU price – world price)*(Original EU Supply – New world Supply)
Change in Government (Taxpayer) Revenue	(EU Price – World Price)*(original EU Supply - Original EU Demand)
Overall Welfare Change	Sum of all three equations above.

Summary of Results

Table 3: Results Table in the EU 15 Countries

Prices as found in IMF table	(CTS/LB)
Original price (cts/lb)	*28.4*

Liberal price (cts/lb)	*11.4*
Conversion factor (cts/lb) to ($/ton)	*22*
Conversion Factor Dollar to ECU	*0.800640512*
EU Production (000's of tonnes)	*14617*
EU Consumption (000's of tonnes)	*12700*
Welfare Changes	*(000's of ECU's)*
Changes in Consumer Surplus	6024568.998
Changes in Producer Surplus	-6121753.024
Change in Government Revenue	574025.6
Overall Welfare Change	**381778.7**

In this section we outline and explain the different results we obtained with the above assumptions. Sum up the principal effects of the policy and indicate what we believe the merits or drawbacks of such a move are. We will also illustrate how one would analyse the result in a graphical format.

The effect of liberalisation in the sugar market for the EU

The figures we calculated in relation to the EU are the following:

- The percentage change in price was –59.86%
- The percentage change in quantity demanded was 67.04%
- The percentage change in quantity supplied was 29.93%

The price of sugar dropped by under three-fifths. The amount of sugar demanded by the E.U. market increased by nearly two-thirds exactly and the quantity supplied to this market increased by nearly thirty percent. Here the position of the EU, being a net exporter of sugar before the transition to free trade, is reversed due to the severe drop in price. Demand expands by nearly 70% whilst supply contracts by nearly 30%. These two opposing moves, demonstrated on Figure 1 motivate the EU to a new position as a massive net importer, as EU Demand so far outstrips EU Supply. For EU suppliers, it has become relatively less profitable to produce sugar. This is so, perhaps because some foreign countries may have a comparative advantage in producing sugar as compared to the EU countries.

It is probable that the cost structure in a foreign economy may be significantly lower, endowing their industry with lower marginal costs thereby allowing them to price their products significantly lower than EU products.

This competitive advantage may be too strong for EU producers forcing them to leave the industry.[4] Naturally, switching to the production of other outputs may become more attractive for many sugar producers, hence, supply decreases and EU consumers are forced to become an even bigger net importer. It may also allude to the malignant effects protectionism conveys to native industry insofar as it cannot compete successfully at lower prices with foreign industry that has already adapted to some type of trade liberalisation. So the amount of foreign sugar entering EU increases significantly, which carries implications for the EU balance of trade, making the EU a net importer of sugar as we have alluded to.

The change in consumer surplus (thousands of ECUs) is:

- 6,024,569.00

The change in producer surplus (thousands of ECUs) is:

- - 6,121,753.02

The changes of taxpayer revenue (thousands of ECUs) is:

- 574,025.62

The European taxpayer is no longer carrying the burden of supporting artificially high prices. The lower world price enables the consumer to consume more sugar at a given price. Again the producers bear the brunt of the liberalisation. Overall there is a net benefit to EU society. The combined gain in consumer surplus and taxpayer revenue outweighs the loss of producer surplus.

The transfer efficiency at EU level is 92.77%

In terms of welfare analysis, transfer efficiency measures the income gain to farmers or producers relative to the consumer and taxpayer costs. It is the change in producer surplus divided by the change in consumer surplus plus the change in government revenue. Effectively, whilst the protection was in place, 92.77% of the planned benefit was getting to the intended group of producers. This means over 7% of the planned transfer is lost, or a 'Deadweight Loss.'

Of course, it may be conceptually more digest-able to look at the effect of

[4] In reality this may indeed be the case especially with an industry like sugar. Major sugar exporting countries like Brazil and Cuba for example have a much lower standard of living than the EU. Resources there may be much better suited to sugar production than here allowing them to price European firms out of their own markets.

this move in a traditional graphical analysis, using the standard Supply and Demand Framework. We shall now explain the implications of the Liberalisation of trade using a graphical example. The analysis' results of the change in consumer surplus, Producer surplus and government revenue are detailed in Table 4. Figure 1 shows the picture of the move to free trade.

Figure 1: Welfare Analysis of EU Sugar market liberalisation in 1997

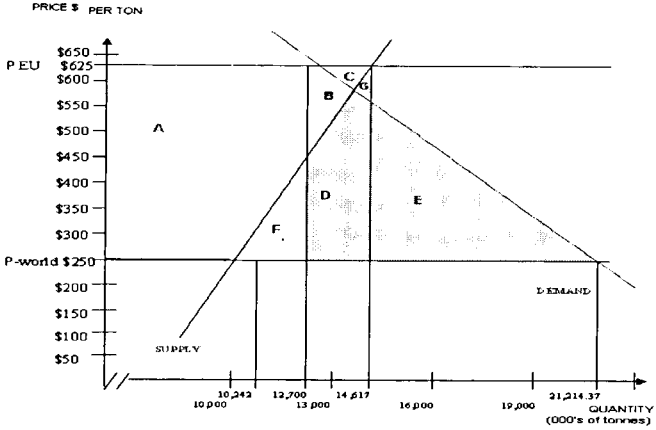

Table 4: Diagram Analysis Described

Welfare Changes	
Changes in Consumer Surplus	A+B+D+E+F
Changes in Producer Surplus	-(A+B+C)
Change in Government (Taxpayer) Revenue	B+C+D+G
Overall Welfare Change	B+2D+E+F+G

The change in consumer surplus is measured in the area underneath the demand curve between the two prices. In this case it is the sum of the areas A+B+D+E+F.

The change in Producer surplus is the area above the supply curve between the two price ranges. Here it has diminished and is a negative amount, the size of the area -(A+B+C).

The Change in government revenue is the taxpayer gain through not having to support the artificially high price on exports. Thus it is the difference in demand and supply at the original price multiplied by the difference in the two prices. This is shown as the area B+C+D+G.

In order for this to be a sound economic change, we would want to find a strong positive overall Welfare change. This happens, as the overall benefit or welfare change is shown by the area B+2D+E+F+G. According to our estimates from our model, the overall welfare benefit to European union citizens would be 381,778,700 ECUs. Thus a change towards liberalisation in this year, given our assumptions, would have been beneficial to European Citizens.

The figures above clearly illustrate that EU consumers do indeed benefit from the trade liberalisation. The welfare of our producers however drops dramatically. This illustrates why there exists such fierce resistance to any change or reform to the CAP today. Farmers are clearly aware of their fate if free trade was to be introduced.

Various lobbying bodies representing producers (including sugar lobby bodies) are constantly battling to keep their protected situation in place. "It should be no surprise that sugar producers are very effectively mobilized in defence of their protection" (Krugman & Obstfeld, 1997: 202). There exist therefore serious equity questions as to the morality of maintaining such protectionism in the EU today at the expense of the consumer and taxpayer.[5]

Limitations to our argument

All model results are based upon a number of assumptions. Assumptions must be tested for robustness in case of research error. Researchers have a habit of picking the best-case scenario to suit their hypotheses. This is known as the 'Ricardian vice' and can destroy the viability of one's results. In order to avoid this trap, one should always engage in sensitivity analysis. It acts as evidence that your results can be trusted, or, proves that hypotheses are practically void despite their theoretical merit.

However our model is based on a set of assumptions that remove the

[5] Due to the nature of financing the European Agriculture budget, the Irish government is not a net contributor. Therefore a change of this kind has no real effect on government revenue.

possibility of a negative welfare effect by moving to free trade. Regardless of this we carried out a sensitivity analysis to see how much variance occurred in the level of overall welfare change. We do this by testing our assumptions regarding the

elasticities of Demand and Supply. Our results still demonstrated a very sizeable positive overall welfare change, supporting our original results.

Conclusion

Before analysing the results of a move from protectionism to free trade on the citizens of the EU and Ireland one must consider the following; if protectionism is of benefit to society one could logically assume that a move away from protectionism should be detrimental to society. This would be illustrated as a negative welfare change in economic analysis. Our model debunked this claim. In the Irish example, the overall welfare of society increased with the gain in consumer surplus far exceeding the loss producer surplus.

In the EU case, the results were quite similar; the gain in consumer surplus and government revenue surpassed the loss in producer surplus. Our results suggest that it is in the interests of both the EU and Ireland to embrace the outside world and engage in further dismantling the barriers to free trade that in the Sugar market that exist today.

Practically speaking this is much easier said than done. The existence and continued influence that vested interests, such as the sugar lobby, wield upon policy and policy-makers are both formidable and morally questionable. Whoever chooses to champion the rights of the consumer faces an arduous and uphill struggle. As students of economics and consumers we wish them luck, as they will most likely need all the luck they can get.

Bibliography

Ellis, F. (1992) *Agricultural Policies in developing Countries.* Cambridge: Cambridge University Press.

EU Commission. 1998 Agricultural Situation in the European Union.

Krugman, P., & M, Obstfeld.(1997) *International Economics: Theory and Policy.* London: Harper Collins.

Tyers, R., & K. Anderson. (1992) *Disarray in World food markets.* Cambridge: Cambridge University Press.

Other Sources

Prof. Alan Matthews' Homepage.
http://www.economics.tcd.ie/amtthews/FoodCourse/LectureTopics/PricePolicy/Frameset13.htm

IMF Commodity prices.
http://www.imf.org/external/np/res/commod/table3.pdf

FAO Statistical Databases.
http://apps1.fao.org/servlet/Production

Department of Agriculture & Food.
http://www.irlgov.ie/daff

Central Statistics Office.
http://www.cso.ie

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The Developing Role of the ECB

Aidan Neill - Senior Sophister

With the imminent introduction of the euro, the importance of the European Central Bank seems set to grow and grow. Aidan Neill looks at the ECB and its overriding goal of price stability. He gives an overview of the theoretical issues on the subject, such as inflation targeting, and reviews the bank's experience so far. He brings his discussion to a close by advising on how best to manage the accession of more member states.

Introduction

The aim of this essay is to look at and define the general role that the European Central Bank, hereafter ECB, will play in an increasingly integrated Europe. I shall look at the design of the ECB and consider its effectiveness, both from the theoretical and empirical points of view, in particular focusing on the Maastricht Treaty statutes. From this initial perspective, I shall go on to look at the first experiences of the ECB and the role it has played thus far in the Euro-land economy. Finally, I will span the bridge towards the future, and look at the role of the ECB when further advances in economic and monetary integration will have taken place.

Theory and Design of the ECB

If we look at economic theory, and in particular the Barro-Gordon model, analysis suggests that high-inflation countries have a lot to gain economically from monetary union, in particular if it is combined with strong political independence. On the other hand low-inflation tending countries have nothing to gain.[1] This very defined asymmetry is clearly important in the design of the ECB. If Germany, as a low-inflation country, is to have any incentive to join a monetary union, then the ECB will have to be at least as focused on low inflation as the *Bundesbank* has been. Noticeably, the Maastricht Treaty statutes clearly incorporate this idea. In the creation of these statutes two main principles are implemented (which are also the key to the *Bundesbank* statutes).

[1] The model emphasises how economic agents employ optimal strategies in reply to authorities' policies. These private sector responses influence the effectiveness those policies. In particular, governments' reputations in pursuing announced policies have a large impact on how these policies are going to affect the economy.

The first of these principles is that the primary objective of the ECB is the maintenance of price stability. The second principle is that of political independence, which is seen as a necessary principle for the first. It is seen as a necessary condition so that the printing of money will not finance budget deficits of national and European governments. Empirical evidence, to which I shall refer later, makes clear that it is inevitable that a government influenced central bank will be forced to finance budget deficits, which is a guaranteed way to cause inflation. The Treaty itself can be quoted to identify its focus on political independence:

> *"When exercising the powers and carrying out the tasks and duties conferred upon them by this Treaty...neither the ECB nor a national central bank, nor any member of their decision making bodies shall seek or take instructions from Community institutions or bodies, from any Government of a Member State or from any other body."*

De Grauwe (1997) suggests that the language used by the drafters of the statutes of the ECB is harder on inflation and political independence than the statutes of the *Bundesbank*. This would suggest that the drafters were aware of the asymmetry in incentives to join European Monetary Union. The political independence of the ECB will probably be stronger than that of a national bank like the *Bundesbank*, anyway, because of the sheer difficulty of obtaining changes in the statutes. A simple majority in the German parliament can change the statutes of the *Bundesbank*, whereas changes in ECB statutes can only occur through revision of Maastricht guidelines, which requires unanimity across EU authorities.

Possibly Germany was influenced in its decision to join EMU by these principles; this does not necessarily mean that they are desirable. Much theoretical and empirical evidence has convinced many economists that these principles are desirable. I shall discuss possible problems of the Maastricht strategy at a later stage.

At this stage, it is important to clarify with empirical evidence the strategy behind these principles. As commented, the principle of political independence of the ECB is apparently crucial to the ability of the ECB to maintain price stability. Much empirical evidence would suggest that this is true. Notably a regression analysis of 21 industrial countries by de Haan and Eijffinger (1994) identified a clear negative relationship between inflation and independence of central banks.[2] The regression sought to quantify the extent of independence, with each country's

[2] The regression had the result: Inflation = 11.2 – 9.4 independence; R-squared = 0.88

'independence' being rated between 0 and 1 (1 representing 'wholly' independent). The reason for this relationship is identified as political 'short-termism'. It is clear that governments seeking re-election may seek to lower unemployment close to election times and sacrifice the focus on inflation for a time, thus damaging any reputation for anti-inflationary policy it previously had. As a result, it is suggested that monetary policy should be put under the authority of an independent organisation.

One criticism of this analysis is that it is not clear whether the independence rating is an accurate guide. Research by Posen (1994) suggests that both inflation and political independence are the result of deeper running social and economic interests, such as the extent and power of economic pressure groups. So how 'independent' a central bank is may not be merely a function of actual political independence. As a result, even though the statutes of Maastricht may be even tougher on inflation than the *Bundesbank*, actual policymaking may deviate from this apparently hard line. This is due to a social and cultural interpretation of inflation. Some of the ECB's decision makers will come from countries whose dislike of inflation is not as intense as Germany's. Convergence criteria do not, therefore, give Germany a guarantee that EMU will produce price stability.

This, however, is the key role of the ECB and therefore it needs to be strong with incentives for low inflation in place. The Maastricht Treaty criteria fail in the respect of making the ECB accountable for poor performance. The *Bundesbank* is far more accountable than the ECB, as there exists a law describing the responsibilities of the *Bundesbank*. This can be changed by majority vote in the German parliament, which is largely representative of societal interests. In this respect, the ECB has the role of making itself strong with incentives for low inflation, holding its hands up if it fails on price stability credentials. Christian Noyer, the ECB vice-president, recently commented, "The Euro system has chosen a clear and transparent monetary policy strategy with quantitative definition of its primary objective of price stability."

I shall identify the nature of this 'clear and transparent policy' later, but the key point is that in the role of maintaining price stability the ECB needs to adopt harsh disincentives for poor performance. A New Zealand style policy of introducing penalties to central bank law needs to be run by the ECB: failure to hit the targets in New Zealand can lead to the removal of the governor of the central bank. Other possibilities include the reduction of salaries and demotion.

Other incentives will come as a result of direct action by the ECB, through the implementation of reforms of EMU country budgetary processes, to make them less prone to unsustainable budget deficits. The "stability pact" agreed in Dublin, 1996, aims at implementing this sort of mutual control between national financial institutions and the ECB. Another complementary approach put forward by Eichengreen and von Hagen (1995) is the streamlining of budgetary processes in the European Union. The suggestion involves instituting National Debt boards in each country, which would monitor and react to the growth of debt. Clearly the role for the ECB here would be as overlord to these, imploring strong budgetary processes.

The choice of inflation target

Having established that the key role for the ECB is the maintenance of price stability, the ensuing question is at what level inflation should be maintained. Theoretical approaches to answering this question have come up with differing conclusions. In the 1950s, Friedman suggested that the optimal inflation rate was zero because that level maximizes the total utility of holding money. Against this there are several considerations.

Firstly, there is evidence to suggest that conventional measures of inflation tend to overshoot the true inflation rate by around 1-2%. Also, the calculation of the inflation does not account for quality improvements. The price of a computer in 1980 is roughly similar to that now, but the price per unit of computing power is far less than that in 1980. As a result, a zero inflation rate may in reality be deflationary.

A second issue is that sectoral or micro-economic shocks require adjustments in real wages. If demand in a sector falls necessitating a reduction in the real wage rate, it is possible, if inflation is positive, to continue increasing the nominal wage rate at a rate below inflation thus achieving the desired effect. There is a lot of evidence that reduction in the nominal wage rate is very difficult. Keynes commented on this issue saying, "Wage rates are sticky downwards." Employees don't accept wage reductions easily, especially in a nominal sense.

In an environment of zero inflation, the increasing wage rigidity makes adjustments to asymmetric sectoral shocks difficult to achieve. In a recent speech (Feb '00) to "le Club des Affaires de Berlin e.V." the ECB vice-president Christian Noyer talks of the ECB inflation target:

"Price stability is defined as an annual increase in the Harmonised

Index of Consumer Prices (HICP) for the euro area of below 2%. The Eurosystem aims to maintain stability in line with this definition over the medium term."

Clearly the fact that Noyer is speaking to a German audience makes the emphasis on low inflation understandable. Perhaps, however, the target rate of inflation is too low compared to the optimal one, particularly on a Euro-wide basis. If we are to believe the analysis above, a 2% inflation rate may be zero in truth. Such a low inflation target will increase the risk of drawn-out deflationary monetary policies and a reduction in the already rigid level of real wage flexibility. The Treaty does not really stipulate who should determine the target of inflation, rather it stipulates the pursuit of price stability. This is an issue that needs to be resolved. It is not a major issue at the moment because growth is strong, the euro is weak and oil prices are stabilizing (following recent OPEC announcements of increases in supply), although the cracks are appearing.

The issue is that most societies expect the central bank not to abandon completely the ambition of stabilizing the economy during downturns in growth. With each recession pressure will build to relax its monetary stance, particularly from regions where there is low labour market flexibility. Thus the role of the ECB in this respect is to be all things to all nations, clearly a very difficult undertaking. Problems with this 'one size fits all' monetary policy are already being seen. Recently the euro slumped to new lows against the dollar, sterling and the yen as investors responded nervously to mounting evidence of economic strains within the euro area caused by the unilateral monetary policy of the ECB.

The proverbial whistleblower in this regard was the Central Bank of Ireland, which has warned that inflationary pressures are building up rapidly against a background of excess domestic demand and rapid growth. The Irish economy grew by 8.25% last year and is likely to achieve similar this year. The warnings of the bank coincide with crippling transport strikes with wage demands of 20% on top of an already generous three-year deal between government and unions. Also with further recognition of accelerating wages, increasing service sector inflation and sharply rising property prices, it becomes apparent that the 3.5% interest rate applicable across the eurozone is well off the mark required in the Irish context. Some estimates suggest that Ireland needs interest rates closer to 8% to dampen the possible inflationary effects of the present economic situation.

The ECB has pushed up interest rates in the recent period. In its statement,

following the increase by 25 basis points, the ECB said that euro-zone economic conditions were better than at anytime in the past decade. Economic growth, the general weakness of the euro, oil price rises and excessively strong credit growth were all cited as reasons for the rate move. Suggestions have been made that we will see further rate rises in the next couple of months, but with recent OPEC announcements of increases in world oil supplies dampening the apparent inflationary pressures these rises may not occur. This leaves Ireland in a situation where interest rates are too low to maintain price stability in the long run. Clearly Ireland is not the only country in the EMU 11 that is not suited to the ECB 'one size fits all' policy.

Unlike German unification, EMU has preceded political union. This makes it necessary to introduce additional features in the framework of EMU so as to enhance the co-ordination between monetary and economic policies. For example the establishment of the Stability and Growth Pact fosters the co-ordination of fiscal policies among Member States on the basis of fiscal rule. One of the roles of the ECB in the future is in the co-ordination of fiscal policies, and help countries into the 'one size fits all' monetary policy.

Towards the future

There are important conditions to be met in order to achieve sustainable non-inflationary economic growth in the euro area. In particular, decisive measures to address the structural problems in Europe are needed, for example in the area of labour markets. As Romano Prodi, President of the EU Commission, in a speech to the EP (February 2000) recently commented:

> *"Even if we see some progress in reducing unemployment in the euro area over the recent months, the structural problems in Europe are still pressing."*

There is clearly no doubt that these problems need to be tackled by policies enhancing the flexibility of Euroland's labour and goods markets. Christian Noyer ("The short past and the long future of the Euro," Feb., 00) continues in this vein:

> *In coming years, the success of EMU demands that the division of policy responsibilities between monetary and government authorities, as set out in Maastricht, is followed. This allows the eurosystem's monetary policy to focus on its primary objective.*

At the same time as this, economic policies can be directed more efficiently towards structural problems prevailing in individual Member States. This sharing of tasks is transparent and therefore conducive to accountability, which will enhance the credibility of monetary and economic policies in Europe.

The focus on price stability does not allow the conditioning of monetary policy actions upon the prospective results of fiscal and structural measures. Similarly, monetary policy cannot be conditional on future wage developments promised by the social partners. It could be conceived that society could interpret such a form of policy co-ordination as the attempt to negotiate the ECB's monetary policy stance with other policy-makers. This might hinder the Eurosystem's direct response to shocks that threaten the maintenance of price-stability.

In the future, the EMU will see the accession of a number of new Member States. These new entrants will need to be subject to rigorous implementation of the 'convergence criteria' on a sustained basis. Exchange rate stability is also a measure of overall convergence, given that exchange rate movements typically reflect, in addition to market expectations, relative movements of economic variables. In this regard "...participation in ERM II fosters convergence for prospective euro area members."

The introduction of the euro in other countries will again require more than just compliance with the convergence criteria. Statistics need further adaptation so as to comply with the Eurosystem's reporting requirements and some changes in national legislation are needed to formally lay the foundations for the introduction of the euro. And "all procedures that involve the Eurosystem and the prospective member country will have to pass a number of real-time tests in order to demonstrate that the infrastructure is operational" (*ibid.*).

Conclusions

It is clear that the ECB will continue with the idea that stable prices are the best contribution monetary policy can make to sustained economic growth in the euro area. Maintaining price stability should continue to contribute to the credibility of the single currency, and can "...pave the way to a long future for the euro." Having said that the real issues for the ECB are in the 'one size fits all' nature of its monetary approach. The ECB should be blinkered in its approach to achieving price stability and not buckle under social pressure to relax monetary policy. Relaxation

of the approach will have adverse consequences in the long-run. The ECB does, however have an important role in the transition of countries towards this united monetary policy. It needs to be very clear and transparent about all monetary policy. Continued work needs to be done implementing strategies like the Stability and Growth Pact to truly integrate countries into the union. It is going to be a long a difficult journey as many social and cultural changes may be required to fulfil the process.

It may be the case that properly designed monetary institutions, by adjusting the preferences of the ECB, may substitute for entrance requirements and other surveillance techniques (see Beetsma 1995). It would be interesting to explore in more depth what determines the optimal combination of, on the one hand, adjusting policy preferences of the ECB, and on the other hand, constraining national fiscal policies.

Bibliography

Beetsma, R.M.W.J & A.L. Bovenberg (1995) *Designing Fiscal and Monetary Institutions in a Second-Best World.* London: Centre for Economic Policy Research.

De Grauwe, Paul (1997) *The Economics of Monetary Integration.* Oxford: Oxford University Press.

Eichengreen, B, "European Monetary Integration" *Journal of Economic Literature.* 31 (1993: 1321-57)

Eichengreen, B. & Von Hagen, (1995), *"Fiscal Policy and Monetary Union: Federalism, Fiscal Restrictions and the No-Bailout Rule"*, CEPR Discussion Paper, No.1247.

Krichel, T., Levine, P. & J Pearlman (1994) *"Fiscal & Monetary policy in Monetary Union: Credible Inflation targets or Monetised Debt?"* University of Surrey.

Mundell, R (1961), "Theory of Optimal Currency Areas" *American Economic Review.* 51 (1961: 657-65).

Suiter, J. 10/03/00 Irish Times *"Lenders will pass on latest ECB interest rate rise".*

Segall, A. Daily Telegraph: *"Central Bank blamed as euro slumps to new low".*

Punks, Historians and Free Bankers: Strange Comrades?

Tom Lyons – Senior Sophister

Many would see little connection between punk rockers and the advocates of a free banking system. Nonetheless, in his lively style, Tom Lyons describes such a connection before analysing the performance of free banking systems throughout history. He concludes that judgements on the system have been harsh, and sees a role for free banking in promoting stability in emerging markets.

Introduction

"If economics is not to remain the victim of history...it must develop or rediscover...historical perspective."

E.J. Hobsbawn, 1997.

"We don't see eye to eye, but we have a common interest: your money."

Johnny Rotten, announcing the reunion tour of the *Sex Pistols*, 1996.

Nobody quite knew what to make of the *Sex Pistols* when they first started playing in basement strip clubs in Soho. Ripped clothed and wild-eyed, they scarred their skin with glass and spat at the crowd and critics. In between, they fought each other. Some said they would bring anarchy. Others felt they were swindlers. A few thought they had something to say. They saw them as cynical challengers of accepted truths. With blunt lyrics they attacked the status quo with insight. In doing so, though they might not have recognised it, they drew on a much older culture of protest that grew in the mines, the streets, and the factories.

Except for the strip clubs, clothes sense and self-mutilation the free banking movement is the modern economic equivalent of a punk rock band. They have faced similar name-calling and have a similar fascination with our money. It is in the spirit of free banking writers such as Selgin, White and Glasner that parallels with punk rock are most distinctly seen. They contest convention, reinvent themselves and propose an alternative. They are also rooted in a long tradition, hence the quotation from Eric Hobsbawn. Hobsbawn contends we must integrate the past into our view of the future. The interface between Free Banking experience and theory is one aim of this essay.

How would a monetary and banking system operate under laissez faire?

An answer to this question is essential for a proper, critical understanding of the effects of government intervention in the monetary system. Just as it would be impossible to understand the full implications of restrictive tariff policies without reference to a theory of free trade, so too is it impossible to understand the full implications of legal restrictions in banking without reference to a theory of free banking, an understanding that is crucial both to understanding monetary history and to making predictions concerning the likely consequences of future deregulation and financial innovations.

What is meant by Free Banking or Six Nos (Make a right?)

Free banking is, perhaps, best defined by six negatives. At its most explicit Free Banking is a situation where there is:

- No governmental control of the quantity of the exchange medium.
- No state-sponsored Central Bank.
- No legal barriers to entry, exit or branching to the banking system.
- No restrictions on the quantity, type or mix of debt and equity claims a bank may issue or hold.
- No government deposit guarantees.
- No restrictions on the terms of contracts between banks and customers beyond standard legal practice.[1]

This brief synopsis needs development. The definition of Free Banking has not been historically or theoretically static. In the 19th century it was more likely to mean free in the sense of entry being possible without legislative charter. At one extreme Free Banking has arisen entirely free of government interference. Most notable, were Belgium (1835-1851), Bolivia (1887-1914), France (1796-1803), Rhodesia (1892-1939) and Thailand (1888-1902). In the middle lies the most studied groupings which exhibited many but not all of the characteristics of pure Free Banks. Scotland (1716-1845) experienced the constraints of a usury ceiling of 5% and a ban on small denomination banknotes. Canada (1817-1914) had a dual scenario where government and Free Banks both issued. Australian banking (1817-1914) was limited only by barriers to interprovincial branching and government legal tender issue. At the other extreme lie numerous situations were a few Free

[1] Adapted from Selgin & White (1994) p. 1718-1719.

Banking characteristics were co-opted.[2]

Selgin and White (1994) make three distinctions within Free Banking. Firstly there is a school that advises unregulated money and banking with a distinct base money possibly made up of metal, private monies and traditional banknotes and transferable deposits redeemable in base money. This is the school most recognisable to the nineteenth century. Free Banking supporters. The second school advocates plural brands of non-commodity base money issued by private firms. This basically means competitive systems of money between parallel private fiat type monies. Finally there is the "New Monetary Economics" or "Legal Restrictions theory". This comprises a competitive payments system without any base money and a common media of exchange consisting entirely of claims paying competitive rates of return on banks or money-market mutual funds. These three schools show Free Banking has no single meaning but contains a shared desire to revise the current paradigm.

1970s

Von Hayek's *Denationalising Money* (1978) provided new impetus to the debate. He wrote in the context of Public Choice Theory and an inflationary period. Institutions allow democratic governments monetize debt and use deficit finance to retain electoral power. The Central Bank, von Hayek argued, facilitated this process. Studies of the pre-Civil War U.S. "free banking era" by Hugh Rockoff, Arthur Rolnick, and Warren Weber around the same time showed that this regime was far more successful than had previously been supposed. Selgin, White and Glasner also began to break onto the scene (as did the Pistols).

"Filthy Lucre"[3]

Free market economists treat money as the big exception. There is a mentality that has arisen among economists since the Great Depression that has had too much experience with managed systems. Episodes of free banking are treated as interesting oddities or, worse, only of interest to antiquarians. Banking, it is felt, has a special status and must be insulated by regulations, centralisation and hierarchies.

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[2] Dowd (1992) provides the best available survey I have read.

[3] 1996 reunion "funding" tour by the *Sex Pistols*. Artistic shambles, minus Sid Vicious, yet very much an economic success.

It is felt the market has proven itself insufficient. The price of efficiency gains has been increased risk, it is judged. Free Banking has been accused of causing inflation, prone to suspend convertibility, destabilising, maintaining too low reserve ratios and having few redeeming qualities. The business of creating and maintaining filthy lucre is best left to Central Banks. This has not been the historical experience.

The desirability of rules or discretion for monetary authorities has been much discussed. The rational for having these authorities at all has been relatively neglected. As Vera Smith notes, "to suggest its abandonment is to invite ridicule"(1984: 137). It may be time to invite "ridicule" by defending free banking.

Free banking has not been proven to be inflationary. In all historical cases free bankers anchored themselves to real commodities. They thus had only a limited ability to effect prices. The price of the anchor commodity is what really deserves attention. The fact that gold, the anchor of choice, proved of fluctuating value and led to instability does not condemn free banking but rather condemns the wider scheme of monetary thought. This is a fact recognised by John Law, whose system's unfortunate failure would prove a major setback in the search for a more reliable commodity bundle.

Further, no Free Bank chose to abandon convertibility. This was always a decision forced by government. As Dowd concludes, *"the claim that competition among unregulated banks would lead to an explosive money supply and rapid inflation has no support in historical record"*(1992:3). The over-issue of notes was not profitable when rapidly returned through the clearinghouse system draining reserves. The Ayr bank failure is a case in point. Scottish authorities did not fold and sanction suspension of convertibility easily so there was no incentive for periodic over-issue. The one general suspension followed not from local over issue but was enforced at the Bank of England's request.

Equally, the destabilising argument has little historical basis. Clearing house systems disciplined over-issuing banks by providing a reflex mechanism to return excess notes and deposits to their issuers. Further there is no evidence of interest rates being unstable. Finally without lenders of last resort they tended to prudence, wildcat banking has been greatly exaggerated.[4] As Dowd (1992) points out the real contagion effects came not from with the free banking system but from

[4] Rolnick & Weber (1983) have shown for the U.S. evidence of wildcat banking is largely anecdotal. Note issuing regulations may even have facilitated wildcats.

without. This can in the effect of crises in London and New York destabilising Scotland and Canada retrospectively. In the US case crises came from outside requirements to hold state debt.[5]

The Scottish experience also supports the proposition that under free banking required reserve ratios will not go too low. All but three of Scotland's banks maintained unlimited liability. Rapid growth indicates a more optimal amount of banking risks was undertaken. Note holders and depositors chose for themselves the risk they wished to assume. Even in the 1860s/1870s when limited liability became available the unchartered banks of Scotland chose not to accept. Scotland never experienced the kinds of internal drains experienced in England due to unsound practices fostered by legislation. The Scottish public trusted their banking system not to abuse reserve ratios. *"The Scottish system was based on confidence, the British on fear"*(White, 1984: 142). More generally the historical evidence seems to argue Free Banks suspended less frequently then banking under a Central Bank system (Schuler & White, 1992).

To prevent spillovers, banks tried to establish brand reputation just as with consumer durables. This discouraged over-issue and quick seignorage gains. Modern Central banks have no such incentives; indeed the Federal Reserve makes some $20 billion dollars per annum by this method, a method that is unlegislated and for which the Fed is practically unaccountable. Legal tender forces acceptance and allows good money drive out bad.

In answer to how close Scotland approximated free banking, White (1990) notes that while chartered Scottish banks may have earned small rents this was not enough to seriously impede competition. Nor was the Bank of England a shadow Central Bank for Scotland as alleged (Cowen, Krozner, 1989). It did not act as a lender of last resort prior to 1844 nor did it provide a reserve base of high-powered money prior for Scottish banks except during the restriction. Scottish banks may have used the London financial markets to meet occasional liquidity problems but they did not lean on the Bank of England. The accusation of Scottish Free Banking being puppets is an exaggeration.

Further Free banking would remove the elasticity of the money supply problem. For example consider the problems of 1929-1933. An increase in the demand for currency at the expense of checking deposits causes banking reserves to

[5] Dowd (1992) finds the only exception to this may be Australia.

fall and credit to contract, so there is a decline in the total money available. This problem would not exist under free banking as currency and deposits would be on the same footing.

On the contrary, Free Banking has tended to innovate. The Free Banking era in Scotland (1716-1845) saw the pioneering of the cash credit account, a forerunner of the overdraft as well as the payment of interest on deposits. Branching too brought economies of scale as well as pooling risk. Finally it should be noted Scottish per capita income in 1745 was half of England's. A century later it was almost equal despite England's rapid growth and despite Scottish resource and location disadvantages. Only in education and in its banking system had it the edge. This seems a powerful argument in favour of Free Banking, which the more broad research of Cameron (1972) supports. At the heart of opposition to Free Banking is however the threat of bank runs and over-issue. It is to these charges towards which I will now turn.

Bank Runs

As one Hindmarsh director recalls talking to an old man who despite government intervention still insisted in withdrawing all of his money from his account. *"The old man said 'Mate, I couldn't afford to take the chance – it's all I've got.'"* Free banking envisages an interbank market that when runs occur funds will move from weak to strong institutions. This being done, deposits can then be recycled back, via interbank markets, to banks under attack. The Hindmarsh case, in Australia commencing in October 1974, illustrates the danger of a drain of cash to under the mattress holding accounts (Lewis, 1996). Free banking creates a fear not based so much on explicit theory but on disastrous events. Artificial barriers are under pressure from innovation so old fears about free banking are resurfacing. At the heart of this fear is a real threat that of bank runs.

How real the threat of crisis is, from contagion effects leading to endemic bank failure under Free Banking, is another matter. Diamond and Dybvig (1983) show a run on a solvent banking system can arise from individual mistakes by the public but also from well-informed rational behaviour. If each agent expects the other to redeem his claims against a bank, it is rational to follow. A bank run becomes self-fulfilling. Free bankers believe self-interest will create contractual arrangements to counteract such contingencies. Clearing houses could assume lender of last resort roles as in the American National Banking System before the Fed.

Option clauses as used in Scotland before they were banned in 1764 could be used to delay redemption at a cost of paying interest.[6] Finally deposit insurance could be used to safeguard against extraordinary demands. I will look at this last case in greater detail.

After Federal Deposit Insurance (hereafter FDI) was introduced in the US it was certainly true the number of bank failures fell to virtually zero. In 1933 4,000 banks failed. Since 1934, never more then 100 failed, in fact between 1943 and 1974 bank failure rates in the US were in single digits (Glasner, 1998a). Does this mean the US has mastered banking or is something being brushed under the carpet? This seems likely. Insolvent 'zombie' banks continue to operate as they carry assets at their book rather then market value. Information is kept from the public with problem banks being merged away. This intensifies moral hazard, encouraging devil-may-care attitudes. The bank is literally betting. For fear of bad headlines and political discomfort, the US banking system seems to be playing a sophisticated game of Jenga. Writing in 1932 the Chicago Clearing House Association showed foresight when it wrote *"[The national guarantee system] proposes to tax good banks to support bad..."* (Glasner, 1998a: 181).

The current system encourages risk and moral hazard though it may well prevent runs. Provided Central Banks can supply enough money, runs need not take place. The price of this is future taxation and inflation. Innovation may offer a safer more efficient alternative without FDI.[7] Loss of confidence leads to dangerous bank runs because depositors have fixed nominal claims they are entitled to redeem on demand. Money-Market Mutual Funds (MMMF) *has "introduced a run-proof monetary instrument,"* (Glasner, 1998a: 195). The argument goes that a shareholder does not have a fixed claim. If the value of a fund falls this is felt instantaneously, so there is less incentive to cash them in then with fixed deposits. As part owners, there is less incentive to induce a run. Depositors should deal with the bank that most fits their risk profile. If they wish to avail of keenly competitive service, they should deal with free banks, but if they would rather security, they can deal with banks with close to 100% fractional reserve ratios.

[6] Sweden also used such clauses, during its Free Banking era 1831-1902 and not a single bank failed or was suspended.

[7] See Glasner (1989a) chpt. 9 for discussion of how this might occur.

Reform is not enough. Adjusting premiums will not work due to lack and lags in information. Thus when it becomes clear a bank has been imprudent, increasing the premium will not only aggravate the situation but may well induce failure. Finally, FDI agencies are heavily politicised as a result of being government agencies as van Hayek (1978) earlier pointed out.

Overissue

Smith, Thornton, Ricardo, Mill and the Banking School in contrast to the Currency School denied competitive banks would over-issue, so long as they had to convert their obligations into an outside asset at a fixed exchange rate.[8] The modern Free Banking position has changed little in this respect.

Criticism of free banking is on two fronts: firstly on the liability, and secondly on the asset side of bank balance sheets. Competitive banks have an incentive to over-issue liabilities as they fight for market share. The argument, then, contends that this over-issue of bank notes or deposits increases public spending. This causes money to depreciate driving up prices. Under the Gold Standard, a drain in gold reserves would place a sharp break on the economy under a fiat-based system this would continue until the Central Bank steps in to restrict credit.

However this simple cause-and-effect narrative assumes banks always find it profitable to expand at the margin. But as Glasner (1998a) points out, this could only be the case, if banks were not paying competitive interest rates on these liabilities. If they were there would be no incentive to over-issue. This undermines one of the key arguments against Free Banking. Glasner goes further however in asserting that FDI does the opposite of what it was intended for. It is a destabilising force, which props up established banks almost no matter how poorly they are managed. It is a servant of banking cartels not the public. Unlike any other form of insurance, FDI insurers do not adjust premiums to reflect risk, thanks to a congressional ruling. The moral hazards this creates are a mainstay of the Free Banking literature. It means that regulation assumes control. However its objectives are diluted by additional legislation, which prevents diversification and forces uneconomic loan making rather then focusing on punishing imprudence. This situation is by no means limited to the US.

As a postscript, Hayek in 1937, reintroduced the idea of privately issued

[8] See Cassidy (1998) for a discussion of their differences in this debate.

currencies acting as a discipline upon over issue by governments. He imagined competition forcing authorities to improve the quality of government money or face extinction by market forces.[9] This is an interesting idea, but if private issue proved more efficient, perhaps due to the ability to focus less on political concerns, how long would it take governments to find a suitable reason to interfere?

"No Future...?"[10]

"If it ain't broke, don't fix it"-conservatism will probably continue to prevail. As long as inflation remains low and the banking system is not collapsing, the potential benefit from reform is not big enough to outweigh the perceived risk from trading the monetary system we know for one we don't.

But the case for some measure of Free Banking in Less Developed Countries and former Eastern Bloc needs to be considered:

There, the banking systems often lack the stability necessary for development. Without secure monetary institutions, these countries have far more to gain by experimenting with introducing some elements of free banking. Free banking is suited to overcoming the systemic problems that now frustrate the attempts of LDCs to achieve monetary stability.

The reason is a private issuer of inside money has more credibility than a sovereign issuer of inside money, because people understand a sovereign has less to lose than a private bank by reneging on a convertibility commitment. A defaulting bank forfeits its assets to its creditors while a devaluing government has less to lose.

Unless the new currency, upon introduction, is made convertible into an accepted medium of exchange, the consensus about its future value required for a fiat currency to serve as money may be lacking. LDCs cannot create stable monetary systems based on inconvertible fiat currencies, because their political regimes lack

[9] Lewis (1996) pp. 3-4. He also made a distinction between holding and using money. Government money would be used for transactions but people would not be willing to use it as a store of value in preference to private issue. He preceded Glasner is envisaging this issue to be pegged to some commodity basket valued by consumers.

[10] Lyric taken from "God Save the Queen," *Never Mind the Bollox* (1977) by the *Sex Pistols*.

the credibility to impose stable monetary institutions by fiat. Lacking widely accepted money about whose future value expectations are secure, such regimes cannot create acceptable money out of thin air, because they cannot impose a consensus about the future value of a fiat currency.

New fiat currency often bring a hyperinflationary environment, because with no public confidence in the future value of the currency, the public will be willing to hold very little of it. This does not mean that demand for money of any kind is small. The demand for a stable money in which people had confidence would be much greater than the demand for a new fiat money. An attempt to force more than this small amount into circulation, say, to finance the government deficit, causes rapid inflation. And the inevitable attempt to overreach the limits of that revenue source by printing even more money triggers a vicious inflationary cycle that causes a complete monetary breakdown.

All Money is not equal

Our models make two assumptions that lead to misguided policies for LDCs/East:

1. They assume that all money is alike, so that there is a given demand for money, which any instrument so designated can satisfy.
2. They assume that total output is independent of the amount of money. Not all moneys are equal and an inferior money in which people have no confidence cannot perform the services that a superior money could.

Moreover, while money serves as working capital for households and businesses and adds to their productivity, monetary stability provides a kind of intangible infrastructural capital that adds to the productivity of all economic agents independent of the amount of money they hold individually. Policies aimed at achieving monetary stability in developing countries by restricting the quantity of the available fiat money treat a minor symptom but ignores distrust of the available money makes it useless and deprives the economy of desperately needed monetary services.

Thus in such circumstances free bankers argue the only feasible way to create a consensus about the future value of a currency is to make it convertible into another money, e.g., the dollar, about whose future value expectations are secure.

Governmental commitments to establish and maintain convertibility, (see Mexico), are obviously not always credible, because a sovereign that defaults on such a commitment faces no effective sanction. Devaluations are thus a dime a dozen.

Nevertheless, given sufficient reserves, and given some institutional constraints on money creation and on government borrowing, governments can maintain a fixed exchange rate for a limited time. With sufficient resolve, they may do so indefinitely. However, such pegs are fragile. Once a shock occurs, the expectation of a future devaluation becomes almost irresistible even for a developed country.

A currency board whose sole function would be to issue domestic currency in exchange for an equivalent amount of some foreign currency in terms of which the domestic currency would be defined is then usually suggested. Such a system, if maintained, converts the domestic currency into a denomination of the foreign currency in terms of which it is defined. However, currency boards have found it difficult to avoid being politicised.

For the above reasons Free Banking is well suited for less-developed and former Eastern Bloc countries. By making the commitment to maintain convertibility, one which holders of money can enforce through legal means against private banks instead of one that can be abrogated by the government or Central Bank at will, free banking avoids the barrier that sovereign irresponsibility places in the way of creating monetary confidence.

Under free banking, private banks would be allowed to issue currency (banknotes) and create deposits denominated in units of their own choosing. Thus, if the public wished to use dollars, free banks would be willing to create money denominated in dollars. However, since there would be legal problems in issuing banknotes denominated in dollars, free banks would instead define new denominations (say, the crown) in terms of dollars (one crown equals one dollar), so that prices could be quoted interchangeably in either dollars or crowns. Because it would allow private banks to supply the hand-to-hand currency needs of the public, free banking would be preferable to simple dollarization which would require a country to import the dollars required for hand-to-hand circulation by means of a costly export surplus.

Conclusion

An interventionist dynamic has been unleashed in banking in the developed world. This has not always historically been the case nor have alternatives been necessarily failures. Technology increasingly is introducing into the banking system elements of free banking. It is thus vital that economic theory respond by studying the issue if for no other reason then that vulnerable emerging economies can learn from our mistakes. Johnny Rotten these days is more a celebrity then a rebel. Free banking ideas too must prepare for integration into the mainstream while trying to maintain its punk vitality.

BIBLIOGRAPHY

Cassidy, M.J. (1998) *John Fullarton and the Development of Classical Monetary Theory*, Dept. of Economics, University of Dublin, Trinity College.

Diamond, D.W. & Dybvig, P.H. "Bank runs, deposit insurance and liquidity" , *Journal of Political Economy.*91.3 (1983: 401-419).

Dowd, K (1992) *The Experience of Free Banking.* London: Routledge.

Glasner, D. (1989a) *Free Banking and Monetary Reform.* Cambridge: Cambridge Univ. Press.

Goodhart, C.A.E. "Why do banks need a Central Bank?" Oxford: *Oxford Economic Papers.* 39 (March 1987: 75-89).

Laidler, D. (1992) "Free Banking Theory," in Newman, P. Milgate, M. & Eatwell, J., (ed.), *New Palgrave Dictionary of Economic.* London: Macmillan Press.

Lewis, K. The Myths of Free Banking. *Univ. of Nottingham Discussion Papers Series in Economics.* 96.14 (1996).

Rolnick, A.J. & Weber, W.E. "New Evidence on the Free Banking Era," *American Economic Review.* 73.5 (1983: 1080-1091).

Schuler, K & White, L.H. (1992) "Free Banking" in Newman, P. Milgate, M. & Eatwell, J., (ed.), *New Palgrave Dictionary of Economics*. London: Macmillan Press.

Selgin, G.L. & White, L.H. "How would the invisible hand handle money?" *Journal of Economic Literature*. 32.Dec (1994: 1718-1749).

White, L.H. "Scottish Banking and the Legal Restrictions Theory: A Closer look". *Journal of Money Credit and Banking*. 22.Nov (1990: 526-536).

A comparison of the Philosophies of John Law & Georg Simmel

John Kelly - Senior Sophister

John Law, the 18th century theorist, is often remembered for his failed policies in France. John Kelly however, seeks to restore his profile as a theorist. He compares the work of Law to the philosophy of George Simmel, concluding that Law, as a theorist on the issue of money, was ahead of his time.

The difficulty lies, not in the new idea, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds.
John M. Keynes – ***The General Theory of Employment, Interest and Money***

...it is no argument against any thing propos'd for the general good, to say it is new, and what has not been practic'd.
John Law – *Money and Trade Considered*

Introduction

The lives of few economists would excite the interests of a Hollywood studio, but the exploits of John Law, the 18th century monetary theorist, would certainly make a compelling movie. Any A-listed actor would relish the role of the dueller, the professional gambler, the most eminent social climber of eighteenth century French society, and the Scottish murderer who eschewed the typically dour character of his native country to rise to the apex of the government of his adopted home. It is primarily due to these exploits that Law is only perceived as a man of action, whilst his monetary theory and reasoning are considered flawed, or not considered at all.

However, important elements of Law's thought should be more reappraised along broader lines, as he did not work within the structures of any school of economic thought. Law not only recognised money as a developmental process, but also made huge efforts to advance this process. I will argue that Law, instinctively rather than formally, grasped the true concept of money, and was more in sympathy with the monetary thinking of the 1930's than the 1730's. In particular, I will argue that *The Philosophy of Money*, Georg Simmel's (1990) seminal work, makes explicit the sort of implicit reasoning upon which Law based his monetary theory and policy. I will outline Simmel's philosophy of money, and then demonstrate its striking similarities with the theoretical construct that served as the basis for Law's monetary thought and policy.

The Theory/Practice Dynamic in Money & Banking

> *If the materialistic interpretation of money now appears to be an error, historical analysis shows that this error was not accidental but was the appropriate theoretical expression of an actual sociological condition, which had first to be overcome by the real force before its theoretical counterpart will be overcome in theory* (Simmel, 1990: 174).

Throughout the history of money, banking and finance theory has tended to follow rather than lead practice. In Law's era the banking activities of Goldsmiths were ahead regulation, and this can still be seen in financial innovations today. The pace of financial innovation, driven by self-interest, or in Law's case, national interest, will always be ahead of regulation, and ahead of theory. In this sense, theory serves not as a prior rational for practice, but rather a post hoc rationalisation of practice in an effort to make sense of the forces driving practice to better understand future circumstances. "The urge to explain has to rest content with investigating these processes and treating them as (unconsciously) effective causes, although they merely symbolize the real course of events"(Simmel, 1990: 145).

Therefore, it is quite conceivable that whilst Law could 'work out the economics of his scheme with brilliance', based upon an intuitive grasp of the philosophical nature of money through considered reflection, the formal exposition of the nature of money in a theoretical context might not occur for some time afterwards. This exposition is most thoroughly outlined in Georg Simmel's (1990) work, *The Philosophy of Money*. Law's vision of what money and the banking system could become was based on ideas consistent with much later reasoning, and was also strikingly similar to the structure of the modern banking system.

This is of considerable credit to the incisiveness of his thinking. As Murphy puts it, "Law failed as a policymaker. However, he displayed great theoretical vision in his writings, a vision close to the actual structure or our modern monetary system"(Murphy, 1994: 15).

Georg Simmel's Monetary Philosophy

(A) Money Objectifies Subjectively Imposed Values

Simmel (1990) contends that in philosophical terms, the natural order is one of equality between all concrete matter, whilst values are imposed by the individual, based not merely on the economic good in question, but also the individual's subjective relation to them. Economic value arises from 'distances' to initially unattainable goods, which are overcome through exchange. Thus it is the function of money as an exchange mechanism that constitutes its value, and "If the economic value of objects is constituted by their mutual relationship of exchangeability, then money is the autonomous expression of this relationship"(Simmel, 1990: 120, also 125, 128).

Money and value are linked not directly, but indirectly through exchangeability, and as this becomes more complex, the more value can be objectified via money. (Simmel, 1990) Money as the perfect tool for exchange seems itself the embodiment of objective value, whilst it retains its subjectively imposed value origins. Values undergo a Cartesian objectification through the process of exchange, facilitated by money. "Since everybody offers for exchange what is relatively useless to him, and accepts in exchange what is relatively necessary, exchange effects a continuously growing utilisation of the values wrested from nature at any given time"(Simmel, 1990: 292). Money, by facilitating the exchange process provides a compelling impetus to economic activity.

(B) Monetary Values as Relations

Whilst money might appear directly comparable with subjective value judgements at a superficial level, this is not case.

> *The equation between the value of a commodity and the value of a definite money does not signify an equation between simple factors but a proportion, that is an equation between two factors, the denominator of which, within a given economic area, is on one side the sum total of all commodities and on the other the total amount of money* (Simmel, 1990: 136, also 120, 147).

However, individuals need not be directly aware of these implicit denominators in their calculations to behave rationally. Simmel (1990) used the example of water flowing through a pipe to explain that whilst money and value are related this does

not necessitate comparability.

(C) Money as a Process of Development

Simmel (1990) views money as a developmental process, at the end of which it becomes a pure symbol. This pure concept of money is equivalent to a Platonic ideal, and as such can only be approached incrementally, but never attained.

> *Whatever may be the historical origin of money- and this is far from being clearly established – one fact at least is certain, that money did not suddenly appear in the economy as a finished element corresponding to its pure concept. Money can have developed only out of previously existing values in such a way that the quality of money, which forms part of every exchangeable object, was realized to a great extent in one particular object; the function of money was at first still exercised, as it were, in intimate association with its previous value significance* (Simmel, 1990: 119).

Simmel (1990) cites the start of this development with Mercantilism, where money in the form of specie is fallaciously taken to directly represent value. Yet as exchange becomes more complex, the more value can be objectified via money, and the less is the need for it to be grounded in specie. He claims that this limitation on money was recognised as unnecessary in the 18th Century and that now there exists many forms of value not recognised as such before. The notion of value is extended to different ideas and implements in sequence as humanity learns to exploit them more fully, and old limits to the definition of money are rendered obsolete.

(D) Philosophical Nature of Money

> *Through all the discussions of the nature of money there runs the question as to whether money, in order to carry out its services of measurement, exchange and representation of values, is or ought to be a value itself; or whether it is enough if money is simply a token and a symbol without intrinsic value, like an accounting sum which stands for a value without being one* (Simmel: 1990: 131).

Based on Simmel's earlier reasoning the answer to this question becomes a tautology. Purely symbolic money cannot be inherently valuable; "Since it stands

between individual objects and in equal relation to each of them, it has to be completely neutral"(ibid. p123). Whilst other objects acquire their value from being both scarce *and* inherently useful, money, with only the first of these characteristics, takes on a veil of value. "Since money is nothing but the indifferent means for concrete and infinite purposes, its quantity is its only important determination as far as we are concerned. *With money, we do not ask what and how, but how much"*(Simmel, 1990: 259, emphasis added).

The Progress of John Law's Monetary Ideas

In Law's era, the idea of paper money backed by land was mostly closely associated with the work of Sir Hugh Chamberlen. Indeed, J.K. Horsefield comments, "John Law criticised Chamberlen's plan, as we have already seen, but his own ideas did not differ widely from it"and this is essentially correct. (Horsefield, 1960: 217) The *Essay on a Land Bank* merely proposes a once-off recalibration of the Scottish monetary system to a land standard, based on the supposition that this would lend it more stability than specie. Law saw that the limit to the money supply caused by metallic money was constricting the development of the Scottish economy. However one cannot doubt the significance of *Essay on a Land Bank*, as it served as a stepping stone, a necessary precursor to Laws more advanced reasoning in *Money and Trade Considered.*

Some economic historians have put the gap between the writing of the *Essay* and *Money and Trade* at as little as five years, but this period represents a theoretical quantum leap, often compared to Keynes' change in emphasis between his *Treatise on Money* and *The General Theory.* Law is now concerned with the issue of unemployment in the Scottish context, and sees a solution in his earlier investigations into the nature of money. "A limited sum (of money) can only set a number of people to work proportion'd to it, and 'tis with little success laws are made, for employing the poor or idle in countries where Money is scarce"(Law, 1966: 13).

Law formulated an early version of the circular flow of income to show how money could drive trade, based on a money in advance requirement, whereby money is a necessary pre-condition for trade and economic activity. Law recognised that money supply and economic activity should move in concert, but whilst money may race ahead of activity (as it spectacularly did in Laws scheme in France), trade cannot expand beyond money, which can act as a fetter on the economy.

"Considering the present state of Europe, France and Spain being masters of the mines. The other nations seem to be under the necessity of setting up another money. The only reason can be given why it has not yet been done, is, that the nature of money has not been rightly understood"(Law, 1966: 77).

Law, however, grasped the nature of money more keenly that his contemporaries, and realises that an intrinsically valueless money could advance the national economy. "If a money be established that has no intrinsick value, and its extrinsic value be such, as it will not be exported; nor will it be less than the Demand for it within the Country: Wealth and Power will be attained, and less precarious"(Law, 1966: 102). Relying on an optimistic view of rate of real economic adjustment to monetary changes, Law later inundated the French economy, with paper currency backed by secured loans to his gargantuan Company of the West. The initial stability of value concern of the land bank scheme is nowhere to be seen in Law's so-called 'Mississippi System', and this indicates the degree to which John Law had advanced his monetary ideas by the time he had the opportunity to implement them, in 1719, when he became Controller General of the finances of the French economy.

Similarities Between Simmel and Law

(A) Philosophical Elements of Laws Thinking

"John Law (1671-1724), I have always felt, is in a class by himself. Financial adventurers – but is it fair so to call that administrative genius – *often have a philosophico-economic system of sorts*"(Schumpeter, 1981, p294). Law was not a disciple of any economic group, and relied more on his observations of banking systems as he travelled Europe to fuel his monetary ideas. He had a remarkable intuitive grasp of these issues, although perhaps less remarkable given his background as a professional gambler, and essentially worked from first principles, building his theory essentially uninfluenced by the economic orthodoxy. (Murphy, 1997) This imparts a certain Cartesian skepticism to Laws work, whereby no pre-existing economic tenets are accepted at face value. I would thus argue that the basis of Laws monetary thought and policy had a more meditative, philosophical content than any other economic theorist up to this time.

(B) The Development of Money as a Process

The development of Law's theories of the fundamental nature of money in terms of its inherent value constitute a segment of the developmental process of money towards a purely symbolic ideal envisioned by Simmel (1990). "With the growing need for means of exchange and standards of value it (money) changes more and more from a connecting link between value equations to a symbol of these equations and thus becomes more independent of the value of its material"(Simmel, 1990: 144). Simmel recognises the need for money to escape its roots as an intrinsic value if it is to be exploited to the full extent as a tool for human advancement. Law's contemporaries, and even he himself in his earlier writings, had a conception of money firmly based on its link to intrinsic value, "...but Law later moved away from the land bank proposal to a fractional specie reserve based bank, to a bank issuing irredeemable paper currency, to a system creating both paper money and company shares which were traded like money"(Murphy, 1994: 39). Thus Law provided a significant impetus to the process of development of the monetary system.

(3) Money as a Relation

Simmel goes to some pains to explain the role of a quantity of money as the numerator of a fraction, with the total sum of money as a denominator, as the value relation to any goods or services. (Simmel, 1990) In an interesting comparison, Law gives as terse a statement of this idea as one could hope. "The proportion of value goods have to one another is known by money."(Murphy, 1994: 55) Law's analysis of the relative price changes of gold and silver also shows an incisive understanding of this numerator over denominator monetary determination of value. "Gold is not more valuable, it is less valuable, but silver has fallen more in its value than gold"(Murphy, 1994: 86). Law argues that changes in the total supply of silver (augmented by newly exploited American mines) have significantly altered the value relation between discrete quantities of gold and silver. Law's view that other proponents of the Land Bank scheme did not 'understand' the nature of money, to the extent that they may not have clearly seen this value ratio, may have been correct. Indeed, David Ricardo was still grappling with the issue of relative price changes between goods (in his case corn) and a monetary standard in his *Principles of Political Economy*.

(4) Money as a Tool

Simmel considers money to be the purest form of tool for human

utilisation, "Money is the purest reification of means, a concrete instrument which is absolutely identical with its abstract concept: it is a pure instrument."(Simmel, 1990: 211) Law also saw money in this instrumental sense, and identified two categories of money, based the extent to which different financial instruments, such as shares, could fulfil the functions of the monetary tool. Law was to utilise money as a tool to leverage growth in the French economy to an unprecedented extent, and in the process unwittingly pushed it almost to the point of collapse.

Causes and Consequences of the Failure of Law's Scheme

Over expansion of the money supply will always be a danger with paper credit schemes.

> *The specific significance of money for the pace of economic life is further substantiated by the fact that the crisis that occurs after the excessive issue of paper money retards and paralyses economic life to a corresponding degree* (Simmel, 1990: 500).

The spectacular fall of Law's Mississippi Scheme, after an equally spectacular rise, was also the result of a combination of other factors. Outside his control was the fact that,

> *It is possible to exchange the most valuable things against a printed form only when the chain of purposes is very extensive and reliable and provides us with a guarantee that what is immediately valueless will help us to acquire other values* (Simmel, 1990: 142).

Paper money will only function in an economy when the assumption that it will be accepted elsewhere is beyond doubt. Law's policies failed because he overestimated the sophistication in the French economy on this point, and also because at this time it was an extreme case, crippled by government debts. Law became more concerned with debt issue, and this was to sound the death knell to his scheme. Law tried to solve not only a monetary crisis, but also a debt crisis, with a tool (paper credit) that could deal with only the first issue, and attempted to do so in less than accommodating circumstances.

The Mississippi Scheme is an estimate of Law's self-belief at this point that he felt his scheme could provide a solution for both problems. A charitable

interpretation of this might appeal to Law's spirit of optimism, and his belief that all economic difficulties could be overcome. A cynic might wonder whether Laws ego or the French Economy had been inflated more by the success of his system up to this point. To this extent the failure of the Mississippi system was a product of Law the man, who failed to see the limitations of his vision. This is, I feel, overly unfair on Law, especially when one remembers that whilst Versailles and the opulence from the reign of Le Roi Soleil have survived, time has not been so kind to Law's ideas, which tried to wrest the French economy from the ruin that was to be the cost of this affluence.

Any cursory examination of the history of money will reveal the robustness of the development of money as a concept. It has been formulated in innumerable ways inappropriate to the modern context - the Lydians used an incredibly rare alloy of gold and silver called electrum, and the Greeks employed a form of credit secured on the debtors' personal freedom – all of which have been abandoned, but the concept of money has survived. Whilst Law's exertions may not have lead to the rejection of paper credit schemes, they did bring it into disrepute in economic circles, and in Schumpeter's (1981) view, considerably impeded progress towards the modern banking system. (Schumpeter, 1981: 283)

Conclusion

Unusually, John Law possessed both the intellect to understand the accepted parameters of the notion of money and its necessary properties for his time, but also the vision to see that these parameters were not fixed, and that the conception of money had, and would continue to change. J A Schumpeter draws an important distinction between success in theory and in practice, and whilst Law did fail as a policy-maker, this should be considered separately from his theoretical contributions, which extended far beyond those discussed in this paper. Unfortunately this has not been the case, and subsequent economic thinkers have denigrated Law's work. Even Keynes, for whom Law would have provided an obvious theoretical bloodline, failed to mention Law. It is ironic to think that Law may have been as esteemed as Keynes himself, if only he had been content to remain within the realms of theorising, as any theory that is never tested can never be rejected.

Bibliography

Chown, J. (1994) *A History of Money From AD 800.* London: Routledge.

Horsefield, J. (1960) *British Monetary Experiments (1650-1710).* London: G. Beel & Sons Ltd.

Jones, J. (1972) *The Money Story.* Devon: David & Charles Ltd.

Law J. (1966) *Money and Trade Considered with a Proposal for Supplying the Nation with Money.* New York: Kelley.

Murphy, A. "Law & Cantillon on the Circular Flow of Income."*European Journal of the History of Economic Thought.* 1.1 (1993): 47-62.

-- (1994) *John Law's Essay on a Land Bank.* Dublin: Aeon Publishing.

-- (1997) *John Law – Economic Theorist and Policy Maker.* Oxford: Clarendon Press.

Schumpeter, J. (1981) *A History of Economic Analysis.* London: Allen & Unwin.

Simmel G. (1990) *The Philosophy of Money.* London: Routledge.

Student Economic Workshops

Michael King – Workshop Coordinator

In addition to publishing the Review, *the Committee organised several workshops throughout Hilary Term. Michael King, assistant editor and in charge of the workshops, now tells us about each of this year's workshops*

This year has been the most successful year to date for the student economic workshops, with a total of 5 organised presentations. Traditionally, the aim of the workshops was to allow undergraduates or post-graduates to present their work to interested undergraduates. This year saw a departure. We embraced wider topics, designing workshops for our target audience, the students, while on the other hand remaining true to our roots. The result was over 250 economics students took time to attend our presentations.

WORKSHOP N$^{O.}$ 1

ECONOMETRICS MADE SIMPLE. *15TH JANUARY, 4.00PM*

At the ideal moment, as econometrics students despaired with project deadlines, Carol Newman calmed the nerves, with an overview of Econometrics, which illustrated its simplicity. Carol discussed the formation of the model, estimation of the parameters and interpretation with specific emphasis on practical problems of the project. Drawing from her postgraduate work Carol provided a dynamic and interesting presentation.

WORKSHOP N$^{O.}$ 2

PROSPECTUSES ON FDI & LIQUIDITY SHOCKS *30TH JANUARY, 2.00PM*

The aim of this workshop was to give students a contemporary understanding on exogenous liquidity shocks and the effects on FDI in International Financial Markets. Part-time lecturer Constantin Gurdgiev brought students through the current theories and their flaws before explaining the gap his own research was to bridge. With in depth reference from mathematical models we considered the role of the Government and ultimately the IMF in protecting firms from micro and macro liquidity shocks.

WORKSHOP N$^{O.}$ 3

THE DEVELOPING WORLD'S PROBLEMS & OUR FAILED RESPONSES

15TH FEBRUARY, 8.00PM

The SER teamed up with the St. Vincent de Paul Society in college to run a very special talk on third world development. Sincere gratitude must be given to Fiona O'Brien from the Vincent de Paul for organising the event. With Prof.

McAleese at the helm, we were guaranteed a delightful evening.

First to speak was Paddy McGuinness – Deputy Chief of Concern. Paddy took a novel approach by highlighting the connections between poverty in the developing world and here in Ireland. He emphasised that despite the great work of the UN and other agencies that slow progress was being made. He also challenged NGO's towards greater co-operation.

Our second speaker was Prof. Alan Mathews – lecturer of Economics of food markets at Trinity College. Alan started with a brief history of his work in Zambia and his motivation in dedicating his research towards this area. While acknowledging the risks he emphasised the role of incentives to make it worthwhile for farmers to change from subsistence farming. He also pointed the finger at the western world's tendency to dump agricultural surpluses on developing countries with adverse results for local prices.

Providing some on-the-ground evidence was Fiona Quinn – the donor liaison officer of Goal. Fiona described Goal's aim of self-sufficiency for their projects, as they hope to employ locals to run their projects. Fiona finished with a story of how minor macro-economic political and economic changes can have devastating effects on the streets of provincial towns in Southern Ethiopia.

Our penultimate speaker was the much-loved Prof. P. J. Drudy. Dazzling us with slides, Prof. Drudy questioned the benefit of modernising agriculture with the inevitable consequences for urban areas. Highlighting the need for a balance of policy between the need for agricultural development and maintaining agricultural employment. Internationally, Prof. Drudy told us that biased trade relationships exist with the EU as a principal culprit.

Our final speaker Andy Storey from the Irish Development Centre, Kimmage was by no means an anti-climax. In rather humorous fashion, he questioned the desirability of three trendy words in development agencies: "Empowerment, Participation and Partnership". Blind faith, he explained, in these principles masked a whole array of problems, for example participation can entrench the interests of those already in power. He stressed the need for discretion. With over one hundred in attendance, it was a memorable, informative evening's debate.

WORKSHOP N^O. 4

THE IRISH ECONOMY: CURRENT STATE AND FORECASTS

21^TH FEBRUARY, 1.00PM

A professional presentation was given to a packed Rm. 3074 by the ERSI team of Danny McCoy and Conall McCoille. The central characteristics of the Irish economy were firstly presented:

- Easing but still robust growth levels
- Inflation to moderate, while domestic pressures to mount
- Employment growth slowing as full employment is reached
- Strong public finances
- Weakening balance of payments.

Danny considered the likely effect of the US slowdown and likely appreciation of the Euro. He also told us that our economic expansion had little to do with productivity growth and more to do with labour growth and capital influxes, indicating that any further growth will have to be based on productivity increases.

More theoretically, he claimed that our economic expansion was demand driven rather than the more publicised supply factors. The effects that the US slowdown was to have on Ireland were considered. Both Danny and Conall provided us with an up to the minute briefing on the Irish economy which was warmly received by the over eighty students in attendance.

WORKSHOP N^O. 5

SCHOL CLASS 2001 ***27^TH FEBRUARY, 6.00PM***

Three Committee members, Charlie, Ronan and myself, gave a talk to students sitting the Foundation Scholarship exams. Having sat the Schol exams ourselves, we sought to calm any nerves. Charlie gave an in-depth talk on Ireland's economic history from 1660 to 1900, explaining how best to find resources. I talked to them about questions on taxation, highlighting the differences between direct and indirect, corporation and personal, progressive and regressive. Ronan, lastly, spoke of the importance of the unique General Paper exam, and how best to approach it. He also spoke of what to do in the vital days before and during the exams. Lastly, the Committee extended an invitation to all the Schol class to come to the Launch.

I would like to thank sincerely all those who helped make this year's workshop series very successful, all our speakers, the St. Vincent de Paul Society and, of course, the SER committee. I hope that we can leave behind a legacy of facilitating the promotion of the discussion of economics through the workshops, in an ambitious and extensive manner.

The Annual UCD Colours Debate

David Beamish – Debates Convener

Apart from the Review, *the Committee are also involved in organising intervarsity debates, in particular, the annual Colours Debate between the Economics Departments of UCD and Trinity College. David Beamish, the Debates Convener, now discusses this year's event.*

The annual colours debate between Trinity College and UCD took place in Belfield. The motion was 'That this house believes that Charlie McCreevy should not yield to the European Council.' Trinity College proposed the motion and being the visiting team opened the debate.

Seeking to avenge last year's defeat, Trinity College put forward a strong team consisting of Jim McElroy, John Lyndam – both accomplished Phil/Hist speakers and Eoin O'Hógáin – a scholar. The UCD team consisted of two of their previous years team, Declan Murphy and Simon Laraghi and new recruit Kevin Ryan. The five judges were: Prof. Antoin Murphy, Prof. Brendan Walsh, Val Kevney, Dermot Heuston and Trisha Circit.

While the debate took place in UCD, Trinity supporters represented the majority of the crowd and were often vocal in their support of references to 'Belfield Polytechnic' used repeatedly throughout the night!

Eoin opened proceedings and aimed to show that Ireland's reprimand was both unfair and contradictory and had overshot the terms laid down by the Maastricht Treaty. Further, he added that the primary cause of inflation in Ireland was caused by the weakness of the Euro.

Kevin, UCD, responded by saying that Ireland, while small and perhaps insignificant in Europe, could be setting a dangerous precedent which others may follow to the detriment of the Union. Further, he drew on Game Theory suggesting that acting in one's own self-interest will not provide the optimal solution.

John Lynham was keen to point out the political consequences of the Council's actions and the fact that the Irish public would lose confidence in Europe and further integration, if the Council insisted on behaving beyond the conditions of the Treaty. Further, he also drew on the innate fear that small countries have, that of there being 'rules for the big and rules for the small.'

Declan, UCD, tried to argue that McCreevy's budget actions have been procyclical and reckless and only fuelling inflation by encouraging 'too much money to chase the same amount of goods'. However, Jim McElroy was quick to point out that Irish GDP had been rising continually for 10 years and the range of goods available to the consumer had increased.

Jim concluded for Trinity College by summing up and arguing on five main points – that the guidelines as set out in the Maastricht Treaty are weak and contradictory, Ireland's inflation is imported, Ireland is an extremely successful economy, that social welfare agreements have been one of the blocks, upon which the economy's success has been built and thus must be maintained, and finally that the Council cannot act beyond the powers decreed upon it in the Maastricht Treaty if the Council wishes the public to have faith in it.

Simon Laragi concluded for UCD by again emphasising the dangers of procyclical budgets introduced by McCreevy and that Ireland signed up and agreed to follow the 'broad economic guidelines'.

The judges retired outside to consider their verdict and questions were put to the floor. The final verdict was a win for Trinity College, with best speaker going to Simon Laragi. On an editorial note, I would like congratulate the team for a commanding victory and to thank Colin Andrews who prepared the team for the debate.

The Problem of Irrational Bubbles in Financial Markets

Aleksandar Zaklan – Socrates

Much writing on the stock markets is based on the efficient market hypothesis, which assumes that all actors act rationally. Aleksander Zaklan challenges this hypothesis, using recent examples to prove his case. He decides that the USA's stock markets show characteristics of a bubble. He then goes on to analyse how the Fed could intervene to lessen the effects of a bursting bubble. He concludes that the best method of intervention is not entirely clear.

Americans are apt to be unduly interested in discovering what average opinion believes average opinion to be; and this national weakness finds its nemesis in the stock market. J.M. Keynes – *The General Theory*: 159

Introduction

Financial markets are at the very centre of the Anglo-Saxon economic world. They are supposed to allocate capital where it can be employed most usefully, being an impartial judge of the value of investments performed through it. Therefore, they are to be let their free will, as they will care for valuations equal to the assets' fundamentals. They will do so through the rational nature of its participants that earn profits by keeping the assets at their fundamental values or bringing them back there, thereby crowding out participants acting contrarily to this. This assumption has led to the Efficient Markets Hypothesis, stating that all available information is contained in the assets' prices.

Recent literature, however, challenges this view, suggesting that departures from fundamentals, called bubbles, are possible and eventually result in a collapse of asset prices that can spill over into the real economy and cause a severe recession. I shall attempt to find out about the possibility of the occurrence of financial bubbles, describe their manifestation and find reasons for their development.

If one accepts the possibility of such a bubble, the question should be posed whether it is possible for the central bank, as the anchor institution, in any one economy to take measures against it, since in that case the market would not be able to do so. I shall examine this problem in the context of the American stock markets during the 1990s and therefore the possible role of the Federal Reserve System. I chose the American stock markets because of their size and influence on the rest of the world's financial system. Also, there has been enormous growth in its assets' value over the past decade.

More specifically, this paper is organised as follows: a literature review on financial bubbles, empirical evidence on historical bubble developments and the situation in US stock markets during the 1990s, a review of the central bank's scope of action and an application of this scope to the specific situation in the US during the past decade. A conclusion follows.

ARE BUBBLES POSSIBLE?

Arguments against

The most prominent propagator of financial market efficiency is Milton Friedman.[1] He admits that some market participants might invest too heavily in certain assets so that these depart from their fundamental values. However, these always have rational investors betting against them, knowing that the asset prices are not justified. These rational agents make profits by returning asset prices to their fundamentals, thereby making irrational traders lose money and eventually forcing them out of the market. According to this, speculative bubbles are not possible, as any such movements are corrected immediately. From this line of argument follows the Efficient Markets Hypothesis, stating that the current price of assets represents all available information concerning them.

Another explanation for a supposed non-existence of financial bubbles is by Garber (2000). He sees a bubble as the manifestation of irrationality. He states that if financial behaviour results in a pricing of assets that only ex post turns out to have been too high, but at the time of pricing could have been expected to be true, it was not irrational. Therefore, a bubble is *per definitionem* excluded. To me, this is like describing a simple economic model, excluding certain important factors by definition and then claiming that because they have been excluded in the model they do not exist in reality.

Arguments for

There is a bulk of literature challenging the view that markets are rational. Different factors are being identified that may exert influence towards a deviation from asset pricing according to fundamentals and thus induce the development of a bubble. One approach concentrates on the characteristics of human nature itself.

[1] ...in his 1953 paper "The Case for Flexible Exchange Rates"

Keynes (1936) is taking this stance. For him, there is a tendency to move in a crowd, leading to short-sightedness, overreaction to news and distorted estimation of risk. This led him to conclude:

> *The actual, private object of the most skilled investment [...] is to outwit the crowd, and to pass the bad, or depreciating, half-crown to the other fellow. [...] We [...] devote our intelligences [sic] to anticipating what average opinion expects the average opinion to be* (Keynes, 1936: 155-156).

Shiller (1998) gets more specific, referring to certain psychological and sociological concepts describing human behaviour to explain inefficiencies in financial systems.

Prospect theory suggests that people exaggerate or underestimate probabilities for the occurrence of certain effects, leading to departure from rational expectations towards more non-linear types of behaviour. The concepts of regret and cognitive dissonance lead to incorrect market timing, inducing individuals to sell at only moderate gains in order to avoid errors and to keep depreciating stocks in order not to finalise an error previously made. Overconfidence leads to excessive extrapolating of trends and gambling behaviour. A famous example of gambling behaviour is that of Sir Isaac Newton, who during the South Sea Bubble first made a profit of 7,000 Pounds, then bought in again and lost 20,000 Pounds (Kindleberger, 1989). The phenomenon of anchoring states that market participants have different price backgrounds at the beginning of their market involvement to which they intuitively refer when making decisions about investments, thus having different perceptions of fair asset valuations. The disjunction effect describes the habit of waiting for information, even if it is completely irrelevant to the individual investment decision. This could explain low trading volumes and low market volatility before press announcements and high values in both categories afterwards. This pattern does not only manifest itself in the case of shares for which meaningful information can actually be expected, which would be understandable, but is evident across the market (Shiller, 1998).

According to Sachs (1998), beliefs can lead to self-fulfilling prophecies, resulting in mass dynamics, causing either boom or bust. An example for this would be the common belief that the US economy will have a soft landing. If most of the market participants think so, they will keep their volume of investment steady. This in turn might lead to a stabilising of the economy, which quite strongly depends on

the state of its financial markets.

Shiller (1999) questioned institutional investors and individual investors and constructed indices of their bubble expectations. The expectation indices exposed many short-term oscillations. This seems to confirm the observation of overreaction to market news and anchoring (Shiller, 1998). Other authors concentrate on informational imperfections. Shiller (1995) states that limitations of time and natural intelligence make individuals follow the behaviour of a group of leaders. From this, a herd externality can be inflicted upon markets.

This herd behaviour is modelled explicitly by Banerjee (1992). In his model individuals ignore own information, relying upon signals received through the behaviour of others that have moved earlier. As a result of this behaviour the stream of information is narrowed and individuals start moving as a herd. To me, the model, even if somewhat artificial and constrained in its set-up, is a plausible explanation for the possibility of a bubble development.

Today, many investors rely on certain media for information, instead of conducting original research. Garber (2000) even sees it as a sign of rationality. However, the main market participants' technically sophisticated asset valuation models are based on certain assumptions and may lead to a false sense of accuracy, being potentially wrong in predicting asset price evolution and additionally preventing the users from consulting other sources of information ("Turbulence..., ???")[2]. Even a crisis with relatively light consequences for lending financial institutions, such as the Russian debt default in 1998, can have severe consequences through the simultaneous use of the same risk management techniques by financially potent actors like banks. These risk management techniques may suggest the same actions that can result in a market breakdown, if sufficient financial power is involved.

Some authors suggest the possibility of a rational bubble, in which higher returns can be achieved due to the higher risk that the bubble might burst. Even rational investors might get locked into such a situation, as they would lose money if they were to just stand aside and watch the development (West, 1988, Frankel & Froot, 1990). The key issue in most of the modern research is the role of so called noise traders that do not act according to fundamental predictions of values, but try

[2] Unfortunately I have to refer to this article in this imprecise manner, as neither the author nor the year of publication was evident from it.

to "outwit the crowd", thereby amplifying the crowd's movements and taking the trade away from the fundamentals.

This stream of research raises a number of issues surrounding the supposed controlling of noise traders through rational speculators who supposedly bet against them and thus bring asset prices to fundamentally justified levels. Cutler *et al.* (1991) see price movements as a result of the speculative process itself, with changing noise trader sentiment being better able to explain variations in asset returns than changing risk factors.

De Long *et al.* (1990a)[3] developed a model showing that noise traders increase the systemic market risk through exaggerating price movements. Rational investors cannot control them adequately because of this increase in systemic risk and due to the fact that their time horizons are limited. The impact of noise traders is even greater if a group of passive traders is included. To me this model seems reasonably realistic, if you picture noise traders as being large, highly leveraged mutual funds and passive investors being individual long-term investors or holders of passive index funds.

De Long *et al.* (1990b)[4] use the model of De Long *et al.* (1990a) and set out to explain the recurring development of feedback bubbles over time. They state that noise traders tend to chase the trend by extrapolating price changes instead of price levels, a development that is not sustainable over time. For example, it should be fairly impossible for an industry to grow at an annual rate of more than 50% for much longer after its infancy, such as seen with US dotcom companies. This statement seems to fit with Shiller's (1998) observation of overconfidence in investors. According to De Long *et al.* (1990b), rational investors seem to trigger actions by noise traders, which lead to a destabilisation of prices.

Overall, a common pattern in the development of a feedback bubble seems to be observable. Firstly, there is an accumulation phase with rational investors, so

[3] Please note that I named the articles by De Long *et al.* 1990a and 1990b, without themselves being marked in this way. 1990a refers to: J. Bradford De Long, A. Schleifer, L.H. Summers, R.J. Waldmann. "Noise Trader Risk in Financial Markets." *Journal of Political Economy.* 98.4 (1990).

[4] See J. Bradford De Long, A. Schleifer, L.H.Summers, & R.J. Waldmann. "Positive Feedback Investment Strategies and Destabilizing Rational Speculation." *Journal of Finance.* 45.2 (1990).

called smart money, buying into assets. Then noise traders appear on the scene, leading to a wider distribution of assets and inflation of asset prices. The third and last step is a liquidation of the assets in which smart money makes profits and uninformed noise traders mostly lose out. This process repeats itself over time. New bubble situations seem to differ from previous ones, as the development can span several years and therefore is not immediately recognisable as a bubble. This may be due to noise traders' limited horizons and their failure to learn from past actions (Shiller, 1998).

Overall, the approaches of De Long *et al.* (1990a) and De Long *et al.* (1990b) could be united towards the conclusion that rational investors could be steering the development of bubbles, resulting in a redistribution of capital from "stupid" to "smart money" via the bubble mechanism. Kindleberger (1989) also follows this approach, stating that through this mechanism professional insiders part outsider amateurs from their money.

Mishkin (1991) presents an asymmetrical information approach to explaining the emergence of financial crises. According to him, there is a common pattern in most of the crises he analyses, for which he proposes the following transmission mechanism. Falling prices in corporate equities increase the danger of moral hazard, as then poorer entrepreneurs have less to lose by engaging in fraud. Therefore uncertainty in principal-agent relationships rises, expressing itself in an increase in the spread between interest rates on high quality corporate bonds as opposed to low quality ones. Finally, banks restrict their lending by raising the interest rate. This broader approach complements Friedman & Schwartz's (1963) notion that a contraction in the money supply best explains financial crises. Mishkin's (1991) approach illustrates the possible spill-over process from the bursting of a financial bubble towards a recession of the real economy.

The material examined so far clearly suggests to me that financial bubbles can indeed exist. Also, in my opinion some of the above-presented approaches to explaining bubbles can be applied to the situation in the US during the 1990s. Now I shall proceed to back this intuition up with empirical evidence.

Evidence on bubble developments

According to Frankel & Froot (1990), the ratio of noise traders to rational investors is an important indicator of the overall extent of speculation in a market and thus the possibility of a bubble development. In their discussion they try to

explain the huge appreciation of the US Dollar in 1984 and 1985. They suggest that this appreciation might have been influenced through noise trading and that for this reason the US Dollar overshot its equilibrium exchange rate. They find that this development might have been influenced through a switch from forecasting based on fundamentals to technical analysis by most financial institutions, which account for about 95% of the total trading activity in the currency market. In 1978, from twenty three analysed forecasting services in total only 3 institutions conducted technical analysis and nineteen preferred forecasting based on fundamentals. In 1988, however, from thirty-three in total, eighteen used chartist techniques and only seven stuck to fundamental analysis, while six used both approaches. The overvaluation of the Dollar compared to the Euro in 2000 might be explained by the same factors.

This conclusion seems to be consistent with the observation of excessive extrapolating of trends by speculators that might lead to a bubble situation (De Long *et al.* (1990a); De Long & Schleifer, 1991; Shiller, 1998). Friedman & Schwartz's (1963) analysis concludes that real recessions are caused by a contraction in the money supply. This leads me to the conclusion that this contraction may well have been caused by the collapse of a previously emerged financial bubble, through which the money supply might have been over-expanded.

Mishkin (1991) analyses several financial crises in the US spanning the period from 1857 to 1987. In almost all of them there was a common constellation of falling asset prices, rising interest rate spreads and rising interest rates at the onset of a recession in the real economy. Like in the case of Friedman & Schwartz, I interpret Mishkin's (1991) results as evidence of a bubble that has burst shortly before and is then spilling over into the real economy. If the asset market was in a sound state, why should the problems described by Mishkin (1991) have happened in the first place?

At the moment, in the US the stock market prices have fallen considerably, marking a possible emergence of the asymmetric information problem described by Mishkin (1991).[5] Interest rate spreads have risen to their highest level since the 1991 recession. The main difference between the situation described by Mishkin (1991) and today's situation in the US would be that in the US is not in a recession. The situation's peculiarity seems to be clear to the monetary authorities, judging from the swift and surprising interest rate cut by the Fed on January 3, 2001.

[5] See the *Financial Times* from January 6th, 2001

De Long & Schleifer (1991) analyse the stock market development in 1929 from the perspective of closed-end mutual funds. They state that the S&P index was overvalued by at least 30%. They find that although at the height of the stock market boom the fundamentals justified high values, the asset prices could not be explained by valuation models used at that time. Mutual funds were sold at a premium. More importantly, funds were pyramided on top of each other with new funds holding shares of previously launched ones as assets in order to "part fools from their money". De Long & Schleifer (1991) also find that the number of funds being launched was especially high when noise traders were very bullish, suggesting that rational agents profited from the speculators' excessive optimism.

They conclude that the market was determined by irrationality, with rational investors being unable to correct the development due to their short time horizons and uncertainty resulting from this. Together with economic vulnerability arising from the disproportionate importance of equity financing for investment purposes and the Federal Reserve's uncertainty about how to conduct monetary policy, this bubble laid the foundation to the world's worst economic contraction in modern times. For the following conclusions, I shall assume that De Long & Schleifer's (1991) observations can be applied to the whole stock market, not only to mutual funds, such as suggested by Shiller (1999).

During the 1990s, many companies used the stock market as a source of finance. Also, many funds were launched, suggesting a higher economic vulnerability through too much reliance on equity financing. These offerings coincided with a high degree of investor bullishness, which might point towards excessive optimism. The rise of the NASDAQ and the launch of the "Neuer Markt" in Frankfurt are impressive examples of the boom in Initial Public Offerings. So far, the parallels between the past decade and the late 1920s seem to be only too apparent. From this, I am inclined to conclude that a bubble has developed in the US stock markets during the 1990s.

Kähkönen (1995) presents evidence that the boom in the Japanese stock market from 1985 to 1990 had characteristics of a financial bubble. He states that fundamentals like the interest rate and the country's historical growth trend did not predict the dramatic rise in asset prices. He suggests that expectations might have been affected through the sharp rise in companies' profits during the period, although part of this rise was cyclical. This cyclical component should not have affected investors if they were entirely rational, but should have been taken into

account in their valuation models.

In my opinion, this point can be readily made about the US during the 1990s. There seems to be a parallel development concerning the stock market whose valuation seems to be increasingly unsustainable. The boom was largely driven by newly created Internet and technology companies or traditional companies that profited from the informational revolution that boosted their productivity. The potential for further increases of this extent seems unlikely.

Kähkönen (1995) also observed a wealth effect that increased Japanese household expenditure, although it was mostly explained through the dramatic rise in land prices, as the Japanese private households did not on average hold large quantities of equity. This wealth effect could have induced the households to spend more than they could sustain in case of asset price depreciation; therefore, it increased the economy-wide vulnerability through increasing the dependence of consumption on a functioning credit market. Private consumption was hit hard through the deterioration of land prices when the bubble burst and companies found themselves not being able to borrow cheaply any more, as the value of their main collateral was hugely diminished.

In case of the US, a stock-market-induced wealth effect is clearly observable, with households actually having a negative savings rate and basing consumption on credit, relying on ever-rising share prices. To me, this is clearly a sign of a bubble development.

In Japan, after the decline in asset prices in 1990, a high degree of leverage became apparent through the collapse of the asset side of many companies' balance sheets (Haffmaister & Schinasi, 1995). "Turbulence..." points out the vulnerability of the US credit market due to its long expansion during the 1990s, which resulted in an underpricing of risk and made the credit market more unsound. In case of a crisis, this situation, being the decisive factor (Friedman & Schwartz, 1963), might lead to a collapse in the money supply leading to a real recession. In 1998, only through the Fed's swift reaction to the crisis following the Russian debt default, lowering the interest rate and thus ensuring liquidity, was a slump in the money supply averted.

"Turbulence..." found that there was a considerable degree of leverage inherent in the portfolios of globally operating financial institutions that even a minor crisis like the one of 1998 nearly made whole system break down. According to "Turbulence...", it was largely unknown to market surveillance institutions and

regulating bodies that such a degree of leverage was reached and only became visible through the crisis. This observation corresponds with Haffmaister & Schinasi's (1995) observations for Japan, saying that a bubble might be relatively difficult to detect in today's complex financial world before it has reached a very late stage.

Let me conclude that there has indeed been a bubble development in the US stock markets during the last decade. I shall now examine whether the US Federal Reserve System, hereafter The Fed, in its roles as the supervisor of the banking system and the conductor of monetary policy, can control this bubble development.

The Central Bank's scope of Action

Preventive Measures

A sound banking system is widely held to be an important basis for stable economic development. Mishkin (1991) sees banks in the role of financial intermediators in business investments, solving agency problems through financial and informational power. However, banks can only fulfil this role, when they are standing on a firm basis and are not distracted by the struggle not to fail because they undertook too many risky investments themselves. The Fed, therefore, can and should impose (together with other regulating bodies) adequate reserve requirements and take care that banks are fulfilling them.

The current requirements[6] are to hold a reserve of at least 8% of the bank's risk-weighted loans to the non-bank private sector, while for loans to non-OECD countries less is required to be held in reserve. Loans to OECD countries that are assumed to be risk-free, no reserves are required. With the sophisticated opportunities that financial markets offer, the banks can easily circumvent these requirements and expose themselves to more risk without having to keep adequate reserves.[7] Thus, incentives are perverted, encouraging excessive risk-taking, which can harm the real economy, as bad loans turn sour, especially when the economy

[6] These requirements have been implemented by the G10 in 1988

[7] For example, a loan to a county like Russia, which currently muses on a renewed debt default, is per definitionem less risky than a loan to a company like IBM. Also, lending to nearly top credit-rated companies require the same amount of reserves as very low rated firms.

shows signs of a downturn, as it does at the moment. Thus, the banking system can get caught in a bubble development and be the first and most important cause of a severe economic contraction, such as described by Friedman & Schwartz (1963), Kindleberger (1989) and Mishkin (1991).

The Basle Committee on Banking Supervision in its report from January 16 suggests that banking regulation should be made much more sophisticated.[8] It recommends that a minimum capital reserve should be ensured through either more sophisticated external risk measurement rules or internal risk assessment by banks, since it should be prudent for the banks themselves to ensure a proper risk management. The incentive to succeed in this is high, namely qualifying for reduced capital requirements. Secondly, disclosure is to be enhanced, especially necessary for the internal risk assessment to work properly. Also, it provides the central bank with wider foundations of knowledge on which to base its assessment of the degree of leverage inherent in the financial system. This is important to make crisis situations easier to forecast and avoid surprises like during the Russian debt default in 1998 ("Turbulence..."). Thirdly, banking supervision is to be strengthened to ensure that the individual banks are playing by the rules.

To implement and guard these rules is a very important task and should be pursued thoroughly by the Fed. In my opinion, this would be a very good approach to making the banking system, and through the various stages of the transmission mechanism the economy as a whole, more immune to financial bubbles.

Apart from banking supervision, the Fed can use monetary policy to ensure economic stability. Alexander (1996) observed that volatility in financial markets is affected by the monetary policy regime and depends on the credibility of the central bank. As for credibility, the Fed's chairman Alan Greenspan has built it through years of skilful steering of America's monetary policy. It is problematic to steer the real economy, which is its primary target, and the financial markets successfully at the same time, as financial markets are much more subject to other influences, such as stated above. A steady and reliable monetary policy does therefore not seem to suffice to ensure a stable development of the stock markets. Even under Mr. Greenspan's leadership, the Fed was not able to prevent the development of the bubble during the last decade. To me, tight banking supervision to avoid excessive risk-taking seems to be more promising as a preventive measure.

[8] See *The Economist*, Vol. 358, No. 8205, January 20th –26th

Interventionist measures

If there is a sign that individual banks do not comply with the laws, their banking licence can be withdrawn, as might happen in the case of Credit Lyonnais.[9] Breaching of reserve requirements can also be penalised. At least this will be more likely when the new rules resulting from the Basle committee report are implemented in 2004. These individual interventionist actions follow largely from the Fed's supervisory duties. However, when a bubble has already developed, especially when it is about to burst or even has evolved into a full-blown crisis, these measures are more than unlikely to halt the panic, rather they would magnify it.

When the bubble has evolved, the central bank can try to deflate it by seeking to influence market sentiment and make the market participants aware of the danger of the situation. Mr. Greenspan's famous 1996 remark about the markets' "irrational exuberance" can be put into this category. This approach must be handled with extreme care in order to avoid panic and in the "irrational exuberance" case it has proved to be futile, as the upward trend in the markets went on for another half decade.

The standard method of steering the market development is through monetary policy measures. Changes in the interest rate affect the market interest rate and thereby the discount component of share valuation models. The problem about this technique has already been described in the above section. The effect of interest rate changes on the real economy becomes apparent with a considerable time lag of about one year. Stock markets, however, react very sensitively, especially when the change comes as a surprise, as can be seen from the Fed's rate cut on January 3, 2001, when the NASDAQ rose by 14 % in one day.

It is very hard to decide when the central bank should intervene by rising or lowering the interest rate in a stock market boom. Goodhart's law applies here, acknowledging the impossibility of finding a factor that still predicts an outcome correctly when statistical pressure is put on those aggregates. Even if the right moment for such an intervention was known, it might be a very unpopular move that could cause the panic it should help to avoid. Apart from setting the interest rate, the

[9] See *The Economist*, Vol. 358, No. 8204, January 13th – 19th-, regarding the duties of the Federal Reserve Bank of New York in the case of a proof of breaching the law by Credit Lyonnais

central bank can also direct the money supply through its monopoly on the creation of money. This instrument also functions with a delay. Economic conditions can change too rapidly as to use it to respond to current trends in this way.

The monetary instruments cannot be used without constraint or risk. They may be constrained by factors such as high government debt and currency exchange rates (Alexander, 1996). Another important factor is the wealth effect the rising share prices had for American consumers. With the savings rate remaining on a negative level and the private indebtedness therefore rising, the Fed cannot afford to let the market become too bearish without risking a fall in demand and a resulting recession that might set off a vicious circle.

These are just few examples to illustrate that the Fed is moving in a highly complex environment, which is currently characterised by extreme tension produced by a slowing economy, a still overvalued stock market and political uncertainty after the Presidential election. Such a situation may lead to a financial crisis that makes the bubble burst; then the market is in need of liquidity that is drying up as panic makes investors rush out of assets into money. This situation requires a lender of last resort in order to reverse the trend and prevent the banking system from collapsing, such as advocated by most writers on the topic. A credible central bank like the US Fed acting as lender of last resort can restore confidence and prevent a more severe crisis, such as seen in 1987.

The problem the central bank faces in this role is a problem of timing and the amount of liquidity it should pour into the financial system, with the timing being the especially tricky matter (Kindleberger, 1989). The question may be posed as to why a central bank should act as a lender of last resort in the first place, as it weakens the market mechanism punishing investors that have proved to be too prone to risk. In other words:

> *The ultimate result of shielding man from the effects of folly is to people the world with fools.* (Spencer, in Kindleberger, 1989: 179)

Kindleberger (1989) and others state that the central bank should play this role nevertheless, as to protect sound investments from being destroyed through the panic triggered by some that may "deserve" to fail. The Fed should take care that a possible financial crisis does not spill over into the real economy and if it does, it should act towards making the recession as short as possible.

I would partly agree with Mr Spencer, being convinced that investors should have to learn from their mistakes and not blindly rely on someone to help them out of the misery they might have brought themselves into. The Fed should provide the public good of the lender of last resort in well-measured doses. This would minimise the resulting free-rider problem of reckless investors relying on the central bank to help them without having complied with its standards previously.

Conclusion

To once more refer to the question posed at the beginning of this paper. Do American stock markets show characteristics of a financial bubble? Firstly, we had to answer the question if something like a bubble might exist at all, given the statement that markets are self-adjusting as to always reflect the assets' fundamentals. The answer to this question has been yes.

Then, the more specific situation could be tackled. Above, I had to answer this question with a clear yes as well. This yes has led to the disturbing notion that the financial markets might be inherently unstable, as suggested by Kindleberger (1989).

A positive answer to the following question about the potential of the central bank to control this instability was strongly desired. The answer to this question is not a clear yes. It can be said that the central bank can exert a fair amount of influence to stabilise the financial system. It can do so via banking supervision and monetary policy.

The Central Bank cannot fulfil this task without the assistance of prudent investors who ensure that their investments remain sound. If things get bad, the central bank can and should do a great deal to restore the investors' confidence and prevent that things get worse than they have to, but investors also have to go through a learning process and guard themselves against excessive greed.

Bibliography

Alexander, V. (1996) "Geldpolitik und Volatilitäten auf Finanzmärkten." discussion paper.

Banerjee, A.V. "A Simple Model of Herd Behavior," *Quarterly Journal of Economics*. 107.3 (1992).

Bradford De Long, J. & A. Schleifer. "The Stock Market Bubble of 1929: Evidence from Closed-end Mutual Funds." *Journal of Economic History*. 51.3 (1991).

--. "The Stock Market Bubble of 1929: Evidence from Closed-end Mutual Funds." *Journal of Political Economy*. 98.4 (1990).

Bradford De Long, J., A. Schleifer, L.H.Summers, R.J. Waldmann. "Positive Feedback Investment Strategies and Destabilizing Rational Speculation." *Journal of Finance*. 45.2 (1990).

Cutler, D.M., J.M. Poterba, & L.H. Summers. "Speculative Dynamics." *Review of Economic Studies*. 58 (1991).

Frankel, J.A. & K.A. Froot. (1990) "The Rationality of the Foreign Exchange Rate: Chartists, Fundamentalists, and Trading in the Foreign Exchange Market." discussion paper.

Friedman, M. & A.J. Schwartz. (1963) *A Monetary History of the United States, 1860-1963*. Princeton: Princeton University Press.

Garber, P.M. (2000) *Famous First Bubbles*. London: MIT Press.

Haffmaister A.W. & G.J. Schinasi. (1995) "Asset Prices, Financial Liberalization, and Inflation in Japan." *IMF World Economic Outlook*. Washington, D.C. IMF.

Keynes, J.M.. (1936) *The General Theory of Employment Interest and Money*. London: McMillan.

Kähkönen, J. (1995) "Movements in Asset Prices Since the Mid-1980s." *IMF World Economic Outlook*. Washington, D.C.: IMF.

Kindleberger, C.P. (1989) *Manias, Panics and Crashes, a History of Financial Crises*. London: Macmillan.

Mishkin, F.S. (1991) "Asymmetric Information and Financial Crises: A Historical Perspective", *Financial Markets and Financial Crises*. Ed. R.G. Hubbard. Chicago: Chicago University Press.

Sachs, J. (1998) "Creditor Panics: Causes and Remedies." discussion paper.

Shiller, R.J. (1995) "Rhetoric and Economic Behavior: Conversation, Information and Herd Behavior." discussion paper.

--. (1998) "Human Behavior and the Efficiency of the Financial System." *Handbook of Macroeconomics*. Ed. J.B. Taylor & M. Woodford.

--. (1999) "Measuring Bubble Expectations and Investor Confidence." discussion paper.

The Economist. 358.8204 (January 13th – 19th).

The Economist. 358.8205 (January 20th –26th).

"III Turbulence in Mature Financial Markets." author and publishing date unknown.

West, K.D. "Bubbles, Fads and Stock Price Volatility Tests: A Partial Evaluation." *Journal of Finance*. 43.3 (1988).

The Application of Sutton's Theory to the Pharmaceutical Industry

Cliodhna Barlow- Senior Sophister

Sutton's Theory separates manufacturing industries into those with horizontally and vertically differentiated products. The escalation parameter, α, further divides the latter, based on the effects of a firm's spending on its market share. Cliodhna Barlow analyses the pharmaceutical industry within this framework, using figures for R&D, advertising and concentration. She concludes that the industry is a Type 2 low-alpha industry.

Introduction

The roots of the modern pharmaceutical industry can be traced back to the development of orthodox methods of drug research shortly after the Second World War. Since then, many changes have occurred within the industry. Government regulations, opening up of markets (e.g. The Single European Market), increases in the costs of drug research, new methods of drug development, and expansion of 'me-too' products, among others, have taken their toll on the industry's market structure.

In this essay, I will apply Sutton's theory to the pharmaceutical industry and attempt to determine whether there is a relationship between market size and market structure as he suggests. The pharmaceutical industry is a research and development (R&D) intensive industry and I will explore the effect of this characteristic on competition and concentration levels. Finally, I will examine the impact of globalisation and the increasing cost of innovation, which have been brought to light with the evolution of the industry.

Sutton's Theory

According to Sutton (1991) manufacturing industries can be divided into two types, which Schmalensee (1992) later labelled as Type 1 and Type 2. A Type 1 industry is characterised by homogenous and horizontally differentiated products. On the other hand, a Type 2 industry is characterised by vertically differentiated products. In Type 1 industries, given free entry, the basic intuition is that as market size increases, profits increase and there will be an incentive for more firms to enter the market until the profits of the last entrant just cover the exogenous overhead costs paid on entry. This would indicate a rise in the number of firms and reduced concentration.

Firms in Type 2 industries compete not only in price and horizontal product differentiation, but also in their advertising and/or R&D expenditure. Generally, advertising and R&D expenditure are a choice variable decided by the individual firm, and it is this choice that underlines the fundamental difference between Type 1 and Type 2 industries (Matraves, 1999). An increase in market size within a Type 2 industry may encourage firms to increase their expenditure in advertising and/or R&D in order to differentiate their products and typically increase the consumers' willingness to pay, thus increasing their market share. Therefore, as market size expands there is an incentive for firms to gain market share via advertising and/or R&D expenditure, which ultimately raises overhead costs. Sutton refers to this as the 'escalation mechanism', whereby fixed costs per firm are raised, which can possibly have a consolidating impact upon market structure. Undoubtedly, market structure will be less fragmented than in Type 1 industries.

Sutton (1998) further investigates the relationship between R&D intensity and market structure in Type 2 industries in order to derive why some R&D intensive industries remain unconcentrated e.g. the pharmaceutical industry. He attempts to determine the extent to which a fragmented industry, in which all firms have a small market share (and so can only finance relatively low R&D investment), can be destabilised by a firm that outspends its many small rivals. He introduces a ratio a/K, where K is the amount outspent by the firm and a is the direct change in market share caused by K. This ratio, which Sutton refers to as the 'escalation parameter' is denoted by α ("alpha"), and plays a fundamental role in Sutton's theory. It indicates the extent to which a fragmented industry can be destabilised by an outspending firm (entrant or otherwise).

It is difficult to measure the value of alpha directly, so information is extracted from observable industry characteristics. In an industry, a firm decides to follow a number of "technological trajectories", that is develop progressive technological paths that lead to the development of different groups of products. A firm can choose to follow one particular trajectory, and focus all its spending on it, or to spread its spending across several. Focusing on a single trajectory is associated with the standard 'escalation mechanism', as previously mentioned, and such an industry is labelled 'Type 2 high-α'. It is termed a high-α industry, because if all firms within that industry are concentrating on a single trajectory, a deviant firm that outspends its rivals in R&D can destabilise the market. Where firms developing many trajectories are associated with the 'proliferation' of various distinct technologies, such an industry is labelled 'Type 2 low-α'. This industry is termed

low-α because a deviant firm that outspends its rivals in one area will not destabilise the market, as the rival firms are following many different trajectories which they can fall back on (assuming linkages between product groups are weak i.e. minimum transfer of knowledge from one product group to another).

If a deviant firm increases its market share as a direct result of its R&D spending decisions, it can disrupt the industry structure. In a Type 2 high-α industry, the deviant firm can capture some market share, regardless of how many other firms are in the industry. As a result, this type of industry will be associated with high R&D spending and high concentration. On the other hand, in a Type 2 low-α industry, the deviant firm may be able to capture some sales along a particular trajectory, however, it may not be able to capture a significant market share. This industry will be characterised by high R&D spending and lower concentration. Matraves (1999) adds that in Type 2 low-α industries, the escalation of R&D causing a shakeout of technologies over time will not be observed, but rather a proliferation of technologies, where new ones enter and exist alongside the old. In this way, concentration levels may remain low indefinitely.

The Pharmaceutical Industry: Applying the Theory

Sutton (1998) argues that R&D technology in pharmaceuticals is that of a low-alpha industry. Is there evidence to support this? I will now examine whether the industry is characterised by high R&D and advertising expenditure, and lower concentration levels as the theory suggests.

R&D Expenditure

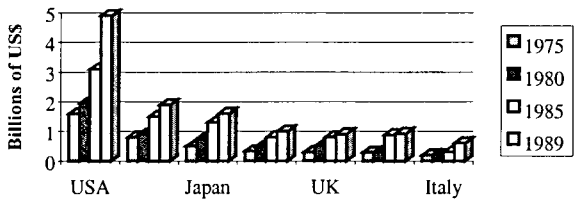
When R&D is expressed as a share of total revenue, the pharmaceutical industry has emerged as one of the largest spenders in the manufacturing sector, ranking alongside electrical equipment and electronics, aerospace, and chemicals (Ballance, 1992). Furthermore, this expenditure has been rising steadily. American companies, for example, were devoting roughly a fifth of all their revenues to research in 1989, up 15% per cent since 1975. This pattern can be similarly seen in the United Kingdom, where research expenditures were 5.7 per cent of gross output in 1970, but had risen to 13.3 per cent by 1988, and estimates for other European countries are even higher (Scrip 1433). Sums such as these are large in comparison to the industry's turnover, but because public funding is not considered, they understate the total amount spent on research.

The radical change in the methodology of drug discovery has had an impact on the costs of research. In the past, technologies by which most drugs were discovered can be traced to random screening of thousands of compounds for efficacy against a given disease, accidental discoveries, or incremental improvements to existing drugs (Schwartzman, 1976). Over the past two decades, this 'random drug design' has been replaced by new technologies, using a more 'rational drug design' approach. Although this new drug discovery process is more efficient, the 'cost of innovation' has increased. The average cost of developing a new drug, or the cost of innovation, was estimated to be $359 million in 1992 (taking into account compounds that failed), compared with $231 million in 1987, only five years earlier, and $54 million in 1976 (Di Masi, J et al, 1991).

Government regulation is another factor restricting drug discovery, and may render large R&D investments useless, thus increasing costs. Following the thalidomide disaster in the 1960's, it became obvious that the public were potentially vulnerable. New regulations and policies were brought in, for example the Kefauver-Harris Amendments of 1962 introduced the need for an Investigational New Drug (IND) requirement, and proof of efficacy was added to the requirements of the New Drug Application (NDA) before approval for marketing. These regulations caused a substantial fall in the numbers of new chemical entities (NCE) introduced on to the US market by almost half (in the 1960's only 236 were introduced on to the market) (Redwood, 1998). Despite the fact that the number of products being produced has slowed down, the industry's financial commitment to research has steadily increased. Figure 1.1 illustrates the pattern of research spending (in 1980 US dollars) of the main countries in the industry during 1975-1989.

Figure1.1

R&D expenditures by the pharmaceutical industry in selected countries, 1975-1989 (constant 1980 US dollars)



Source: Estimates derived from data supplied by national pharmaceutical producers' associations and the Office of Health Economics, London (Balance, 1992).

Advertising

In the past, pharmaceutical manufacturers sold their products directly to the consumer rather than to doctors. Some firms spent large amounts of money on advertising to promote their branded products. However, with the introduction of government regulations to protect the public from potentially harmful substances, the channel of distribution changed. The market for drug products can now be divided into two main areas: the over-the-counter sector, and the prescription sector. The latter comprises the most important sector of the market, and can be sub-divided into the intra-mural market (hospital) and the extra-mural market (consumption at home). The extra-mural market is significantly larger in volume and value (De Wolf, 1988).

As a direct result of the change in distribution, companies have adapted their marketing strategies. The bulk of promotional expenditure is now being spent on company sales-teams, who visit individual physicians promoting the various drug products, and explaining the benefits and advantages to be gained. This process is known as 'detailing', and by the early 1970s all major companies started investing heavily in it, to the extent that the average US physician had 1.7 visits per week (Sutton, 1998). Furthermore, during the period 1983-1988, the sales staff of the world's top pharmaceutical firms grew by 50 per cent (Balance, 1992). This activity is extremely labour intensive, and as a result raises a company's costs considerably. However, some firms have invested heavily in detailing, in order to reap the benefits

of simultaneously launching their products across emerging global markets, and to remain competitive. Undoubtedly, Table 1.1 shows a widespread increase in the amount of money firms invest in promotional and distribution activity:

Table 1.1 *The Average Cost Structure in Selected Developed Market Economies, 1987 and 1988 (per cent of operating revenues).*

Cost component	*United States 1988*	*Switzerland 1987*	*Fed. Rep. of Germany 1988*
Manufacture	35	40	39
Marketing	22	24	27
R&D	10	15	14
Administration	6	6	7
Other Costs	6	5	6
Operating Profit	21	10	7

Source: For the United States, company reports for eleven leading firms with calculations by UNIDO; for Switzerland, SSCI (1988); for the Federal Republic of Germany, UNIDO calculations based on PMAG, Pharma Daten 90 (1990) (in Ballance, 1992).

The magnitude of the marketing investment is highlighted in Table 1.1. Moreover, when this figure is compared to R&D expenditure, it clearly outweighs it, and in some cases it is more than twice that of R&D. Although the data in Table 1.1 may appear a little outdated, Table 1.2 portrays the marketing and R&D expenditures during the period 1993-1995 of three of the leading pharmaceutical companies. Taking into account administration costs, marketing expenditure still prevails over R&D expenditure.

Table 1.2 Pharmaceutical Marketing and R&D Expenditure 1993-1995

	Merck & Co.		Eli Lilly		Bristol-Myers Squibb*	
Year	Marketing & admin. as % Sales	R&D as % Sales	Marketing & admin. as % Sales	R&D as % Sales	Marketing & admin. as % Sales	R&D as % Sales
1995	19.8	8.0	27.4	15.4	11.9	8.8
1994	21.2	8.2	25.0	14.7	11.4	9.2
1993	27.8	11.2	25.6	14.5	11.0	9.9

* = Advertising and Promotional Expenditure.

Source: Company Annual Reports 1995 (in McIntyre, 1999).

The rise in the over-the-counter drug sector has encouraged firms to invest heavily in advertising, as this can directly influence the consumer, and thus the sales level. An interesting point to note, however, is that investments in detailing may be limited. When all prescribing physicians have been contacted and informed of the products, further promotion may be ineffective. In this way, detailing efforts may reach a saturation level. The effect of marketing on the value of alpha, as a result, may remain quite small. For example, if detailing efforts of firms reach a saturation point, an outspending firm will not capture significant market share. In terms of the over-the-counter sector, an outspending firm may capture some market share: however, this sector is currently only a small part of the overall market, thus the effects would be minimal. If this sector increases substantially in the future, the structure of the market may be altered via the impact of advertising.

Customer loyalty can be created through promotional activity, and it is hoped to be strong enough to withstand the forces of competition. If a firm is promoting a product (especially in the case of a generic drug) before any other company, it can attain a first-mover advantage. The benefits of this can be great, as people will trust the original brand, because they know and are familiar with it. On the other hand, some people argue that the first-mover advantage may be limited in the case of pharmaceuticals, whereby some people may experience side effects. In this case, a competing brand may be more suitable for a certain subset of patients, and this company may effectively capture this share of the market.

The change in marketing activity has been of benefit to consumers in terms of getting the latest drugs to the market in the shortest amount of time. A worldwide launch can now be accomplished in only three years, where it once took eight to ten (Balance, 1992). Despite claims of biased influence, it is accepted that the promotional activity of the pharmaceutical industry is an important source of information for doctors. This translates to better advice for the consumer.

However, marketing expenditure has escalated, so much so that critics fear that it represents a misuse of market power. Interest groups, such as various government bodies and insurance companies, have also expressed concern about marketing costs rising disproportionately. Furthermore, appropriate action may be necessary should a pharmaceutical company try to pass its high costs onto consumers in the form of charging a premium price.

Concentration

It has been confirmed that the pharmaceutical industry is distinguished by high R&D and advertising/ marketing expenditure. I will now investigate if it is characterised by low concentration levels.

Whether concentration is high in the pharmaceutical industry essentially depends on the substitutability of products associated with different technologies. In spite of the effectiveness of R&D, if substitutability is low, concentration may also be low (Matraves, 1999). Much economics literature classifies pharmaceutical products as "therapeutic categories". Sutton uses "chemically related groups", as it better prepares the market for the purpose of applying the theory. Whatever the classification, what is eminent is that there are a wide variety of technologies to develop such products. As previously mentioned, there has been a change in research methodology. Temin argues that the industry was transformed after the Second World War, and that there is no one central product: 'the revolution in drug research allowed many different drugs to be discovered and promoted' (Temin, 1979). A firm's product range tends to be horizontally differentiated, making different versions of the successful drug rather than successive improvements. Therefore, differences across firms tend to be in the number of therapeutic categories covered. A further point is the issue of side effects. The varying biological make-up of consumers ensures that no 'one drug suits all'. In this light, firms cannot capture all of the market as their products may not suit all consumers. They may however, adapt their products, or extend their range in order to capture a share of the various sub-markets.

A firm may also extend their product range, or adapt their products via a merger or acquisition, where important technical know-how may be acquired. This has a direct effect on concentration. From the early 1960s until the end of the 1980s, the composition of the world's largest pharmaceutical companies was remarkably stable. At the end of the 1980s, the tranquillity of the industry was disrupted by an all-time high number of acquisitions and mergers. During the period 1988-1990 the estimated total value of mergers and acquisition was around $45 billion (Ballance, 1992). The pace has now slowed, but the industry has entered a new era, where the presence of acquisitions and mergers will be more commonplace.

What is also interesting about the recent merger/acquisition activity is that a lot of the firms involved have been large corporations. The 1989 merger of two large American and British companies- SmithKline Beckman (SKB) and Beecham-

attracted much attention and marked a turning point for the world's larger drug producers. Other recent merger/acquisition activity includes: BASF acquiring Boots (1995), Ciby-Geigy and Sandoz forming Novartis (1996), and Roche acquiring Boehringer Mannheim for $11 billion (1997).

Looking at concentration levels tells a different story. From a national perspective, concentration levels have been very stable. Using Cr4 data during the period 1987-1991, it is observed that concentration levels remained the same with slight fluctuations in some countries e.g. Italy decreased from 17 to 15, and the UK increased from 34 to 35. At the EU level, concentration decreased by three percentage points, which is a relatively large change over the seven year period (Matraves, 1999).

On the other hand, from a global point of view, concentration levels are changing. Up until 1988, the market shares of the leading twenty pharmaceutical firms remained quite stable, although their ranking changed. Between 1988 and 1995, however, the global market shares of the top ten firms increased from 25.4% to 31%, an increase of 5.6 percentage points in concentration. Furthermore, the firms ranking 11-20 increased their market share from 16.2% to 18.6%, an increase of 2.4% (Matraves, 1999).

Globalisation and the Cost of Innovation

The globalisation process has opened up markets for many companies, effectively increasing the market size. This is consistent with Sutton's (1991) theory, that as market size increases, this raises the incentive to escalate the level of advertising and/or R&D expenditure. Therefore, the observed escalation in R&D and advertising/marketing expenditure within the industry may be attributable to the increase in market size.

However, the relationship between market size and expenditure is limited in some areas, especially with regard to firm size. The increases in R&D and advertising/marketing have put major financial constraints on small companies. Henderson and Cockburn (1996) find that smaller firms are disadvantaged for two main reasons. Firstly, *ceteris paribus*, research programmes located within larger organisations are significantly more productive than rival programmes located in smaller firms. Secondly, this superior performance flows as much from economies of scope as it does from economies of scale per se. The increase in the cost of innovation also puts pressure on the smaller sized firm, and this pressure is further

reinforced because i) the return to new drugs is highly distorted, a few 'blockbusters' dominate the product ranges of the major firms and ii) only the top 30 drugs world-wide cover average R&D costs (Matraves, 1999).

The recent merger/acquisition activity also suggests that smaller firms are finding it difficult to survive in the changing industry environment. This certainly has implications for the market structure and raises the question whether it is necessary for a small company to merge in order to remain in the industry.

Conclusion

Many structural changes have occurred in the pharmaceutical industry, for example government regulation, changes in drug methodology and globalisation. These changes have had an impact on the levels of R&D and advertising/marketing, and we have witnessed a steady escalation of spending by companies in both.

Concentration has remained stable on a national level, but has increased on a global level. The increase in the cost of innovation, and also the effectiveness of advertising, as the over-the-counter market expands, have been two contributing factors to the increase in global concentration. An interesting point to note, however, is that the top four worldwide firms' combined market share is only 14.6% of the total market (from 1995 data). Compared to other industries this does not convey a highly consolidated market.

Admittedly, the disadvantages to smaller firms limit the fragmentation of the industry. Nonetheless, the industry still remains relatively fragmented, given that it is both R&D and advertising intensive. This is possibly due to the fact that the proliferation mechanism dominates over the escalation mechanism. From the available evidence, one can only conclude that the pharmaceutical industry, consistent with Sutton's theory, is that of a Type 2 low-alpha industry.

Bibliography

Ballance, R. (1992) *The World's Pharmaceutical Industries: An international Perspective on Innovation, Competition and Policy.* Cheltenham: Edward Elgar

Di Masi, J. et al. "Cost of Innovation in the Pharmaceutical Industry". *Journal of Health Economics.* 10. (1991: 107-142).

De Wolf, P. The Pharmaceutical Industry: Structure, Intervention and Competitive Strength. In: de Jong, H. W.(ed). (1988) *The Structure of European Industry.* The Hague: Nijhoff.

Henderson, R. and Cockburn I. "Scale, scope, and spillovers: the determinants of research productivity in drug research". *RAND Journal of Economics.* Vol.27 No.1. (1996: 32-59).

Matraves, C. "Market Structure, R&D and Advertising in the Pharmaceutical Industry". *The Journal of Industrial Economics Vol. XLVII.* (June 1999).

McIntyre, A. (1999) *Key Issues In The Pharmaceutical Industry.* Chichester: Wiley.

Redwood, H. (1988) *The Pharmaceutical Industry- Trends, Problems, and Achievements.* Felixstowe: Oldwicks Press.

Scrip Magazine. *World Pharmaceutical News.*1433.

Schmalensee, R. "Sunk Costs and Market Structure: A Review Article". *Journal of Industrial Economics.* (1992: 125-134)

Schwartzman, D. (1976) *Innovation in the Pharmaceutical Industry.* Baltimore: John Hopkins University Press.

Sutton, J. (1991) *Sunk Costs and Market Structure: Price Competition, Advertising and the Evolution of Concentration.* London: MIT Press.

Sutton, J. (1998) *Technology and Market Structure: Theory and History.* London: MIT Press.

Temin, P. Technology, Regulation and Market Structure in the Modern Pharmaceutical Industry'. *Bell Journal of Economics.10.* (1979: 429-446).

Microsoft's Abuse of Dominant Market Position

Edward O'Brien – Senior Sophister

Microsoft is one of the largest corporations in the world, and dominates the market in operating systems for Intel-compatible PCs. They were recently found guilty of abusing their position in that market by the US government, a very prominent application of economic theory on monopolistic competition. Using examples such as Microsoft's bundling of Internet Explorer with Windows '95, Edward O'Brien describes the valid economic arguments employed in meeting that decision.

Virtually everything I did may be vulnerable on appeal.
- Judge Thomas Penfield Jackson.

Introduction

In the case of the Microsoft Corporation versus the United States Government, the court of Judge Jackson found that 'Microsoft engaged in illegal and anti-competitive conduct to maintain its monopoly in the market for Intel compatible PC operating systems. The court also has found that Microsoft attempted to monopolise the market for Browsers.'[1] As was widely anticipated, Microsoft has in fact appealed the verdict. The results, however, in this context may not be relevant. In this essay, I intend to prove, using sound economic arguments, that Microsoft was in fact guilty of anti-competitive behaviour. This will show the Findings of Fact to be correct and true, irrespective of the Conclusions of Law, suggested Remedies, or any appeal findings.

In the analysis that follows, I shall outline and discuss the following:

- Microsoft's power in the relevant market
- Emerging threats to Microsoft
- Theory of Vertical Restraints and Predation
- Application of these Theories to this case
- An Economic Verdict
- Welfare
- Concluding Summary

[1] Declaration of Carl Shapiro.

Finally, it is important to note some restrictions I have placed on this analysis. First, I shall consider only the economic content of the Findings of Fact for this case. The suggested Remedies shall not be considered. And second, I shall mainly consider Microsoft's actions regarding Netscape Navigator. I shall by and large ignore their actions regarding Sun's implementation of Java.

Microsoft's Power in the Relevant Market

Although it may be argued that this section is of little interest, it is still an important aspect of the case. One must consider Microsoft's position in the market place, before passing judgement on its subsequent behaviour. Therefore, although brief, this section is fundamentally important.

1. The *relevant market* is the licensing of all Intel compatible PC operating systems, worldwide. At present, no product is available which could readily act as a substitute, without incurring substantial costs for the user.[2]

    - Possible *alternatives* include the Mac operating system, manufactured by Apple Computers, a range of Information appliances, or Network computing and Middleware. However each of these alternatives has an associated cost, be it price, required training, lack of features, or required innovation.

    - *Network effects* are also relevant. A consumer will only purchase an operating system (OS) if they believe a large number of applications will be available for that OS, presently, and into the future. Similarly, Independent Software Vendors (ISV's), will only produce applications, implying large sunk costs, if they believe consumer demand exists for applications for that OS. Any new OS will have to attract enough support from both consumers and ISV's to survive. This will naturally inhibit the entry of any firm, who will have to expend considerable sunk, and hence irrevocable, costs, to enter the market for OS. This 'leader advantage' rewards the innovators, the first firms who entered the market. It rewards them with the position of dominant incumbency. Due to the problem of network effects, it is difficult for any firm to contest the dominance of the incumbent. This barrier to entry is very important.

[2] Findings of Fact, II, § 18.

This defines the relevant market. As argued no viable alternatives exist, or are likely to exist in the short term. The most likely alternatives to arise may be from Network computing or the use of Middleware. These shall require, however, further innovation and are several years away at best.

2. If Microsoft is to be accused of maintaining and extending its monopoly power, it is important to establish and to evaluate that power.

    - A useful indicator of Monopoly power is market share. It has been estimated that Microsoft's share of the relevant market (that for Intel compatible PC operating systems), is 95%, and growing.[3] This fact is further confirmed by the Original Equipment Manufacturers (OEM's). They are of the opinion that no substitute exists for Windows, a fact borne out in their minimal output of PC's without that OS pre-installed.
    - Another intuitive measure of monopoly power are barriers to entry. As previously mentioned, network effects are important. Over 70,000 applications have been written for Windows, Microsoft's Operating System. Given this fact, it is difficult to attract consumers or ISV's away from it. Also, corporate consumers are likely to be attracted to a system so familiar to its employees. This is known as the 'Applications' barrier to entry. All of this makes for a 'positive feedback loop' for Microsoft. However, for an opponent, attempting to gain entry to the market, this would be a vicious cycle. Empirical evidence also points to the existence of barriers to entry.
    - Microsoft's pricing behaviour is indicative of monopoly power. It gives no consideration to the pricing behaviour of their competitors. When launching Windows'98, Microsoft raised the price of Windows'95 to the level of the new software, thus encouraging maximum take up on its new software. This is not the behaviour of a company subject to competitive markets. Also, a Microsoft report claimed it could charge $49 for an upgrade to Windows'98. Instead it opted to charge $89.

The above evidence, of market share, barriers to entry, and pricing behaviour, combined with various actions Microsoft took against several firms, of which I shall speak more of later, suggest that Microsoft enjoys considerable monopoly power in this market, and is likely to do so for the foreseeable future.

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[3] Findings of Fact, III, § 35.

The Emerging Threats

The 'applications' barrier to entry stands due to the cost and difficulty of 'porting' applications between OS. So while Windows enjoys 70,000 applications, Microsoft is safe in the knowledge, that very few of these shall ever be 'ported' to other OS. However, Middleware sits on top of the underlying OS, and the applications run off the Middleware. This in effect makes the OS redundant from an applications viewpoint. The Middleware can then be 'ported' to all the various OS in use. However, there is no need to 'port' the applications, they just run off the Middleware. In the mid-1990's, Microsoft became aware that such a threat existed. They feared that this innovation may attract large numbers of developers. This could seriously damage the 'applications' barrier to entry. To the consumer, the choice of OS may become irrelevant, as Middleware becomes prominent. Open source developments such as Linux, an OS, available free gratis, could seriously damage Microsoft's profitability.

One of the major threats identified by Microsoft came from Netscape's web browser. It had the potential to severely damage Microsoft because:

- Netscape Navigator, unlike many other competitors, was a complement to Windows, not a substitute. It is an application used on Windows, not an alternative. This allowed Navigator access to Microsoft's vast installed base.

- Navigator can serve as a platform for other software. In other words, it is Middleware. It can allow applications and network computing to operate independently of the OS.

- Navigator has been 'ported' to more than fifteen different operating systems, allowing applications written for it to be used on any one of these operating systems (see above).

- Navigator also arrived at a time when consumer interest in the Internet was booming. After its launch in December 1994, it enjoyed far higher usage than any other web browser.

These facts did not go unnoticed at Microsoft. Bill Gates spoke of a "new competitor 'born' on the Internet." Those responsible for Corporate Strategy were "deeply concerned that Netscape was moving its business in a direction that could

diminish that applications barrier to entry."[4] Also, it is important to note that Netscape were not the only firm investing in this technology. Other firms' actions, such as Intel and IBM, were also been scrutinised by Microsoft.

So far, the scene has been set, Microsoft's position of dominance has been established, and the main threat to this position has been outlined. Microsoft's acknowledgement of this threat is also clear. I shall now proceed to discuss Microsoft's reaction to this threat. This shall be the crux of the analysis. I shall begin with some background theory.

Theory of Predation and Vertical Restraints

This section outlines the theory behind the main economic arguments which will follow. The essence of Predation and vertical restraints is market foreclosure. It is defined as the commercial practices that reduce the buyer's access to a supplier (upstream foreclosure), and/or limit the suppliers access to a buyer (downstream foreclosure). (Tirole, 1988) This can be achieved by various methods.

1. Predatory pricing is a strategy that requires a dominant incumbent firm to cut its prices below its rival's average cost, even if this means accepting short-run losses, to drive rivals from the market. Once the rival leaves the market, the incumbent raises prices and collects sufficiently large economic profits, the gains from monopoly power (Martin, 1993).

   - Non-Game-Theoretic models have however, suggested that predatory pricing will not work. With perfectly functioning Capital markets, the rival firms receive capital to stay in the market, motivated by the economic profits available in that market. In this model, economic profits fail to materialise. This model may also fail if consumers can anticipate the actions of the incumbent, and bear its rivals higher prices, for a better future. Again, economic profits will not arise. This relies on consumers holding perfect information and being rational.

   - Game Theory models have suggested that Predation may succeed. Given the requirements of the Non-Game-Theoretic models, and intuition, it is safe to assume that predatory pricing can in fact succeed.

[4] Findings of Fact, IV, § 72.

Predatory pricing can foreclose a market to a firm contemplating entry. A dominant incumbent may have the desire and ability to wage a protracted price war, to maintain monopoly power in a market. As a result, few firms will contemplate entry.

2. Vertical Restraints are the contractual impositions of an upstream firm (manufacturer) on a downstream firm (distributor or retailer). These restrictions may involve price, sales territory, or customer classes. Vertical restraints have traditionally been viewed as "an instrument of market power or as a device for correcting market failure, in the market for distribution services" (Martin, 1993). So vertical restraints may be required so that a manufacturer can obtain services from a dealer or can simply be a tool of market power.

   - Exclusive Dealing or Purchasing is a vertical restraint. In this instance, a distributor agrees to purchase from only one manufacturer. The contract between the two comprises of a price, and also damages, paid to the manufacturer, if the distributor uses another manufacturer. Aghion and Bolton (1987) state that a buyer is willing to enter into such a contract because he is as well off with it as without it. [5] The damages clause allows the incumbent to appropriate some of the price charged by any competitor. Exclusive dealing may also use long term contracts to hold competitors out of the market, thereby closing that market to them.

   - Tying and Bundling is another vertical restraint. Whinston (1990) shows that a firm with a monopoly in one market can reduce the profitability of a rival in another market, perhaps to the point of monopolising the second market as well.[6] Whinston's leverage argument implies that tying and bundling can be used to exclude rivals and extend a monopoly from one market to another. If this practice is observed over time, one expects that it is privately profitable.

   - Incompatibility is the final vertical restraint I shall look at. In this case, the dominant manufacturer makes his basic good incompatible with the complimentary goods sold by his rivals. Matutes and Regibeau (1986) found that a manufacturer that makes its systems incompatible with other systems imposes a tie-in of its various components (Tirole, 1988). Whereas compatibility raises consumer demand (by better meeting consumer tastes),

[5] Martin, chapter 12.

[6] Tirole, chapter 8

and softens price competition, incompatibility has the opposite effect. It reduces demand, and increases price competition, perhaps resulting in the exit of competing firms. Incompatibility is a further extension of the leverage theory. A dominant firm in one market can foreclose another market by creating incompatibility between the goods of each market.

Both predatory pricing and vertical restraints act to erect barriers to entry. Any firm contemplating entry, is liable to be subject to a price war with his own prices being severely undercut. That firm may have to suffer exclusive dealing, tying and bundling, or deliberate incompatibility. These barriers act to foreclose a market. The dominant firm will attempt to squeeze any competitor out of the market, almost before they enter it.

Microsoft and Barriers to Entry

At this point, an important distinction must be made. The applications barrier to entry exists. This is not in question (see Section II). It is a result of the leader advantage in the technology sector. Microsoft has inherited its position, however, if Microsoft's dominance was threatened, and the applications barrier to entry was deemed to be falling, and then Microsoft may react. By using the methods outlined above, Microsoft may erect barriers to entry, unrelated to the applications barrier to entry, but used to protect the applications barrier to entry. In effect, Microsoft erected barriers to entry to protect its application barrier to entry. In the face of a threat by Navigator (see section III), this is exactly what Microsoft set out to do. I shall now outline Microsoft's actions, and emphasise how these were in breach of the Anti-trust regulations of the USA.

1. *Netscape's Development of Navigator as a platform.* Microsoft's fear was that a web Browser could be used to host network computing or Middleware (see Section III). This could potentially erode the applications barrier to entry. Apart from this, Microsoft also wanted to set the standard for all systems on the Internet, and gain the "leader advantage", as it holds for OS. Microsoft was keen that Netscape should develop a browser that was complementary to Windows (but set to Microsoft's standards), and not a browser that provided an alternative platform for network centric applications. If Netscape agreed, Microsoft would assist Netscape in its development. If not, it would view Netscape as its competitor. In this case, Microsoft attempted to foreclose the market for alternative platforms, by using its leverage in the market for OS. Netscape could benefit by consent, but non-agreement would result in competition with a large

monopolist, and all its resources. Basically, Microsoft was attempting to remove the threat to its barrier to entry, before it became a reality. However, it failed, at least for now. Netscape opted not to enter into any agreements with Microsoft, however, Microsoft's relationship with Netscape suffered after this. As expected Microsoft began to "lever" Netscape, as it now was a competitor. This was achieved by withholding crucial technical information. This was required by Netscape to "port" Navigator to Windows'95. This resulted in Netscape postponing the launch of its Windows'95 browser. As a result, they failed to capitalise on sales at the launch of the new OS, and also missed the holiday season of 1995. This damage was inflicted by Microsoft on Netscape for refusal to give up its aspirations to develop an "alternative platform".

2. *Microsoft's actions towards Intel and IBM.* Netscape was not the only company to be developing software that alarmed Microsoft. Intel not only produced microprocessors, but also some software. When Microsoft became aware of Intel's development of OS independent platforms, they reacted. Microsoft informed Intel that it would not support future lines of Intel's processors, unless they halted the software work. Intel is indirectly dependent on Microsoft, because the vast majority of PC's unto which Windows is installed are based on Intel processors. If Microsoft ceased to support Intel, demand for their processors would fall dramatically. Therefore they felt they had to comply, and so, they did. This is evidence of exclusive dealing. Intel would have severe difficulty in selling processors if they were no longer compatible with Windows, and if Microsoft informed the OEM's that it no longer supported the Intel processors. IBM, amongst others, also faced the wrath of Microsoft. Like Intel, it to had software interests. While IBM was an OEM consumer of Microsoft software, it was also a competitor in the software market. Microsoft did not value this competition and proceeded to push IBM away from these markets. Microsoft offered a valuable deal to IBM, to induce it away from competition. This deal was potentially worth $48 million dollars to IBM.[7] When IBM refused the deal, Microsoft retaliated. It refused IBM a license for Windows'95 and access to the master code for that product. IBM finally received this information only fifteen minutes before the official launch of Windows'95. As a result, IBM lost substantial revenue in the post-launch sales boom, and lost considerable ground to its competitors. IBM believes they lost accounts worth $180 million as a direct result. Again, this is evidence of exclusive dealing. IBM's competitors were receiving preferential treatment from Microsoft, as they were compliant. IBM suffered exclusion, or at least partial exclusion, as it would not

[7] Findings of Fact, V, § 118.

"stop loading its PC" systems with software that threatened Microsoft's "interests".[8]

3. *Developing Internet Explorer (IE).* Microsoft was determined that Navigator would not become the standard software employed to browse the web. If Microsoft could demonstrate the Navigator would not become the 'standard', it would be unlikely to attract developer attention. And so, the applications barrier to Windows would remain intact. To this end, Microsoft deemed it necessary to expend huge effort to develop IE so it could compete with the then superior Navigator. Microsoft achieved this aim, with IE4.0 being considered the equal of Navigator. While this action alone is not anti-competitive, the motivations of Microsoft, and it further actions, may be questionable, as can next be seen.

4. *Giving it all away.* Microsoft's next step was telling. After the costly development of IE, it was to be given away for free, not only to consumers, but also to ISV's and Apple also. This form of predatory pricing would allow Microsoft maximise uptake of IE, to the detriment of Navigator. Microsoft was willing to forego substantial revenue, to protect its applications barrier to entry. Navigator was further hurt by the fact that its revenue would suffer. It too would have to give up charging for a license for Navigator. Also, some firms were to be rewarded for the promotion of IE usage. Internet Access Providers (IAP'S) and Internet Content Providers (ICP's), were rewarded for 'a commitment to promote and distribute IE, to inhibit promotion and distribution of Navigator, and to employ technologies that...relied on Microsoft's Internet technologies rather than those provided by Navigator'.[9] All of this effort and expense had not resulted in a desire to further improve Windows. What possible motivation might there be? 'This investment was only profitable to the extent that it protected the applications barrier to entry'.[10] This investment was only possible because of the resources Microsoft has gained from its monopolistic position. Whinston's leverage argument can be applied here.

5. *Channels of Distribution.* Although Microsoft now had a Browser product to match Navigator in quality, it certainly did not match it in quantity. Navigator

[8] Findings of Fact, V, § 129.

[9] Findings of Fact, V, § 139.

[10] Findings of Fact, V, § 141.

enjoyed a large installed base. Microsoft feared that despite its product now being as good, users were unlikely to switch from one product to the other, and this stage. And Microsoft had every determination that IE should achieve dominance in the market for Browsers. In order to achieve this they sought to exclude Navigator from the most important channels of distribution, naturally, to the benefit of IE. The two most important channels were OEM's and IAP's. For the consumer, the PC is the first point of contact for web access, and if this does not come with a Browser pre-installed, then the next most likely source is the consumer's IAP. Microsoft had identified these two channels as the most important, and targeted them accordingly.

Although it may be argued that web Browsers are separate products, Microsoft bundled IE with its Windows package. Apart from a brief period, Microsoft never allowed OEM's to ship Windows'95 without IE. This did not close the OEM route to Navigator, but OEM's were not inclined to install two Browsers onto each PC. Also, Microsoft endeavoured to bind IE to windows in such a way, that running any other Browser through Windows would be a 'jolting experience'.[11] Such was the level of binding that any attempts to remove IE could result in the disabling of Windows itself. So in general, one would be very disinclined to use Navigator with Windows'95, as one could encounter a host of problems, such as privacy breaches, degradation of performance, and increased incompatibility. The court found no technical justification for the binding of IE to Windows'95. This use of tying and bundling is further evidence of Microsoft's use it's monopoly power in the OS market, to leverage the market for Browsers. Designed incompatibility is a further vertical restraint.

Microsoft, however, was not finished with the OEM's yet. In order to prevent resourceful OEM's from pursuing the use of Navigator by further means, 'Microsoft threatened to terminate the Windows licence of any OEM that removed...chosen icons and program entries from the...desktop or the "Start" menu. It threatened similar punishment for OEM's who added programs that promoted third-party software to the Windows "boot" sequence'.[12] These actions ensured OEM could not unduly affect Microsoft's ambitions for IE with other interests.

Microsoft adopted a similar approach with IAP's. It offered a series of inducements to those IAP's who would promote IE at the expense of Navigator.

[11] Findings of Fact, V, § 160.

[12] Findings of Fact, V, §203.

Only after it had secured this route, did Microsoft relax the conditions imposed on the OEM's as above.

Apart from these two important channels, Microsoft also levered ICP's, ISV's, and Apple, inducing them by various means, to promote IE at the expense of Navigator. In the case of Apple, Microsoft threatened to cease production of Mac Office, a product vital to the continued success of Apple, if Apple did not support IE. These actions also suggest exclusive dealing. If these companies did not comply with the wishes of Microsoft, their access to Microsoft's products, vital for their survival, may be cut off.

Unsurprisingly, Microsoft's success was undoubted. 'The fact that Netscape was forced to distribute tens of millions of copies of Navigator through high-cost carpet bombing in order to obtain a relatively small number of new users only discloses the extent of Microsoft's success in excluding Navigator from the channels that lead most effectively to Browser usage'.[13] Apart from this, the data speaks for itself. From early 1996, to mid-1998, Navigators share of Browser usage fell from above 70% to around 50%, while IE usage grew from 5% to 50%. Also, the take up rate of IE was higher than that of Navigator. In other words, IE's share is still growing.

The Economic Verdict

The last section outlines the practices Microsoft engaged to protect and extend its monopoly. Below, these facts are summarised:

1. Attempting to use their Monopoly power in the OS market to leverage Netscape, and hence foreclose the potential market for 'alternative platforms'. This allowed Microsoft to maintain its monopoly, and extend it into the market for Browsers and future potential markets.

2. Coercing Intel and IBM through exclusive dealing. If these companies continued to operate as competitors to Microsoft, they would no longer be supported. Since Microsoft holds the monopoly for OS, they would be unable to continue their businesses.

[13] Findings of Fact, V, §357.

3. Used its considerable resources, results of a monopoly, to develop IE. While this alone is not anti-competitive, the motivations are. Microsoft's prime reason for developing IE was to protect its applications barrier to entry, by removing the potential threat of Navigator. The creation of IE was necessary to achieve this. Again, Microsoft used its dominance in the market for OS to gain dominance in the market for Browsers.

4. By not charging for IE and for Tying and Bundling with Windows. By giving IE away free gratis, Microsoft lost substantial revenue. However, knowing Netscape relied on revenue from Navigator, Microsoft believed that this predatory pricing could further promote IE. A dominant incumbent, can afford to give it away for free, while it waits for the competition to exit the market. This further ties in with Microsoft's decision to expend huge effort in developing IE. It gave Microsoft the ability to attack Netscape's revenue source. Also, Microsoft tied and bundled IE with Windows. By tying, Windows was made incompatible with other Browsers. This, combined with the decision to bundle, furthered Microsoft's interests. Both tying and bundling are methods by which a monopolist can leverage power from one market to another (see Section IV).

5. Closing the Channels of distribution through exclusive dealing and incompatibility. Microsoft coerced both OEM's and IAP's to promote IE at the expense of Navigator. If these groups failed to comply, they would not be granted 'preferential' treatment from Microsoft, treatment that was vital for their survival, again, leverage from one market to another. Microsoft also ensured these groups configured their systems to favour IE at the expense of other Browsers. This ensured a degraded performance, and more, should anybody attempt to use another Browser on those systems. This deliberate incompatibility furthered Microsoft's monopoly.

So in general, it can be said that Microsoft used various methods, to foreclose markets to Netscape, Intel and IBM. They did so using their own monopoly power in the market for Operating Systems. This maintained their current monopoly, by protecting the applications barrier to entry, and extended their monopoly into the market for Browsers. This extension was deemed necessary by Microsoft to protect its applications barrier. In erecting new barriers through predatory pricing, exclusive dealing, designed incompatibility, and tying and binding, Microsoft ceded control of the Browser market, monopolised it, and consequently protected its OS monopoly. In my estimation, this behaviour is in breach of Anti-trust regulation.

Welfare

Critics of the Court findings of this case, such as R. Schmalensee, have raised the issue of consumer welfare. It is argued that if consumer welfare has not been harmed, then Microsoft cannot be guilty of anti-competitive behaviour. These arguments assert that Microsoft behaviour actually increased consumer welfare in these markets, by improving the quality of Browser software, lowering its cost, and increasing its availability.

However, Microsoft has also been accused of harming consumer welfare. They ignored the demand for an OS without a Browser; they restricted OEM's from making their PC's more user friendly, and created confusion and frustration among consumers; they degraded the performance of those PC's; and they actively deprived consumers of software innovation.

In my own opinion, I do not think that consumer welfare is as relevant to this case as other Anti-trust cases. Due to the pace of change in the computer industry, is it ever possible to gauge welfare correctly? The market is dynamic as innovations occurs so rapidly. Also, as I have argued, Microsoft acted to protect itself from future threats. Who is to say what may have occurred in the future, had

Microsoft not distorted the marketplace. We cannot assess future damages where innovation is so dominant.

Conclusion

In summary,

1. Microsoft holds monopoly power in the market for operating systems, to such an extent that no viable substitute for Microsoft's products exist. This monopoly is based on 'leader advantage' and network effects, and is verifiable by measure of market share.
2. Several threats emerged that had the potential to erode Microsoft's monopoly, in bypassing the importance of operating systems. The most notable threat came from Netscape.
3. Having identified these threats, Microsoft set about counteracting them. By further developing its own software, and inducing many firms to 'tow the line', Microsoft effectively removed the threats to its business,

and monopolised the market for Browsers in the process.

4. The methods used by Microsoft to achieve the above, exclusive dealing, designed incompatibility, predatory pricing and tying and binding are all in this context in breach of anti-trust regulation.
5. Welfare issues may not be relevant to this case, as the technology sector is in a state of dynamic innovation.

Finally, to finish as I began, in the words of Judge Thomas Penfield Jackson:

> *Through its conduct toward Netscape, IBM, Compaq, Intel and others, Microsoft has demonstrated that it will use its prodigious market power and immense profits to harm any firm that insists on pursuing initiatives that could intensify competition against one of Microsoft's core products. Microsoft's past success in hurting such companies and stifling innovation deters investment in technologies and business that exhibit the potential to threaten Microsoft. The ultimate result is that some innovations that would truly benefit consumers never occur for the sole reason that they do not coincide with Microsoft's self-interest.*[14]

[14] Findings of Fact. VII, § 412.

Bibliography

Carlton, D & J. Perloff (1990) *Modern Industrial Organisation.* London: Scott, Foresman, and Company.

Evans, D.S. & R. Schmalensee. (2000). The Economics of the Microsoft Antitrust Case in the United States: An Updated Post-Trial Primer, *as published on* www.neramicrosoft.com.

Evans, D.S. & R. Schmalensee. (2000). Be nice to your Rivals: How the Government is selling an Antitrust case without consumer harm *in* United States v. Microsoft, *in* Did Microsoft Harm Consumers, AEI-Brookings Centre for Regulatory Studies.

Martin, S. (1993) *Advanced Industrial Economics.* Oxford: Blackwell Publishers.

Scherer, M. & D. Ross (1990) *Industrial Market Structure and Economic Performance.* Boston: Houghton Mifflin Company.

Schmalensee, R. (2000) *Applications Barrier to Entry, Consumer Benefits, Market Foreclosure, Predatory Behaviour, and Windows Prices.* Schmalensee Rebuttal Testimony, *as published on* www.neramicrosoft.com.

Tirole, J. (1988) *The theory of Industrial Organisation.* London: The MIT Press.

United States District Court for The District of Columbia, Civil Action No. 98-1232 (TPJ) and No. 98-1233 (TPJ), Findings of Fact, 5th November 1999.

United States District Court for The District of Columbia, Civil Action No. 98-1232 (TPJ) and No. 98-1233 (TPJ), Declaration of Carl Shapiro, 28th April 2000.

Irish Air Traffic Control: Primed for Privatisation

Paul Geaney - Senior Sophister

Privatisation is a topical issue at the moment, with many semi-state bodies being suggested. Paul Geaney examines the case of Ireland's Air Traffic Control (ATC), where the sole provider is expected to regulate itself. He rejects suggestions that privatisation will lead to monopoly rents, highlighting competition for the market. He also sees no danger of a reduction in safety standards. Thus, he concludes that privatisation is necessary to hope for any Irish-run ATC in the future.

Introduction

One can't help but smile wryly at recent events in Britain. The proposal by the British government to create a Public Private Partnership for their National Air Traffic Service (NATS) has caused the now customary furore among their left wing press. A cursory glance at the facts shows that the very elements of privatisation most feared by people such as falling safety standards, failing service and profiteering, are in fact least likely when an industry is opened to the rigours of competition. Below, I have hopefully taken something more than just a cursory glance at the major issues surrounding privatisation of the industry, specifically looking at the future of Irish Air Traffic Control (ATC) provision. My analysis starts with a critique of the system presently in operation, which has uncomfortably married regulation and service provision, with both jobs designated to the same organisation. With the separation of these, which I believe should be undertaken without delay, comes the dilemma of what form the resulting entities should take. Having examined that, I present my case for the privatisation of ATC service provision in Ireland. The conclusion I come to is an uncompromising one: prompt privatisation will provide a myriad of opportunities now and in the future, failure to privatise will consign Irish run ATC to history.

The concept of an organisation being both the sole producer and the regulator of a market has long since been dismissed for its lack of transparency and the potential for conflicts of interest that arise from such a concentration of power. Subsequently, and to the benefit of all, lawmakers and consumers alike rarely countenance such scenarios. However the Air Traffic Control (ATC) business is a sorry exception. For example, the Irish Aviation Authority (IAA) is the monopoly provider of en-route air traffic services in Ireland, and in the Atlantic airspace over

which Ireland has jurisdiction[1]. For safety reasons all domestic en-route ATC providers are monopolists. This I will show, contrary to conventional wisdom, does not preclude competition, and will be efficient if privatised. The problem lies with another role delegated by the government to the IAA, as outlined in the Irish Aviation Authority Act of 1993[2].

The Act made the Authority the regulator of the ATC industry, effectively making the service provision wing of the company answerable to the regulatory wing, both of whom are answerable to the same board of directors and Chief Executive, a post held since by Mr. Brian McDonnell. It is important to make clear just how unsatisfactory a situation this is. The role of the regulator of any industry is to ensure that the companies in the industry over which it has jurisdiction act in accordance with the regulations as set out by it. So if a company was to act in a manner which contravened those rules, the regulator must take action against the firm, most likely against its management. So if a regulatory body is headed by the same person as the only service provider (company) in the industry, and thus the person they are likely to be criticising, the potential for conflicts of interest are great and no matter how objective this amalgamated organisation is in operation, the independence of the regulatory wing will always be brought into question. Though the IAA has always retained the confidence of its customers (the airlines) and the government, the existence of perceived or potential conflicts and lack of regulatory autonomy is damaging to the Authority. Therefore the regulatory and service provision wings of the Authority must be separated. This is a policy which has been followed by aviation authorities elsewhere, for example in Canada and the Netherlands, it has been called for in the UK since the late 1980s and is a stated objective of the EU Commission. It is also in line with a broader domestic government policy that has seen the decoupling of regulation from service provision in the utilities sector.

If we separate the two bodies, what structure should the newly independent entities have? I believe that question answers itself when we examine the culture of

[1] The Irish air traffic service and its British counterpart (NATS) have joint jurisdiction over the airspace between 15 and 30 degrees latitude, with the remainder of the Atlantic airspace to the west controlled by NavCanada.

[2] The IAA Act incorporated the IAA as a government sponsored commercial body, reporting to the Minister of the Environment, Transport and the Regions but having broad operational independence from her Department.

a regulatory body and that of a provider of services to customers. The cultures of these two types of organisation, as pointed out by Mr. Philip Hughes of the IAA[3], should be at opposite ends of the spectrum. It is accepted that regulators should never be profit orientated and that no incentive should be given for them to be so. The regulator should be concerned solely with the performance of companies in its industry with regard to the rules of that industry and of taking action when those rules are breached. This is also the opinion of the Chief Executive of the IAA, Mr. Brian McDonnell[4]. He believes that the state has a role to play in the regulation of the ATS industry, but this is best delegated to a semi-State body rather than dealt with in the appropriate government department. Such a structure would allow for independent regulation, without financial constraints or concerns. Mr. McDonnell is also of the opinion that, as the signatory of all international civil aviation agreements, it is the government that must be responsible for their implementation.

Both men also agree that the essence of a service provider should be to focus on the provision of the best possible service by the most efficient means. The government has proven itself incapable of this for all commercial services it has provided. This is due to the absence of competition and a lack of performance-based incentives. It is however, far more efficient for services to be provided by the private sector. Optimal efficiency levels can only be achieved with privatisation of ATC and the subsequent goals of achieving commercial returns while being competitive.

Some people argue however that the ATC sector does not lend itself to competition because the nature of the industry dictates that only one provider of the service can operate in each country's airspace. Therefore the chosen operator must be a monopolist. It is true that there can only be one operator in a region, for safety reasons. The notion of competing ATC providers struggling for competitive advantage and vying with each other for the quickest routes through the shared airspace could lead to safety problems, something that is not countenanced in the industry. So if the business is privatised, only one firm can operate in it. While the government fills the role of sole provider, some argue that charges are kept to a minimum as the IAA only looks to recover costs. The argument goes that private monopolies will want to increase charges so as to boost profits and with no competition will go unpunished for doing so. This is conventional wisdom and has

[3] In an interview conducted by myself with Philip Hughes, one of the project managers for the IAA on the 'Airline Bid' conglomerate, presently vying for the licence to run NATS.

[4] From a recent interview conducted by the author.

led to economic regulation of the industry wherever it has been privatised (for example the proposals for privatising NATS). Even Mr. McDonnell would support such a step. He argues that an economic regulator should be allowed to measure the firms unit costs against a European benchmark, and if they are too high, should be given the powers to force the company back into line[5]. However I don't believe this is necessary. In an industry where there cannot be competition in the market, there can be competition for the market. This will ensure that the licensed provider has an incentive to price fairly and provide the best service possible.

Economic doctrine tells us that in an industry where one firm can provide a service more efficiently than two or more firms, then just one firm will survive. If this firm is subsequently left unregulated it will set price and output at monopoly levels in order to maximise its profits. So in practical terms, the privatised monopolistic ATC provider would charge airlines significantly more than it would cost to provide them with the service. Therefore a government sponsored economic regulator is needed to ensure that airlines are not overcharged and that prices are kept at reasonable levels.

However in his article, "Why Regulate Utilities?", Harold Demsetz argues that this is based on a flawed interpretation of the concept of competition. It was he who first argued in a modern context, that where you cannot have competition in a market, you can have competition for the market. Although Demsetz was writing about the privatisation of utilities, such as electricity supply, I believe the underlying principle is just as apt for ATC provision. If we assume for now that there are a number of bidders, bidding for the sole licence to provide ATC services in Irish airspace, and that that licence is renewable every five years, competition for the licence will push down the per unit cost that will be charged by the victor. This is because the bidder that fulfils the government's pre-requisites and has the lowest bid price for the provision of the service will win the licence. In other words, there is no incentive to set your charges higher than they should be, as you will use the "beauty contest" being held for the allocation of the licence. Nor is there any incentive for the successful bidder to renege on the price he proposed to charge while bidding; if he increases his prices, he will lose out to a more competitive bidder when the licence comes up for renewal. Equally if he fails to pass on cost reductions to customers, another bidder will next time around. Such a transparent system removes any incentive for the service provider to increase charges to "unreasonable" or monopolistic levels and will ensure that market driven efficiency prevails, which is

[5] From a recent interview conducted by the author.

more dynamic and healthy than "efficiency" imposed from above.

Returning briefly to the assumption that there will be many bidders, which is necessary for the theory to hold (because without a number of bidders, there is no competition). There is little doubt that such a number of bidders would compete for the ATC licence. Irish ATC is a low risk, high growth and profitable business, making it attractive to bidders. Also, the cost of bidding is low and the ATC infrastructure is in place, so there are no barriers to entering the bidding contest. This has been verified by the fact that nine bids were originally considered by the British government in its sell-off of NATS, with three bidders now in the final round.

So, given that there would be a pool of bidders, each of whom would act independently to gain the licence to provide all en-route ATC services for a pre-determined period of time, I see no need for economic regulation of the industry. The price charged would be set through a competitive bidding process and maintained by the promise of similar bidding processes in the future, ensuring that charges would not deviate significantly from the per-unit cost incurred by the firm.

It is noteworthy that the bidders must not necessarily be for-profit organisations. The Canadian model is illustrative in that its ATC provider NavCanada is a non-share-capital corporation (or trust). Its board comprises of representatives of the airlines, unions, government and 'independents'. The composition of the board is not particularly significant, what is important is that:

> *'it does not distribute profits; any excess earnings are re-invested in the company, kept as operating reserve, or used to reduce debt or user charges' (UK Dept. of the Environment, 2000).*

So the company is not driven by profits, but the results are the same as for profit orientated companies- costs are minimised and efficiency is paramount. The composition of the board in the NavCanada model is not significant because a similar model is being used by the 'Airline' conglomerate in the bidding process for the NATS operations in Britain. That group consists of some of the largest airlines in Europe and the IAA, but the other groups on the NavCanada board are not represented. Clearly the model is a viable one, even when firms could opt for creating for-profit companies. Of course the reason such a model is beneficial to the airline group is that any commercial returns can be fed into reducing charges, which will filter through to the same airlines as lower costs. The benefit to the IAA is

largely strategic, as it would position the company well for the consolidation that is on the horizon for the industry. The IAA will also benefit commercially from contracting its expertise to the ATC centres in Britain. Therefore, whether the private monopolist is aiming to maximise profits or to minimise charges to customers, the result is a more efficient service for everyone. Greater efficiency is one of the great advantages of privatisation, as is greater access to capital and improved safety. It is to the issue of safety that I now turn my attention.

One of the fears often voiced in certain sections of the media when the government privatises industries formerly under its control is that in the rush for profits, corners are cut and safety is compromised. This has been the catch-cry of the left wing press in Britain since the government there announced plans for the privatisation of NATS in mid 1998. However it is a claim strenuously denied by Mr. McDonnell. In this industry, he argues *"safety is not taken for granted, rather it is a given"*[6].

This statement underlines how fundamental safety is to the industry. Safety is the bedrock upon which companies build efficient, profitable businesses. Without the highest safety standards, demand for air travel would dry up, leaving the private ATC provider either bankrupt or out of a contract. The reason such issues don't arise is simply because the importance of safety is never overlooked. This is as true, if not more so, for private companies as it is for those run by the government. Where breaches of best safety practice are unearthed, the safety regulator should step in and enforce the safety guidelines that are in place. We can say with the greatest degree of certainty that such a safety regulator would be established by the government in the event of privatisation so there is no fear of falling safety standards due to privatisation.

In fact another characteristic of commercial companies would suggest that safety would be enhanced if privatisation were to be undertaken. Private companies have a much greater incentive than government bodies to perform efficiently and to a consistently high standard. To this end, a culture of accountability exists in private firms, where it is absent from the civil service. There is no clear delineation of responsibility when a quasi-independent semi-State agency (such as the IAA) has to report to a government minister and his or her department. Private companies, on the other hand, have clear hierarchies with a more structured delegation of duties, allowing errors to be rectified and the cause (be it human or machinated) identified.

[6] From a recent interview conducted by the author

The technological leaps that have been a defining feature of the industry in recent times are set to speed up. When put in the context of continued growth in air traffic, estimated by the Air Transport Association at 5.3% per year in Western Europe between 1999 and 2003 (CSFB & the UK Dept. of the Environment, Transport and the Regions, 2000), it is clear that large amounts of investment will be needed in the coming years:

> *"Capacity must increase both within the upper and lower airspace, and at airports in order to keep up with demand. This will require significant investment if existing safety levels are to be maintained" (Ibid).*

In such a business environment it is important that the board of the ATC provider should have funds for capital investment readily available to it, so as to advance the safety, service level and strategic position of the firm as and when needed. Presently, the IAA is constrained in its ability to act in such circumstances. Any proposal by the board that involves capital expenditure of more than £3.5m requires the approval of the Minister of the Environment, Transport and the Regions and the Minister of Finance. Mr. McDonnell estimates that this triples the length of time it takes to get approval for such expenditure in comparison to the time needed by private companies. It also means that the ministers, who can boast a far inferior knowledge of the industry than the board of the IAA, can in theory refuse to allow such spending, despite the fact that the IAA is self-funding. This is clearly ludicrous. Our ATC provider should have access to adequate private capital without government constraints to ensure the safety of air travellers and prosperity for the company. This will only be achieved through breaking the ties to the government and privatising the company.

Improving efficiency would not just help maintain safety in the skies, or the company's margins, it would also improve the service provided to customers. ATC caused delays have a huge impact on the costs of airlines, and hence on the traveller. This is caused by the reduction in the efficient utilisation of aircraft, higher fuel costs and increased labour costs associated with such delays. The problem was identified in the late 1980's:

> *"In total, 150,000 hours of flying time was lost through delays in 1988...and some 70% of these delays were caused by shortcomings in air traffic control. The total cost penalty*

is put at £4.19bn." (Egan, 1989)

The problem has been exasperated in the 1990's by the proliferation of flights due to the deregulation of the airline industry. The problem has also been worsened by the inability of government run ATC providers to treat airlines as customers, not surprising due to the lack of commercial incentives for them. However private companies, by tailoring their service to the needs of their customers, can help minimise delays and provide an efficient service.

The next decade promises to be an exciting time for European ATC providers. The EU has developed a "single sky" policy to integrate European ATC services so as to boost safety and efficiency. As the market consolidates, only the most efficient providers will survive, and subsequently thrive. Despite its small size, Ireland's ATC provider is strategically placed at the gateway between Europe and the US. It is also highly respected. However this is not enough. In order to capitalise on this competitive advantage, the company needs to split, allowing ATC services to be run by the most efficient private company that bids. This will boost efficiency, streamline decision making and open channels of capital investment presently closed to the IAA. The emphasis on safety should not and will not wane. If allowed to privatise, the company could find itself as one of the standard bearers of 21st Century ATC provision, if not, it will be drowned in a wave of consolidation and will become a relic of the past.

Bibliography

Demsetz, H. "Why Regulate Utilities?" *The Journal of Law and Economics.* Chicago: University of Chicago Law School.

Egan, A. (1989) *Europe: The Overcrowded Sky: Solving Europe's Air Congestion Problems.* Surrey: University of Surrey.

Great Britain. (1998) Department of the Environment, Transport and the Regions. *A Public Private Partnership for National Air Traffic Services Ltd.* London: HMSO.

Great Britain. (1999) Department of the Environment, Transport and the Regions. *A Public Private Partnership for National Air Traffic Services Ltd.: A Report on the Response to the Public Consultation.* London: HMSO.

Great Britain. (2000) Department of the Environment, Transport and the Regions. *The Government's Response to the Environment, Transport and Regional Affairs Committee's Report: The Proposed Public-Private Partnership for the National Air Traffic Services Limited*, London: HMSO.

Credit Suisse First Boston & the Department of the Environment, Transport and the Regions. (2000) *Public Private Partnership for National Air Traffic Services Limited.* Dublin: Stationary Office.

Irish Aviation Authority. *Annual Report 1999.* Dublin: Stationary Office.

In addition to my written research, I was very fortunate to have had the opportunity to interview at length Mr. Brian McDonnell and Mr. Philip Hughes of the Irish Aviation Authority and I am very grateful for their time. Despite repeated attempts to contact appropriate officials in the Department, I was unable to arrange an interview with any Department official.

The Deregulation and the Dublin Taxi Industry

Mark Murnane & Wendy Pender – Senior Sophister

The deregulation of the taxi industry seems to have divided the public. What does economics say about it? Mark Murnane and Wendy Pender provide an in-depth analysis of the deregulation, including what has happened so far, whether fares and quality should be de regulated, the role of hackneys and the issue of wheelchair accessibility. They conclude that what has been done so far is the minimum necessary to ensure a reasonable supply of taxis.

Introduction

> *A contestable market is one in which entry is absolutely free and exit is absolutely costless...In short it is a requirement of contestability that there be no cost discrimination against entrants.*[1]

W.J. Baumol has written extensively about contestable markets. His view of contestability did not apply to the Dublin Taxi market under regulation. This is because there were a limited number of taxi plates in the city and these had acquired a scarcity value of up to IR£90,000. These licences were only just pieces of paper and there was no reason for them to be worth such large sums. This situation occurred because there were very high barriers to entry in the industry. As there were only a limited number of licences entry was not free and costless. Since the market has now been deregulated there is no longer a cost discrimination against new entrants so the industry is more aligned with Baumol's theory. This should be the case as Barrett points out

> *Taxis should also compete. The capital requirements at entry level are very low, making it a perfectly contestable industry.*[2]

In this paper we outline the Dublin taxi market from regulation to deregulation and we attempt to examine whether deregulation has had a positive effect on the

[1] W.J. Baumol, (AER 1982)

[2] Barrett, S.D. Sunday Independent 15/10/2000

industry. We undertook a survey of passenger and taxi waiting times and we discuss the results in relation to The Oscar Faber Report of 1998. We also look at several alternative ways deregulation could have occurred as opposed to the way the Irish Government implemented the policy.

AN OVERVIEW OF THE INDUSTRY FROM REGULATION TO DEREGULATION

The emergence of the Irish taxi industry dates back to 1961. Part 7 of the Road Traffic Act enables the Minister for the Environment to licence Public Service Vehicles (PSV's), PSV drivers, establishes the taximeter areas and a maximum fare structure. Previously there had been an absence of a statutory body concerned with taxi issues. Quality issues tended to be the most important issue arising from the absence of a state body. In light of today's discussion, this continues to be of vital importance. We will discuss this later on.

Until 1970 there was no substantial growth in the number of taxis corresponding to a stagnant increase in demand. During the 1970's, however, demand increased and so too did the number of taxis on the road. In 1978 Statutory Instrument 298 was introduced and the market was regulated due to fears of excess supply, which it was believed would result in a fall in quality standards. Strict entry controls were put into place. Baumol (1982) states

> *Any proposed regulatory barrier to entry must start off with a heavy presumption against its adoption*

As these strict entry controls were being enforced, the Baumol's contestable market theory did not apply as entry was no longer free and costless. Entry was regulated and licences were expensive and scarce.

There was an increase of 275 taxis for the 5-year period of 1970-1975. From the time of regulation (1978) there had been a marginal growth of just 300 plates. The increase in the taxi using population over this period was 65% with only an 18% increase in the supply of taxi licences (Fingelton et al, 1997).

November 21st 2000 saw the introduction of deregulation of entry into the industry for the first time in 22 years. The industry under regulation that aimed for 'gradual liberalisation' in the number of taxi licences had failed and there was an ever-present shortage of taxis on the streets. There has been considerable debate following this action. To date there are approximately 2200 new taxi drivers on the

road.

THE ORIGINS OF DEREGULATION

On the 6th of January 2000, Junior Progressive Democrat Minister for the Environment, Mr. Robert Molloy, introduced plans to issue 3,100 new taxi plates. This plan to increase the supply of taxis was initiated due to a constant shortage of taxis in Ireland and would ultimately lead to deregulation.

His announcement was met with favour from the general public but with huge unfavour from taximen, who preferred a 'phased introduction of the plates' (Fingelton et al, 1997). However previous attempts at this had been met with contempt and feverishly contested by the latter group. The taximen claimed that the release of the plates would mean their 'financial ruin'.

The Minister's initial plan was the introduction of 3,100 new licences of which 2,600 were to be offered to existing licence holders. This action was to be taken in order to compensate existing plate holders for the "devaluation" of their licences. Although their plates may have devalued, we believe that their income would not have. A second plate would have made the market more competitive but the taxi industry was still controlled by 2,600 current licence holders. In both the John Fingleton and Oscar Faber reports it is observed that there would be enough work for an extra 4,200 taxis. (The Faber report favoured a phased introduction of licences though).

Despite opposition from the taxi lobby the plan went ahead. By the end of February 2000, 2600 licence holders applied for a second plate at an administration cost of £2,500 and £250 for a wheelchair accessible licence. The latter were so cheaply priced in an attempt to increase the wheelchair accessible service (see section on wheelchair accessible taxis).

A second group in disagreement with Mr. Molloy's proposal were the hackney drivers but for different reasons. Their claim was that the Government had exceeded their power in making such regulations and in doing so had discriminated against hackney drivers –(by not allowing them to ply for trade on the streets or to drive in bus lanes). They also argued that the new licences would go mainly to existing taxi-drivers, hence allowing them to strengthen their "cosy cartel". Their case was brought before the High Court on February 8th. They called for the whole

system to be deregulated and pending this decision they successfully negotiated a freeze on the release of the 3,100 plates. In their action against the State, Dublin Corporation and Dundalk Urban District Council the hackney drivers sought to eliminate prohibitions on the granting of taxi licences in the future. On 14th October Mr Justice Murphy ruled that the Government had in fact no power to limit the number of taxi licences. In his findings Mr Justice Murphy said that

> *A quantitative restriction not alone effects the rights of citizens to work in an industry for which they may be qualified but it also manifestly affects the rights of the public to the services of taxis, and indeed the development of the taxi industry itself.*[3]

He also stated that

> *Regulations which restrict the number of public hire vehicles contradict the very concept of public service.*[4]

This ruling put an end to the issuing of the 3,100 new plates and opened the industry to deregulation and began to align it more with Baumol's theory.

The Next Step

The Dublin Taxi Lobby had fought long and hard against deregulation and was by no means prepared to stand aside. They decided to take their case to the Supreme Court. Following the deregulation announcement, An Taoiseach outlined the terms of a settlement in response to angry taximen who saw themselves as being exempt from the rules of competition. His terms were generous:

- An individual would be able to write off any depreciation in the value of his/her licence against his/her tax liability, going back to the time of purchase.
- Drivers who paid high fees in recent years to carry disabled people would have most of their money refunded.

The scheme implied that no licence holder was directly out of pocket due to the deregulation of the trade although some individuals, who purchased plates for

[3] The Irish Times 17th Jan. 2001

[4] The Irish Times 17th Jan. 2001

large sums of money, stood to lose substantially under these compensation terms announced by the Government. There were different reasons for this: private arrangements for the purchase of taxi plates; failure to declare capital gains on the transfer of licences and the time frame being contemplated for capital write-offs – (however, submissions were possibly to be accepted in hardship cases).

The taxi men were opposed to this scheme. They threatened to seek a court injunction to prevent deregulation of the industry and if that failed they aimed to seek alternative compensation for the inevitable fall in value of their licences. Most plates have been in circulation for a very long time and have gained an artificial value because of their scarcity rather than through any particular contribution of their owners. Taxi men will argue here that it was the State who by regulating the system, created the excessive licence value but we argue that every time the Government planned to issue more plates it was met with fierce opposition by taximen resulting in the withdrawal of the plans, e.g. in Dublin as far back as the 70's, Environment Minister Jimmy Tully was 'persuaded' by a blockade on Butt Bridge to ban new entrants.[5] The blockade and strike in the run up to the Christmas period did nothing to persuade Mr. Molloy to back down. This time their 'bully boy tactics' were not to be met with public sympathy and to date we have seen the introduction of a much needed 2,200 new plates on the road.

EXAMPLES OF INTERNATIONAL DEREGULATION AND THEIR RESULTS

New Zealand

In 1989 both entry and fare deregulation occurred. Prior to this the demand for licences hugely outstripped supply due to tough regulations. Like the USA and Dublin, licences were traded for vast sums of money, again illustrating the opportunity for monopoly profits to be earned. The cost of a plate before deregulation was NZ$25,000 - (IR£10,000 approximately.). The cost of a plate in Dublin prior to deregulation was IR£80,000 - IR£90,000 approximately. In the case of New Zealand there was no compensation offered and like the Dublin experience there was huge opposition from taxi drivers. The opening up of the market meant that licences lost their scarcity values. The system of deregulation New Zealand undertook is not similar to that of Dublin although there are lessons to be learned. The argument against deregulation based on a fall in quality standards is not a valid

[5] Barrett, S.D. Sunday Independent 15/10/2000

one in the case of New Zealand. According to both the Fingleton (1997) and Faber (1998) reports the New Zealand case was a success because their quality standards actually improved post deregulation by introducing measures on proper person criteria, area knowledge tests and vehicle standards. Many taxi firms also merged together enabling them to achieve economies of scale.

Sweden

This is another example of a country which has experienced full deregulation. Barriers to entry were removed and more stringent checks were made on applicants to ensure high quality levels for example trade skills and economic suitability of potential applicants. Fares increased post deregulation. The Government brought in measures, which introduced the issuing of receipts. In the Dublin case we think the issuing of receipts may be significant and there should be a call for it. Here are our reasons:

1. The issuing of receipts would aid the Revenue Commissioner when/if tax write-offs come into play for the purpose of compensation.
2. The issuing of receipts would indicate if and to what extent taxi driver's incomes will change post deregulation. If the market does become saturated and incomes fall there would thus be evidence to substantiate this.

U.K.

The Transport Act of 1985 allowed partial deregulation of entry into the market. An applicant could now only be refused entry if there was insufficient demand in the market to merit an increase. Myles O'Reilly, in his affidavit to the High Court[6], favours this type of procedure and discusses Queensland as an example.[7] In the case of the U.K. there was a substantial increase in the number of taxis. In areas where only partial deregulation was imposed there was a huge rise in the number of hackneys. This reflects the situation in Dublin where there was only 2,700 licenses but a fleet of 4,500 hackney cabs. O'Reilly argues here that it was likely in time that hackneys could have met the demand for a significant proportion of taxi work if no additional taxi licences were issued.

[6] Affidavit of Myles O'Reilly to The High Court (2000)

[7] In this example a survey of waiting times was taken. If waiting time was on average above a certain level, then The Chief Minister of Queensland was required to issue new licences. These were then auctioned.

Toner (1996) does note that council areas with full deregulation did not increase rank space, leading to some overcrowding which may have led to an entry restriction being placed back in that area. This argument is similar to one made by Irish taxi drivers that the Government have failed to make extra space available on ranks. We do not believe this argument is valid because over the course of our survey – (results outlined in full later) - the most taxis at the rank at once was 5 and there is room for 7. This shows that at both peak and off-peak times there seemed to be enough room at the rank surveyed which we feel is representative of Dublin as a whole.

DUBLIN TAXI FARES, STAY REGULATED OR DEREGULATE?

Currently in Dublin taxi fares are regulated. Fares were last changed in 1998 following the Oscar Faber report. Hackney fares on the other hand are not regulated. Most hackney operators seem to base their fare structure on those of the taxi market. Hackneys would have difficulty in raising their fares above those set in the taxi industry without losing substantial market share. Consumers have a greater chance to bargain with the hackney operator because the cab is ordered over the phone and not at a rank or on the street. One would therefore believe that hackney fares should not be altered as they are aligned with those in the taxi market.

When taxi fares have been deregulated in other countries, prices have fallen in some cases. This can be seen to be because the previous fares were excessive and large monopoly profits were being earned. With deregulation new entrants lowered fares causing those in the market to lower also. Baumol (1982) maintains that

> *A contestable market never offers more than a normal rate of profit – its economic profits must be zero or negative.*

We consider that fares in the Dublin market should continue to be regulated. Some economists believe that prices should be different at peak and off peak times. This is because they think that supply will increase at peak times if a higher price is charged. This we feel could cause confusion amongst consumers and leaves the door open for some taxi operators to charge the higher price at both peak and off-peak times to people who are not well informed such as foreigners, infrequent users, etc.

DUBLIN TAXI QUALITY, DEREGULATE OR STAY REGULATED?

There are quality standards for both drivers and vehicles. Taxi vehicles must be approved both in terms of size and seat capacity and in terms of safety and roadworthiness. The Carriage Office is in charge of this. To obtain a PSV licence an applicant must take a once off test of driving skills and a test of knowledge of the city. The applicant must also demonstrate that they are a fit and proper person.

While deregulation occurred in the industry, quality must be kept at a high level. Consumers are not aware of whether the taxi they are travelling in is of high quality or not. Increasing levels of random inspections on the taxi fleet must address this, especially now that numbers have increased. With the issuing of new licences the quality of the fleet may improve somewhat as new licence holders may purchase new vehicles.

THE DUBLIN HACKNEY INDUSTRY

Demand in this sector also outweighs supply. There are three main problems cited by hackney drivers:

- Shortage of drivers especially since the deregulation of the taxi industry. Many potential and existing drivers have opted for taxi licences.
- Traffic congestion in Dublin.
- The exclusion of hackney cabs from bus lanes and on street hiring.

We believe that hackney cabs should be allowed to travel in bus lanes whilst occupied by a fare due to the existing low volume of traffic in these lanes. We are aware that for this to occur there needs to be some kind of identification to distinguish a hackney cab from ordinary cars making illegal use of bus lanes.

Hackneys in general are 'restricted in the manner in which they provide hire and reward services, in particular by being prevented from plying for or standing for hire in public places and in effecting contracts for hire by means of telephones or radio communications with the vehicle in a public place'.[8] However,

[8] The Irish Times 11th Jan. 2001

now with deregulation of taxis we feel these stipulations should remain and in fact the Oscar Faber report calls for a single taxi licence and the elimination of two separate categories of PSV's. Hackneys are not subject to a maximum fare structure and in fact charge by mileage. As we have already discussed, fares are similar to and based on taxi fares. Hackney cabs are also unable to display a distinguishing sign on the exterior of the vehicle, which relates to the problem of being able to drive in the bus lanes. Hackney licences are currently non-transferable.

Both hackney and taxi drivers are subject to quality conditions that seek to ensure that they are fit and proper persons and have knowledge of the area in which they intend to operate. Vehicles have to comply with general vehicle safety requirements and meet a number of conditions specific to PSV's.

The distinction between taxis and hackneys reflects a view that there are 2 separate markets for small PSV: the demand market, which is supplied by taxis and secondly the pre-booked market, which is largely supplied by hackneys. Both are in short supply. However the taxi situation has now been remedied somewhat.

The initial increase in the number of hackneys was due to the continual shortage of taxis. With taxi ranks at night and at peak times clearing at a snails pace, businesses and individuals turned to hackneys.

A study carried out on December 15th in relation to Pony Cabs, one of Dublin's biggest hackney companies, indicated that of 6,320 calls received, just 2,718 were answered and only 1,110 of the callers fewer than 18%, actually got cars. [9] Although this sample was taken at a busy Christmas period it still showed the lack of hackneys available for hire. The problem here is not licence restrictions but a shortage of drivers. As with taxis there were no limitations placed on the number of hackneys allowed to operate during the period and up to 1978. Compared with the issuing of taxi licences, a more liberal policy has been followed regarding hackneys. Restrictions on entry to the hackney trade have taken the form of moratoria on the issue of new licenses, which have been applied from time to time. However, the relative ease of access compared to the taxi industry is evidenced in the rapid increase in licences in the 1990's and particularly during 1996. The number of

[9] The Irish Times 11th Jan. 2001

current hackney licences is in excess of 4,500, although this number will be due to fall as many hackney licensees have applied for or have already received one of the new taxi licences.

STRUCTURE AND MODE OF OPERATION OF THE HACKNEY INDUSTRY

As hackney licences have been more freely available and are not transferable they do not command a high price on the open market. Most hackneys are affiliated to a hackney company, which takes and allocates bookings. There are approximately 70 such companies operating in the Dublin area. The hackney trade is free to set fares by negotiation with the customer. Hackneys now account for 65% of cabs on the road. While it is still too early to draw conclusive results it is predicted that post deregulation hackney numbers will actually decrease significantly. This can be seen to be based on:

- There being no entry restrictions to a highly demanded taxi industry.
- Existing hackney drivers ability to obtain a taxi licence with relative ease.

Growth in the number of hackneys reflects a rising demand for cabs, which taxis could not cater for because of restrictions on the number of licences issued. Demand according to Fingleton (1997) was due to:

- The increase in population
- The increase in tourism
- The increase in economic growth.
- Increases in laws of drink driving. The government enforced these rules but failed to provide an increase in transport to get home.

WHEELCHAIR ACCESSIBLE TAXIS IN DUBLIN, SHOULD THE NUMBERS BE INCREASED?

Taxis are very important for people with disabilities as they provide a door-to-door service. Unfortunately the number of wheelchair taxis is still quite small and thus waiting times can be excessively long for those with a need for one. The Faber Report gives the following example; a taxi man with a wheelchair accessible vehicle that is busy in the city centre is unlikely to respond to a telephone call out to pick up a disabled person in the suburbs as it involves a loss of earnings due to the taxi being empty whilst travelling to and from this fare. This example shows the difficulty involved for a person with a disability in trying to order a taxi. Fingleton et al (1997)

call this process 'cream skimming', i.e. choosing more economic hiring's.

Many experts believe that all taxis should be wheelchair accessible. Any new licences issued should possibly have been in respect of wheelchair accessible vehicles. There is an additional cost involved in this side of the business as wheelchair accessible vehicles are more expensive than normal saloon type vehicles and the trade-in-value is less. This can be overcome by the extra business that these owners can take on that non-accessible vehicles cannot. Another method used to encourage new applicants to take a wheelchair accessible licence is to give a subsidy as an incentive or price the licence at a lower level than normal vehicles. The Irish Government priced at £250 as an incentive to encourage growth in this sector. However we have failed to see a massive growth in numbers and it is estimated that out of the approximate 2,200 new cabs just 100 are wheelchair accessible. It is worthwhile noting that by 2003, under EU regulations, all taxis are supposed to be wheelchair accessible. This is unlikely to occur in Ireland due to the massive cost involved in this changeover. There was a call for all the new licences issued to be for wheelchair accessible taxis, which would have increased the chances of meeting these future EU regulations in time.

Is Taxi-Sharing Viable in Dublin and Should it be Reemployed?

The policy of taxi sharing was introduced in Dublin for a short period in 1999-2000. This scheme can be seen as a success in West Belfast, North Belfast and Derry. The drawback of taxi sharing is that there are only limited conditions under which the scheme can work. There must be sufficient demand for the service in order to lower waiting times. If there is insufficient demand there will not be people to share with. On the other hand demand cannot be excessively large so as to necessitate the use of minibuses. Drivers will not take on the scheme unless fares equal to a number of exclusive hiring's are made for each trip.

There can be seen to be non-price advantages of taxi sharing. From their study of the Northern taxi-sharing scheme, Barrett and McLoughlin (1984) state that there are non-price advantages to this policy. These are as follows:

- Greater frequency
- Longer hours of operation
- Shorter journey times than those of buses
- Provision of a door to door service

The Northern study found that the service operates from a designated terminus in the city centre and members are required to leave the terminus after 10 minutes so as to ensure frequency. The taxi service was found to be more frequent than the Ulster bus service. Journey times by taxi were reduced by up to 50% of those of buses because of avoidance of congested areas, most people also found that taxi drivers were more helpful and courteous than bus drivers and that the taxi share service was safer, cleaner and more comfortable than the bus service.

On the other hand the experiences in the UK suggest that taxi sharing has not been as successful as in the North. The Oscar Faber Report believes that this is because of a

- Lack of supply of taxis at peak times.
- Lack of demand for services offered.
- Lack of professionalism in the planning and marketing of the scheme.

Many believe that the establishment of a permanent taxi-sharing scheme for Dublin is viable under deregulation. They believe that there would be sufficient demand for such a service as there are large numbers who travel both to and from bus and train stations daily and to and from the airport. The Faber Report proposed that taxi-sharing ranks be at Foster Place on Dame Street where it was previously and at Dublin Airport. It may be that other ranks would have taxi-sharing positions over time if the system worked well.

Dublin taxi sharing seemed to be quite a success around Christmas time in an effort to reduce long queues. Those willing to share formed a queue at three city centre ranks to facilitate arrangements for taxi sharing. Marshalls employed by the Corporation matched passengers to cars with the city divided into eight zones, each with three price levels covering a nine mile radius.

We believe that the system of taxi sharing is no longer applicable in Dublin under full entry deregulation. We say this because there should be enough taxis to cater for demand even at peak times as illustrated in the results of our survey of passenger and taxi waiting times.

A Survey of Taxi and Passenger Waiting Times After Deregulation

We undertook a study of the effects of current deregulation on the taxi

service in Dublin on Wednesday January 31st 2001. We conducted the study at three separate times during the day at the Dame Street/College Green rank as we felt it was representative of a busy city centre area. We undertook the study to examine the effects of deregulation to date and to determine if the extra 2,200 or more taxis on the streets were having positive effect.

Our first study was carried out at 10:15 -11:15 an off-peak time. The results were as follows:

- Out of 50 pick–ups just 3 passengers were waiting at the rank for a taxi to arrive and each of these passengers was waiting on average for just one minute.
- The average wait of a taxi for a passenger was 3.22 minutes, with 8 taxis waiting for zero minutes, i.e. no wait, and 2 taxis waiting the maximum time of 9 minutes.

We noted that at certain times the rank was very busy i.e. 10:25 – 10:35, yet at other times there was an absence of both passengers and taxis i.e. 10:15 – 10:20. Taxi congestion at this time was not significant and we were satisfied that at this time demand and supply were met effectively.

Our second study was performed during the peak hour 16:45 – 17:45. We found this time that on average it was passengers who were left waiting on taxis.

- The average passenger waiting time was 2.51 minutes with a maximum of 10 minutes.
- The most people waiting at the rank at any one time –(17:15)- was 13 people. However the queue moved at a quick pace.

The busiest period was from 17:15 – 17:30 where passengers were waiting between 7 – 10 minutes. During this hour 71 fares were picked up, an increase of 21 from the off-peak hour. We also noted that at this time that the level of traffic congestion was high (and several taxi men were at pains to point this out). This may go towards explaining why some passengers were waiting for up to 10 minutes at the rank.

Our final study was undertaken between 2:10am and 3:10am. In our opinion this again represented a peak time. On this occasion we observed that taxis were waiting on passengers. The average taxi waiting time was 2.54 minutes. When

we joined the queue at 3:30am, we had a wait of 9 minutes as did the other 12 people in the queue. This made us realize that this time may not have been representative of a peak time.

As we believe our findings are representative for the city centre as a whole, one could say that deregulation has had a positive effect. Passenger waiting times never exceeded 10 minutes during peak times as opposed to an astonishing 90 minute waiting time outlined in the Oscar Faber report. The report also observed that taxis had to wait for long periods during the day waiting for passengers. This was not the case in our survey. We found that taxis waited no longer than 3.22 minutes. Perhaps the 3year lag explains the difference in results. Another reason may be due to Ireland's economic boom, disposable income has increased and many people have more money to spend thus meaning that more people may be inclined to use taxis at off-peak times. Overall we feel that it is possible to say that deregulation is having a positive effect.

Conclusion

We consider that the entry deregulation of the Dublin Taxi industry has been quite successful so far. Supply is coming closer to meeting demand but they are likely to never fully meet because there will always be people waiting for taxis while empty taxis drive around elsewhere. This is just the nature of the market. On the other hand we believe that fare deregulation should not occur and we would suggest that price controls stay in place for the time being. Overall then we feel that the Dublin Taxi industry has moved towards being a more contestable market. All in all though, service has improved and we must commend Minister Molloy and the Government on a job well done.

Bibliography

Baumol, W.J. (1982), *Contestable Markets: An Uprising in The Theory of Industry Structure*. London; New York: Harcourt Brace Jovanovich.

Baumol W.J., Panzar J.C. & Willig R.D. (1983), ***Contestable Markets: An** Uprising in The Theory Of Industry Structure. A Reply.* London; New York: Harcourt Brace Jovanovich.

Barrett, S.D. (1982), *Transport Policy In Ireland.* Irish Management Institute. Dublin.

Barrett, S.D. (1991), *Transport Policy in Ireland in The 1990's.*Dublin: Gill & Macmillan.

Barrett, S.D., & McLoughlin, D. (1984), *Taxi Sharing: Belfast Leeds London.* (Economic Affairs Dec. 1984).

Dublin Taxi Forum – John Mahony (1998): *Recommendations.* Department of An Taoiseach.

Fingleton J, Evans J, & Hogan O. (1997), *The Dublin Taxi Market: Re-Regulate or Stay Queuing?* TCD Department of Economics.

Hyland Associates (1976), *Study of Taxi and Hackney Services.* The Stationary Office Dublin.

Oscar Faber TPA / Goodbody Economic Consultants (1998), *Review of The Taxi and Hackney Carriage Service in The Dublin Area: Final Report June 1998.* Oscar Faber.

Affidavit of Mr. Myles O'Reilly to The High Court (2000)

Irish Times Archives. www.ireland.com/newspaper/archive

Irish Independent Archives. www.unison.ie/irish_independent/archived.php3

The Economist. www.economist.com

An Economic Critique of the LUAS Project

Andreas McGrath and Katie Mooney – Senior Sophister

Given Dublin's notorious traffic congestion it seems logical to welcome the coming of the LUAS light rail system. Andreas McGrath and Katie Mooney, however, warn us not to accept it without reservation. They question the projected benefits, both environmental and time saved, but ultimately concede that economic concerns may have to yield to political will.

Introduction

The LUAS light rail system was born out of the Dublin Transport Initiative (DTI). It will cost £137m at 1998 prices (excluding preliminary study costs) and is discounted at a rate of 5%. This is a new approach to transport planning in the Dublin area, and is 75% funded by the E.U. The committee, appointed by the minister of the Environment, and called the "Dublin Transportation Review Group", has representatives from Local Authorities and CIE. This group has recommended the expansion of all existing modes of transport, with emphasis on public transport, and the introduction of a light rail system, which can be run on or off the road. We find that the evidence gathered to date is at odds with the broad aims of the DTI, and also with the overall objectives of the Dublin Transport Policy.

> *'The elements of the work carried out by the DTO [Dublin Transport Office] were:*
> - *Selection of the most appropriate public transport modes (Bus, QBC, DART, LUAS or Metro) for each part of the conceptual network, based on the passenger flows.*
> - *Development of a set of viable transport strategies for Dublin in 2016, informed by strategic studies of the suburban rail network, the bus network, the eastern bypass and the national road network'* (Dublin Transportation Office, 2000).

We have decided to review the LUAS under the following headings:

1. Economic Value Added
2. Environmental Impact Analysis
3. Capacity Issues
4. Light Rail Transit (LRT) versus Bus (QBC)
5. Conclusion

We have decided to concentrate our analysis on Line A, in order to compare like with like (tables and data) and to avoid confusing juxtapositions of figures gathered from various sources. To this end however, it must be noted that the same transport model was applied to Line B. Line C has also been left out as it consists of 100 metres or so, which joins Store Street (Line A terminus) with Connolly Station (Amiens Street). This is to try to integrate heavy rail and light rail more cohesively, and so does not take into consideration any population's transport requirements. This line at one time was envisaged as a "travelator" line (moving floor, as in airports). *"The Inquiry does not recommend the termination of the line [A] at Store Street...The Light Rail System would be considerably enhanced by the integration of the system with the transport hub that is Connolly Station" (Department of Public Enterprise, 2000).*

Economic Value Added

Several reports were produced between the years 1994 – 1998 on behalf of the government and at great cost. These were carried out by a transportation Consultancy; Steer Davies Gleave with specialist input from McHugh Consultants (Land Use Issues). Their reports were produced in phases or technical reports encompassing all of the areas we have decided to review.

Steer Davies Gleave published a lengthy Cost Benefit Analysis (Steer Davies Gleave, 1998) of the LUAS Light Rail System. Both the Financial and Economic Evaluation assumed that:

- The scheme opens on 1st January 2003
- The evaluation period is 30 years
- The discount rate is 5%

This is a Government benchmark rate, used to evaluate large public projects.

Figure 1: Financial Evaluation

	Present Value (£m)
Revenue	73
Operating Surplus	5
Capital Cost	-137
	-132

Source: Steer Davies Gleave, "LUAS Line A Cost Benefit Analysis"

From figure 1 we can see a largely negative Financial Net Present Value (NPV). From this, several points must be noted.

Inherent Capital costs do not include study costs. The revenues flowing from LUAS are dependent on the system being on time in accordance with their proposed schedule. This complexity gives rise to (among other things) a proliferation of maintenance and supply contracts, which are very specialised. (The millennium dome had 2700 subcontractors!)

Many of these contracts escape proper accountancy procedures and it is a growing problem. That is, they are in effect medium and long term charges on the operation which are not shown on the balance sheet, but over time they may crop up on the profit and loss account.... mostly as losses! Couple that with the need for esoteric skills and job descriptions many of which are being invented as we speak and you have a recipe for disaster.

Outlined in Figure 2 are the Economic Net Present Values (NPV) evaluated at several discount rates compared with the Government benchmark used in the original CBA.

Figure 2: Sensitivity Analysis

	PV @ 5%	*PV @ 10%*	*PV @ 11.5%*	*PV @ 13%*
User Time Savings	506	308.5	273.0	244.0
Non-user Time Savings (Cars)	-81	-49.4	-43.7	-39.1
Non-user Time Savings (HGV's)	11	6.7	5.9	5.3
Vehicle Operating Cost Savings	11	6.7	5.9	5.3
Accident Savings	2	1.2	1.1	1.0
Total Benefits	**450**	**273.7**	**242.2**	**216.5**
Operating Costs	-68	-41.5	-36.7	-32.8
Capital Costs	-137	-83.5	-73.9	-66.1
Total Costs	**-205**	**-125.0**	**-110.6**	**-98.9**
Economic NPV	**245**	**148.8**	**131.6**	**117.7**

We see that the Economic NPV is almost halved using a more realistic and applicable discount rate. The comparative discount rates were chosen for their application in other international Light Rail Systems [*Croydon = 10%, Docklands Light Railway = 11.5%, Manchester = 13%* (Morgan, S. Health and Safety

Manager; Light Rail Project Office)].

The internal rate of return is unchanged at 11.7% as the revenue streams were left unchanged from the original CBA.

The subjective nature of Cost Benefit Analysis (CBA) has often led to uneconomical projects in the past. The Community Support Framework (CSF) Evaluation Unit has published general problems arising from CBA (CSF, 1999). They have found a lack of consistency in the main parameters used and a tendency towards undue optimism in the estimation of Socio-economic benefits. Specific weaknesses included are:

1. *Unrealistically low shadow wage rates*
2. *Lack of clarity in identification of the counter factual*
3. *Use of base line scenarios of doubtful plausibility*
4. *Problems with the treatment of taxation*
5. *The choice discount rate*

SOURCE: PROPOSED WORKING RULES FOR COST BENEFIT ANALYSIS, CSF EVALUATION UNIT JUNE 1999

They noted also,

> *the studies are generally commissioned by the sponsoring department or agency and that a political decision to undertake the project has often been taken in advanced of the CBA* (*Ibid.*)

We find that many of these shortcomings are applicable to the LUAS Cost Benefit Analysis. In particular, the *Lack of clarity in identification of the counter factual* is evident in the absence of comparison between the LUAS and the Bus in terms of like-with-like comparison. Many tables in the Steer Davies Gleave studies compare economic NPV of the LUAS with that of the DART. However, although the issue of comparison with Bus is pertained to, explicit data is not readily presented. The *use of base line scenarios of doubtful plausibility* is inherent as the main thrust of the LUAS is to attract car users into the public transport system thus alleviating the traffic congestion.

Demand Management... is designed to encourage a transfer of trips, especially at peak periods, from the private car to sustainable modes of transport such as public transport (Dublin Transportation Office, 2000).

However as shown in the Steer Davies Gleave report, time savings are a meagre 3 minutes (Steer Davies Gleave, 1993). *The choice discount rate* as we have pointed out is unusual in public projects of this capacity.

Capacity Issues

The Public Relations supplement published in the Irish Independent (Saturday, 14th January 2001) has raised several questions in relation to the capacity capabilities of the provisional timetable. The supplement boasts that I tram can carry as many as 168 cars or 235 people, and forecasts the following:

Figure 3: Forecast Demand

Forecasted Demand	*Peak Hours*	*Off-Peak Hours*
Number of People	>4800	>1800

Source: Steer Davies Gleave. "Cost Benefit Analysis for LUAS Line A"

Figure 4: Frequency of LUAS

Frequency	*Peak Hours*	*Off-Peak Hours*
Minutes	*5*	*12*

Source: LUAS PR supplement, Irish Independent.

A closer look at these published figures suggests that the LUAS Line A will be under capacity in 2006, just three years after being introduced. This is obviously a major problem, as its function is stated as '*To alleviate traffic congestion by providing an incentive for transferring from cars to public transport*" (DTI). The arithmetic is follows:

Peak Hours

Expected: 4800 users (Steer Davies Gleave,1998).
Capacity: (235 people per tram every 5 minutes) X (12 trams per hour) = 2820 users

Shortfall: 1980 users per hour, equivalent to an extra 8.5 LUAS trams per hour
Revised Timetable recommendation: One tram every 2.8 minutes.

Off- Peak Hours

Expected: 1800 users per hour[1]
Capacity: (235 people per tram every 12 minutes) X (5 trams per hour) = 1475 users
Shortfall: 625 users per hour, equivalent to an extra 8 LUAS trams per hour
Revised Timetable recommendation: One tram every 7.5 minutes.

There are 22 Light rail Vehicles (LRV's) currently on order, at a cost of £1.1m each. To meet the LUAS' expected peak hour demand, incorporating the Revised Timetable Recommendation (above) a further 5 LRVs would be required. This would add an extra £5.5m onto the capital costs, bringing the Financial NPV down to an altogether unacceptable -£137m.

It must be noted however, that these demand figures represent a conservative estimate. This figure is based on population projections, and does not take into consideration the phenomenon of "latent demand" which is observed on large-scale public projects (Barrett & Mooney, 1981). The reduction of car lanes and possible inner city population growth could far outstrip these expectations.

Environmental Impact Analysis

A stated main advantage of the LUAS is that it will be relatively pollution free. We are of the opinion that this is somewhat of a misnomer.

- Electricity is required to run the LRV's. This puts extra demand on fossil burning power stations.
- Electromagnetic radiation emitting from overhead wires is of indeterminate danger.
- All other externalities arising from the construction of the LUAS e.g. the rat problem. Visual pollution of unsightly wires, incongruity of modern platforms on old streets.

Some technical points need to be understood for the fair comparison of the

[1] See figure 3

LUAS to other modes of transport. Due to the lack of comparison between the LUAS and QBCs, we have examined like-with-like figures for fuel consumption between these two modes. The Equivalent Fuel Consumption (EFC) of a four-car 30-meter train carrying 190 passengers (based on 4 per m^2, each passenger has 2.69 ft^2) is 5kwh/km^2. Allowing for generation and transmission losses of 65.8%, this gives a real "fuel consumption" at the power station of 14.62kwh/km. Using diesel oil (also known as fuel oil) with an energy value of 10.8kwh/liter, as a common standard, it is thus consumed at the rate of

1.35 litres/km or
2.18 litres/mile or
0.48 gals /mile or more familiarly as
2.086 miles per gallon for LUAS

Dublin Bus has provided a provisional figure of 5.68 miles per gallon for a bus capable of carrying 88 passengers. Using the simple ratio 88/190 to adjust for passenger carrying capacity this equates to: 2.63 miles per gallon for buses of equal capacity. Moving the emission point of the products of combustion from the route of the LUAS to the atmosphere above Ringsend, makes no difference to global warming. Localised pollution is the issue in question. Diesel engines running on fuel oil produce a known spectrum of pollutants, which are undesirable, and the damaging effects of which have been costed (ibid). Engines are available producing negligible health damaging pollutants when run on light gases and hydrogen, but which still produce the equivalent CO2 burden.

Briefly, on the subject of transfer of car ownership, Steer Davies Gleave has prepared a forecast for the private car transfer on the Tallaght – Dublin route. We see a very modest car saving of 794 cars out of a total of 183,910. This equates to a saving of 0.43% on account of the introduction of the LUAS. Further to that, and given the capital cost of the system, this is a value of £86,272 placed on each car taken off the road!

[2] This figure was obtained from the Light Rail project Office engineer.

Figure 5: Modal Trips Totals – Person trips 2006 morning peak hour

	DTI strategy (with LUAS line A) Tallaght - Middle Abbey Street	*DTI Strategy No LUAS*
Car	183,116 (-794)	183,910
Bus	59,091 (-2854)	61,945
Rail/LRT	28,684 (+3597)	25,037

Source: Steer Davies Gleave. "Cost Benefit Analysis for LUAS Line A"

LRT Versus Bus (QBC)

The choice for electric power over diesel-engine vehicles is one that is at the heart of this section. A well-known fact in relation to this debate is that electric powered vehicles lose a great proportion of their efficiency in the transition between generation and application. Diesel engines however, retain up to 100% efficiency between combustion and torque.[3] Electric power indeed removes some pollution from the areas of operation (specifically, urban areas with high population concentration) but transfers the pollution from local areas to power station chimney stacks (albeit at a higher level). The Total Primary Energy Requirement (TPER) (Department of Public Enterprise,2000) is a measure of all energy consumed in Ireland, and is higher as a result of the introduction of LUAS than an alternative strategy using Diesel Buses in QBC's. Furthermore to this argument, and somewhat of an aside, advancements in catalytic converter technology has allowed internal combustion engines to run at near-silent and near-zero emissions levels for most of their operating lives.

[3] Torque is measured in Newton Meters and is a measure of force exerted on the axle of a vehicle. Generally it applies to the pulling power capabilities and holds a directly proportional relationship.

From an economic standpoint then, we can observe that a bus system has the following advantages over a LRT system:

- **Massive Cost Savings:**
  Rolling Stock - £90,000 per bus v. £1.5m per LRV
  Infrastructure – Virtually no investment required for QBC. Only minor alterations for road surface, signposting and right of way. Huge Costs facing LRT system for road alterations, track laying, station building etc.

- **Capacity Issues**
  Following from the previous section, a less capital-intensive system will mean that more capacity can be offered for the same budgetary allocation.

- **Efficiency**
  Wastages through electrical transistors, transformers and sub-stations mean that a bus-based system will use fuel inputs more efficiently than an LRV based system.

- **Flexibility**
  Guided Vehicles (requires tracks) offer less flexibility than non-guided vehicles, enabling faster and more responsive alterations to services in reaction to changes in urban sprawl and population density.

Conclusion

When a Government decides to commit to a large public project such as the LUAS, many conflicting standpoints present themselves and one would be naïve to think that economic considerations alone drives the political engine. With this in mind, it seems that Ireland is not only trying to keep up with the Jones' but the Blair's, and the Schroeder's! Image considerations play a large part in decision-making. 'Progressive and Modern' are often the buzzwords banded around the dark corridors of Leinster House when discussing how best to spend our tax euros. Reasons given for LUAS include:

> *...a bright, modern and efficient form of transport [LUAS] will be unveiled. In my opinion it will be just the start of an era when Dublin*

> *can shed its image of congestion and poor public transport to that of taking its place among other modern European capitals* (Mary O'Rourke, Minister of Public Enterprise).

From a local Authority point of view, *"at this stage, so much has been said and spent that I think 'Just build the thing"* (Owen Keegan, Director of Traffic, Dublin Corporation). From DTI's viewpoint,

> *...proud of its history and heritage [Dublin], its unique character conserved, a fit setting for Government and national centres of excellence.* (Dublin Transport Initiative, Transport Modelling Technical Volume 6, 2000).

Although these are hardly valid economic arguments, one must accept their weight in political and public circles.

From an integration point of view, a lack of cohesiveness and a reliance on Victorian train tracks means that the LUAS shall be confined to its own bespoke tracks. This will prevent full integration of the transport system (Metro, LUAS, Bus, DART) and thus will prevent the realisation of major economies of scale and scope.

Unfortunately work has already commenced on line A, so no conclusion would suffice without addressing how to optimise this compromised situation. If the DTI is to realise its startegy of transferring car users to public transport, the LUAS will only play its part if operated in conjunction with a realistic road pricing system.

We have shown conclusively that an electric system offers no major environmental benefits above and beyond a more conventional bus system. If the environmental issue is to be pursued the only recommendation is to strive for hydrogen or fuel cell vehicles in the bus sector.

Although Dail Eireann seems to be the last stop for approval of the LUAS system, the last stop shall ultimately be the commuting public's stamp of approval.

Bibliography

Barrett, S.D, & D. Mooney. (1981) *CBA for Naas Dual Carriageway.* Dublin.

CSF Evaluation Unit. (1999) *Proposed Working Rules for Cost Benefit Analysis.* Dublin: Government Publications.

Department of Public Enterprise. (2000) *A New Institutional and regulatory framework for public transport.* Dublin Stationary Office, DublinDublin Transport Initiative. *Light Rail Transit (LRT) Technical Volumes 1 – 6.* Dublin: Stationary Office, 1989 – 1994.

Dublin Transport Initiative, prepared by Steer Davies Gleave. (1998) *Cost Benefit Analysis, LUAS Line A.* Dublin: Government Publications.

Dublin Transportation Office. (2000) *Dublin Light Rail (Line C(S) – Store Street to Connolly Station) Order, 2000.* Dublin: Government Publications.

Dublin Transport Office. (2000) *A Platform for Change. Strategy 2000 – 2016.* Dublin: Dublin Stationary Office.

Irish Independent Supplement. (2001) *Dublin's State of the art Tram System – LUAS.* Dublin: Irish Independent.

Light Rail Advisory/Action Group. (2000) *Third Report of the Light Rail Advisory/Action Group, to the Minister of Public Enterprise.* Dublin: Dublin Stationary Office.