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Hyperlinks marked in this blue and underlined

*Commoditization
and the end of
Financial Scarcity
By Michael Power*

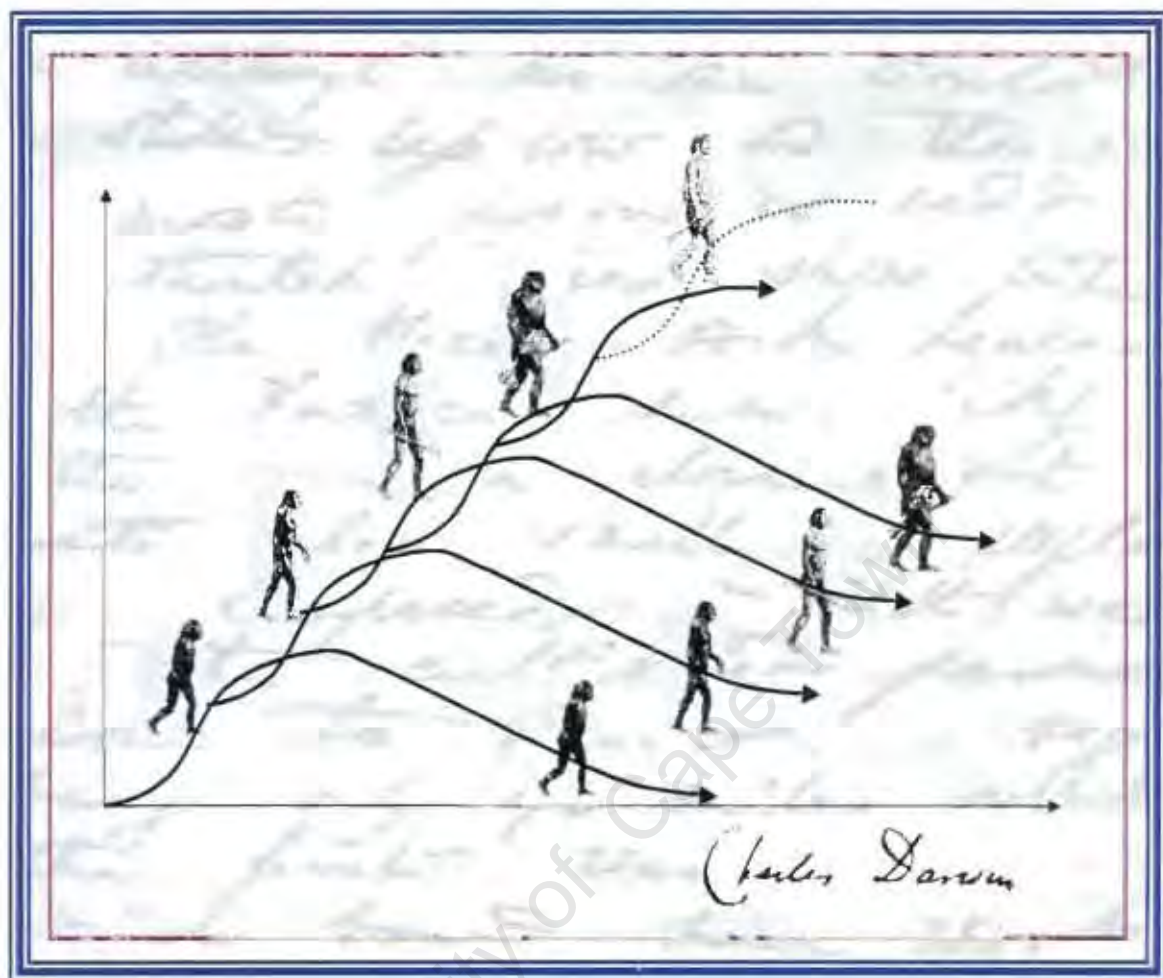
Thesis presented for the Degree of

DOCTOR OF PHILOSOPHY

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In October 1838, that is, fifteen months after I had begun my systematic inquiry, I happened to read for amusement Malthus on *Population*, and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, *and unfavourable ones to be destroyed*. The results of this would be the formation of a new species. Here, then I had at last got a theory by which to work.

*Charles Darwin, Autobiography (1876) –
Emphasis Added*

Definitions: The word '*capital*', if used alone, refers *only* to financial capital and *not* the more commonly used meaning in economics, namely '*a dynamic stock of durable structures*' (*Encyclopaedia of International Political Economy*, 1999). This reasoning is expanded upon below. Extending this preference, the word '*productivity*' is NOT used in its traditional sense in economics, which is usually in the sense that it measures the output efficiency of labour. Rather the term '*productivity*' is used to measure the output efficiency – the 'profit' – of financial capital.

Date format: Day.Month.Year

Cut-off date: This thesis seeks to make observations that are more structural than cyclical (noting however that the cycle is part of the structure) or otherwise unusual in their nature. Where leading indicators for East Asian economies are cited, they are as at June or for the second quarter of 2001, well in advance of the economic fallout emanating from the terrorist attacks on the United States on 11.9.2001.

Footnotes: Bibliographic sources and clarifications are cited at the bottom of each page. A complete alphabetical bibliography of primary sources is provided at the end of the document.

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Introduction

The Economics of Commoditization

...and the Commoditization of Economics?

Economics allowed investment banking recruiters directly to compare the academic records of recruits. The only inexplicable aspect of the process was that economic theory served almost no function in an investment bank.

So wrote Lewis of his experience of being a bond trader at Salomon Brothers on Wall Street and in the City of London¹. By implication, he was saying economic theory was no longer adding much value in the market where most of its students had expected it would constitute a valuable skills foundation. Little did those of us who went through almost a decade of demand curves expect to find that the subject, and even the object, of our dedication – economics – had become ‘commoditized’.

One would like to think Lewis was overstating his point for dramatic effect. And besides, ask any ‘proper’ investment banker who works in corporate

¹Lewis M. 1989

finance (even the *'limp wristed, overly groomed fellows on small salaries'*²), and they would have retorted *'What would Lewis, a bond trader from a debt house like Salomon, know anyway?'* One could easily dismiss such banter as professional back biting, but Lewis touched a raw nerve: Ormerod's book, *'The Death of Economics'*,³ gives this quotation prominence in the opening chapter, *'Economics in Crisis'*.

I worked in the third leg of the investment banking fraternity, fund management⁴, and arguably in its most exotic part: emerging markets. There economic theory was not only necessary to our work, it was and remains arguably the most important skill required. If one cannot get the macro country calls right, the best micro stock picking *literally* 'in the world' is unlikely to save performance. During my time at Baring Asset Management, I recall debating in earnest:

- ❖ the slopes of the asymmetric band defining the trading range of the Israeli shekel
- ❖ the advisability of Krugman's sanctioning of temporary capital controls in Malaysia
- ❖ the number of months of import cushion needed by Russia to allow it to pursue much-needed domestic reform

² Lewis M, 1989

³ Ormerod P, 1994

⁴ When it comes to name-calling, economists can give at least as good as they get. Burton Malkiel wrote of my own profession, *active* fund management, that *'A blindfolded monkey throwing darts at a newspaper's financial pages could select a portfolio that would do just as well as one carefully selected by the expert'*, (2000). Even Paul Samuelson had more tamely suggested: *'Most portfolio decision makers should go out of business – take up plumbing, teach Greek...'* (1974) Such barbs draw blood: the biggest threat to the active manager today is the passive index tracker. When asked whether one could liken passive index trackers – who are the commoditizing forces of the fund management industry – to blindfolded monkeys, one of my drier ex-colleagues replied that *'the comparison insulted the monkeys'*!

- ❖ the dangers posed by excessive M3 growth to South Africa's inflation targeting regime
- ❖ the repercussions of Argentina's currency peg for GDP growth and
- ❖ the Marshallian-K residual available for share purchases in India.

The economics profession can rest assured; economic theory was the daily bread of our business.

So why then did the Emerging Markets fund management industry worldwide singularly fail, on a risk-adjusted basis and when measured in US dollars, to make money for its clients during the second half of the 1990s?

Backing up: what prompted me to do this thesis – a real world crisis

In late 1997, working in Baring Asset Management's London-based Emerging Market Department meant coping with Asian 'flu' in our stock portfolios. The consequences were far-reaching: within a year of the outbreak of 'Bahtulism'⁵, the Asian Contagion infected bourses everywhere in the Emerging World – Johannesburg, Buenos Aires, Moscow, Mexico City, Istanbul.

If there was one risk that surpassed all others in this meltdown, it was currency devaluation. Directly, as the following table shows, it accounted for about 50% of the decline in dollar stock prices during the year that followed. Indirectly, the *fear of devaluation* prompted waves of pre-emptive selling by international fund managers that accounted for much of the balance. And redemptions by open-ended mutual fund investors scared of both possibilities forced our industry to make yet further 'forced sales'.

Currency June '97 to June '98 ^a	Currency versus \$	\$ performance of index	Currency's share
China	0.12%	+3.1%	Essentially fixed rate
Hong Kong	0	-43.3%	0% - fixed rate
Indonesia	-83.2%	-89.3%	93.2%
Malaysia	-39.3%	-73.3%	53.6%
Philippines	-36.2%	-58.9%	60.5%
Singapore	-15.4%	-54.2%	28.3%
South Korea	-35.2%	-71.0%	49.6%
Taiwan	-19.2%	-31.9%	60.2%
Thailand	-39.9%	-67.6%	59.0%

Within a year, the falls in Asian asset values had been dramatic – Thailand, Indonesia, South Korea and Malaysia saw their dollar market capitalisations shrink by two-thirds or more. Furthermore, currency falls were far greater than might have been predicted by PPP-style analysis.

At one particularly stressful point in the process, Nancy Curtin, my team leader, made the following observation that bluntly summed up our predicament. She used a variant of traditional terms-of-trade logic:

The trouble with Asia is that it has no pricing power in its exports. Is it any surprise therefore that they have no pricing power in their currencies?

Until then, we had (as had most of our fraternity) mostly hidden behind the fig-leaf logic of the demand-biased Purchasing Power Parity to do our currency forecasts. We naively assumed that each stock we bought 'only' had to

^a Krugman P., 1999

^b Some measures of currency depreciation show currencies 'falling by more than 100%': when viewed from a domestic perspective, this more correctly means that the value of the US dollar has risen by more than 100%. However when the Indonesian Rupiah went from 2432 to 14750 to the US dollar (as was the case above), one can understand why an Indonesian might feel that the Rupiah 'fell' 504%. This table is presented from a US \$-centric perspective; note that cross-comparisons of falls in this method are non-linear. Data Source: *The Economist*, 25.6.97 and 24.6.98

outperform the inflation differential between the target company's host country and the US for the portfolio holding to achieve US dollar profit, the US dollar being the unit of account for virtually all our funds.

But beneath it all, we had long been uneasy with the idea that PPP explained emerging market currency movements – over time, depreciations had tended to be far in excess of the inflation differentials. Perhaps something else *in addition to* PPP ('in addition' because PPP still represented the eminently sensible '*real*' idea of adjusting for relative inflation rates) was at work?

For the academic types, the search for answers sent us back to our textbooks. Currency models – such as Goldman Sachs's GSDEEMER approach or UBS Warburg's FEER approach – became more sophisticated and, prompted by reading lists supplied such analysts such as Alberto Ades⁷ and Joachim Fels⁸, some portfolio managers found themselves caught in the academic crossfire that was arcing across Economics journals at that time. I remember one particularly 'heated' – in both senses of the word – discussion with a rival fund manager in the back of a taxi in Mohandessin, Cairo, as to whether Egypt might adopt a 'corner solution' in its currency policy or whether, if its central bank was only nominally independent thereby compromising its monetary policy, it could still hope to maintain the other two legs of the '*Incompatible Trinity*'⁹: a freely flowing capital account and a stable exchange rate¹⁰.

But most of us felt that the Economics profession was missing something by focussing almost exclusively on macroeconomic issues. Our proffered riposte

⁷ Goldman Sachs's currency strategist

⁸ Morgan Stanley's currency strategist

⁹ Obstfeld M. and Taylor A., 1998

¹⁰ Fleming J.M., 1962; Mundell R., 1963

in defence of our micro bias was ‘*But we buy companies, not countries*’ and we could see things happening at the micro level that no amount of ‘stable macroeconomic framework’ – *much as we needed that also* – could solve.

In parallel, we had started to re-examine the concept of ‘commodity currencies’, an idea that had long been fitfully applied to valuing the Australian, Canadian and New Zealand dollars. In this exercise, we monitored a wide cross section of data. One trend in particular caught our attention. For the countries whose export profile was dominated by so-called ‘traditional commodities’ – Russia and its oil, Zimbabwe and its tobacco, South Africa and its minerals – there were only limited private sector, long-term capital inflows (specifically Foreign Direct Investment – FDI).

Upon closer examination, we realised that the net ‘flow of funds’ situation in such countries would have been far worse but for exchange controls which restricted capital *outflows*. Even where their capital account door was ‘ajar’, as in South Africa, aggressive real interest rate policies were required to help stem the otherwise likely outflow.¹¹ There was strong evidence that, given a free choice, these countries’ own private sectors (especially where contractual savings were involved) would have directed a far greater proportion of their own free cashflows available to fund long-term investment *outside* their own countries.¹²

¹¹ This still did not stop a gross outflow of \$9.6bn for the 1994-1999 period, and a net outflow of \$1.6bn. Furthermore a high proportion of what inflow did happen was proceeds from the sale of existing assets (most notably privatisation of Telkom, the Airports Authority and others) *not the really critical sub-sector of FDI, new long-term investment in new job-creating ventures*. (Data Source, *The Economist*, 24.2.2001.)

¹² Where private capital could exit by the ‘back door’, it often did so, most visibly in Russia. In South Africa, private capital made highly visible exits through *the front door*. Directly or indirectly, the following companies shifted their domicile to London – Anglo American, Billiton, South African Breweries, Old Mutual, Didata. Since then, by way of acquisition, Anglo Coal, Anglo American Investment Trust and now De Beers have followed suit. This means the top seven companies by market capitalisation in 1999

Extending this observation to East Asia, we reasoned that the severe deteriorations noted in regional terms of trade from 1995 onwards reflected the fact that *their manufactured exports were 'commoditizing'*.

We were not alone in our observation.

Export overkill: while Western corporations underwent years of re-engineering to boost returns on equity, much of East Asia was fixated on adding production capacity and gross sales. The conglomerates of South Korea, Thailand, Malaysia and Indonesia piled up debt to build ever-bigger petrochemical, auto and steel plants. They ended up frantically competing in thin margin commodities in an age of falling prices, for by the mid-1990s, there were gluts in most of the industries they targeted.¹³

In such circumstances, was it not natural that the countries of East Asia were now experiencing capital flight, obviously that of the more skittish foreign portfolio investors and banks but even the 'hot money' of resident nationals?

The BCA, noting the circular relationship between falling prices and falling currencies, gave the following explanation of how the Asian Contagion spread:

The burden of adjustment – falling prices – had to be borne disproportionately by Asia. Indeed, the process proved too slow in 1996-

(Richemont is based in Switzerland but also run out of London) as listed by Bridge are now 'offshore'. An eighth of that ten, Anglo Platinum, is now controlled from offshore. Domestic savings institutions to this day have a default asset allocation to take their maximum possible foreign allowance offshore (between 15% and 20%); few doubt that given a free choice, they would take a far greater percentage of their assets out of South Africa.

¹³ *Business Week*, 29.11.1999

*1997, and ultimately devaluations proved necessary to shift the deflationary pressures out of Asia. The Thai devaluation of mid-1997 effectively put Thailand's manufactured goods on sale for half price. Such sales are contagious by definition. Other countries had no choice but to follow.*¹⁴

Corporate Thailand cut its dollar product prices and rival companies in Malaysia and the Philippines were soon obliged to match these cuts, which they did with assistance from their governments when the latter cut the 'national price', the dollar value of the Ringgit and Peso currencies respectively. *Perhaps commoditizing products were helping to undermine currencies?*

There was a micro method available to us that could confirm this 'commoditization' hunch. As with all fund managers, we researched our target investment companies thoroughly. In doing so, we performed traditional microanalysis on possible investment candidates using, as one of our tools, Stern Stewart's EVA® methodology. It emerged that many emerging market companies were 'destroying value', unable to generate Net Operating Profit After Tax above their Weighted Average Cost of Capital charge.¹⁵ One interpretation of this observation was that the insufficient returns meant that items produced by such companies were now 'commoditized'.

In Asia, this widespread failure by corporations to earn returns that covered their cost of capital came on the back of a period where regional investment rates had been running at about 30% per annum for almost a decade. At this rate, it was hardly surprising that chronic overcapacity had developed in

¹⁴ *Bank Credit Analyst*, January 2000

leading export industries. Neither was it therefore surprising that finished product prices had fallen and (properly costed) returns on capital invested had firstly diminished and then often turned negative. Here was the micro proof behind Krugman's 'Myth of the Asian Miracle' article. In 1994, he noted:

*Indeed several of the East Asian 'tigers' have recently become significant exporters of capital. This behaviour would be extremely odd if these economies, which still pay wages well below advanced-country levels, were rapidly achieving advanced country productivity. It is, however perfectly reasonable if growth in East Asia has been primarily input-driven, and if the capital piling up there is beginning to yield diminishing returns.*¹⁶

The tentative conclusions we came to were as follows:

1. The devaluing of a country's currency was but part of a much wider 'de-valuation' process. Much of the balance of this value compression was reflected in the fall of that country's corporate wealth as measured by the US dollar value its stockmarket capitalization. Some value destruction showed up (but was not always 'crystallized') in non-performing loans in banks, both on domestic and crossborder exposures. At the root of both these types of 'de-valuation' was value destruction at the corporate level. And this value destruction at the corporate level was significantly due to the commoditization of a wide range of exported manufactures.

¹⁵ It has to be noted that the knock-on effects of high domestic real interest rate regimes, often being used to shore up exchange rates, onto the calculation of the domestic cost of capital played a critical part in such value destruction.

¹⁶ Krugman P., 1994; Krugman uses the term 'productivity' here in its traditional economic sense, as a measure of labour not capital productivity.

2. At the macro level, this process was initially reflected in the trade and then current accounts of these nations as their terms of trade deteriorations turned surpluses into deficits that could not be financed by matching longer-term capital inflows. Led by Thailand, currencies had to give which thereby contracted dollar GDPs.

In the longer term, commoditization had capital account consequences as well.

3. Once corporate commoditization had become widespread, the domestic owners of free cashflow would logically want to remove it from a country where new economic value could not be easily created. Such free cashflow, if properly applied, was still capable of financing value-creating prospects in the next round of its utilization. But, in much of East Asia, increasingly few such value-creating prospects existed at home. Where free cash flow could be remitted offshore through increased profit declarations, capital flight was also recorded on the current account.

A bigger question then occurred to me: '*Could nations themselves commoditize?*' The thought was only half formed, and part of me rejected the idea out of hand as in some way heretical. Yet upon reflection, an uneasy logic began to take shape that suggested the conclusion: 'yes'.

Sir Alec Cairncross recalled Keynes's view on how a new idea was born.

I particularly remember a lecture in 1933 when Keynes tried to convey how new ideas were born. Never did they arrive, he said, with the hard edges that later critics came to attribute to them when trying to define their terms...Ideas were apt to be like fluffy balls of wool with no fixed

outline, and the relationship between concepts when first perceived was likely to be equally woolly. Keynes mistrusted intellectual rigour as likely to get in the way of original thinking, and saw that it was not uncommon to hit on a valid conclusion before finding a logical path to it.¹⁷

This thesis is an attempt to find a ‘*logical path*’ to this conclusion that countries themselves might commoditize by asking two main questions:

1. How does commoditization arise at the product level?
2. How does one trace this process through from the micro level to the macro level?

The bias of this thesis: Painting a picture, and not just by numbers

Detractors of the discipline of economics often claim that it has become too theoretical by focussing on mathematical models at the expense of ‘ideas’ – that the main body of Keynes’s *General Theory* is almost totally devoid of mathematics is an oft-cited rod used to beat the back of the modern profession.

This claim is not new. Marshall lamented and advised over a century ago:

I have a growing feeling that a mathematical theorem dealing with economic hypotheses is very unlikely to be good economics, and I go more and more on the rules:

1. *Use mathematics as a shorthand language rather than an engine of enquiry.*
2. *Keep to them until you have done.*

¹⁷ Sir Alec Cairncross writing in *The Economist*, 20.4.1996

3. *Translate into English.*
4. *Then illustrate by examples that are important in real life.*
5. *Burn the mathematics.*
6. *If you can't succeed in 4, burn 3. This last I do often.¹⁸*

The 'arcane mathematics' theme recurred – Max Planck was to tell Keynes that the reason he did not take up economics was that the '*maths was too difficult*'; Joan Robinson was to bemoan the fact that economists had taken to hiding behind '*thickets of algebra*'.¹⁹

This thesis intends, following Brittan's exhortation²⁰, to '*use a different idiom*'. Or rather it will use Krugman's variant of Marshall's idiom²¹:

1. *Figure out what you think about an issue, working back and forth among verbal intuition, evidence and as much math as you need.*
2. *Stay with it till you are done.*
3. *Publish the intuition, the math, and the evidence – all three – in an economics journal.*
4. *But also try and find a way of expressing the idea without formal apparatus.*
5. *If you can, publish that where it can do the world some good.*

Krugman's prescription will be followed with one additional qualification. By looking at the economics of commoditization from an evangelically market perspective, it takes Marshall's central advice to heart: '*Then illustrate by*

¹⁸ Sills, D. L. and Merton, R. K., 1968

¹⁹ Ormerod P., 1994

²⁰ *Financial Times*, 20.12.2000

²¹ Krugman P., *Two Cheers for Formalism*, his old MIT website, now in transit to Princeton, <http://www.wss.princeton.edu/~pkrugman>

examples that are important in real life’ or, in Keynes’s words, through *‘vigilant observation’*.²² Because of this, this thesis has a strong bias towards using corporate examples to illustrate the points it makes, notably in the micro case studies of Section 5.

In addition, notice is given of the fact that the mathematics of this thesis is driven more by the need to understand the creation of value through interpreting a company’s profit and loss statement than it is by using equations and differential calculus. That said, braving Robinson’s ghost, one unavoidable *‘thicket of algebra’* occurs in Section 3h A-B.

The approach used herein explores the financial economics of commoditization. In doing so, it combines or ‘jumps together’ modern corporate finance theory with traditional microeconomics in a framework that is micro-based. The focal point of this Whewellian ‘consilience’²³ is the marrying of the product lifecycle with a market definition of the cost of capital to obtain a precise definition of the concept of commoditization.

It is important to state here the definition of commoditization as will be used in this thesis and to emphasise it is above all a micro, product-based definition from which a macro variant is derived:

A commoditized product is one whose industry is unable to cover the cost of capital still embedded in its production thereby, in business terminology, “destroying value”.

²² Skidelsky R., 1992

This rationale behind this definition is set out below. Suffice it to say here that scarcity is the cause of all value-addedness, and as such scarcity is at the root of all successful capital reproduction.

Furthermore, the capacity to generate true value-adding profits is dependent upon an industrial structure that is in no way perfectly competitive, *especially* in the New Economy. Few have summed this up more succinctly than Larry Summers²⁴:

*The only incentive to produce anything is the possession of temporary monopoly power... Without such power, the price shall be bid down to the marginal cost and high fixed costs cannot be recouped. So the constant pursuit of that monopoly power becomes the central driving thrust of the New Economy. Economics of information requires an imperfect market so innovators can recoup investment.*²⁵

Thus it will be shown that conditions can arise where a product is produced under what will be defined as ‘insufficient’ scarcity, an operating environment that will be called the ‘*Paddock of Abundance*’. Operating in this world results in a decline in the relative wealth of that product’s producers vis à vis those producers still capable of generating value-addedness.

In such a world, it is usually the intervention of the very visible hand of politics that stays the gathering forces of financial gravity by subsidizing or compensating the value destroyers. This arises mainly from the democratic imperative arising out of modern political economy. This requires the state’s

²³ Whewell W., 1847

²⁴ Nor, in a sense, more surprisingly: when he said it, he held the *political* office of the US Treasurer, yet he spoke like a *financial* economist.

²⁵ As quoted in the *The Economist*, 23.9.2000

hand to intervene in the still productive sectors of a nation's economy and tax the value created there for redistribution towards the value destructive, commoditized sectors. In this behaviour, modern democracies appeal to the celebrated logic of Robin Hood.

As noted above, this thesis will be evangelically 'financial' in that it tracks the changing fortunes of products as reflected at the company and industry levels. But the analysis does not stop at the micro level. By profiling the combined product supply of a nation, its 'aggregate supply', a nation's place in the global hierarchy of value-addedness can be identified and the possibility of a commoditizing country then arises²⁶.

At the macro level, this thesis will extend a line of thinking begun by Vernon.²⁷ His 'International Product Cycle' model came out of Leontief's test of the Heckscher-Ohlin theorem and was Vernon's explanation as to why the U.S. was apparently exporting labour-intensive goods. Vernon noted that the U.S. is likely to export goods during their 'new product' stage when research and development is still labour-intensive.

Porter has recently revived Vernon's approach. Like Vernon, he was trying to explain the insufficiency of comparative advantage in determining trade, believing that Ricardo's traditional rationale was insufficient. As Porter noted of other lines of enquiry:²⁸

The most comprehensive is Raymond Vernon's 'product cycle' theory.

²⁶ Note that it is the express aim of this thesis to avoid discussing 'macroeconomics', especially as it refers to how a government's monetary and fiscal policies try to shape 'aggregate demand'. Rather when this thesis talks 'macro', it is primarily with the intention of understanding 'aggregate supply'.

²⁷ Vernon R., 1966

The macro approach here is wholly compatible with Vernon's interpretation, but overlays the concept of factor and 'function'²⁹ of production succession *within* countries to Vernon's product succession *between* them. The point of succession in both cases is shown to be closely tied to the concept of commoditization.

Everything else in the thesis flows from understanding commoditization, the world that exists where an industry behind a product is no longer capable of producing 'something of value'. *En passant*, other issues that might have appeared disconnected also find their place in the framework, seemingly casually, but in fact causally, often fitting in with almost mechanical precision. For example, Bhagwati's insights into antitrust and the difference between a market share approach and one based upon contestability slot very productively into this thesis. (**Section 3h – c.**)

This thesis does not aim to be revolutionary – in History of Economics terms, it can be argued that it is *almost* Classical in tradition. Furthermore, this thesis reconfirms – on occasion having first seemed to question – many of basic tenets of economics. These include the relevance of such issues as profit maximisation (examined herein through the pursuit of a profitable 'path' more than a static 'point'), the near gravitational forces of supply and demand and the usefulness of employing models to focus attention on the critical aspects of otherwise complex situations. It also flirts with, and accedes to, some of the tenets of the New Economy as some economic canons have indeed evolved.

²⁸ Porter M., 1990

²⁹ To be expanded upon below; essentially the know-how of '*how to produce in quantity, sell in quantity and do both these functions cost effectively*'.

But it reaffirms the traditional commandments of economics, none being more crucial than the overriding importance of 'scarcity'.

In fact, far from being revolutionary, this thesis consciously tries to be 'evolutionary', a characteristic that arises directly from its micro-level focus on the dynamics of the product lifecycle, and the corresponding macro level focus on the dynamics of factor and function lifecycles. This approach has obvious parallels with Schumpeter's insight that '*The essential point is that in dealing with capitalism, we are dealing with an evolutionary process*'³⁰.

Schumpeter did not have in mind the Darwinian sense of biological progress of natural selection but rather the sense of evolution that is covered by '*changes in economic life as are not forced upon it from without but arise by its own initiative from within*'.³¹ By contrast, this thesis does not shy away from the parallels that can be drawn from evolutionary biology. Prompted by the writings of Dawkins³², the definition of a unit of capital is seen as being akin to a metaphysical gene that survives, when properly used, by reproducing itself.

The approach employed does challenge some of the more usual methodology in two main respects:

Firstly, its central determination is to **create dynamic interpretations** to explain why local price equilibria rarely last – an ambition that leads to an all-important showdown with the need to reconcile time to concepts that have usually been interpreted statically.

³⁰ Schumpeter J., 1942

³¹ Simpson D., 2000

Secondly, following Marshall's advice, this thesis is determined to **square real world observation** – which usually means that of how financial markets calculate 'value' – with the classic tools of the economic trade.

In both these departures, the inductive logic may be unconventional set against a more traditional deductive approach but, in the light of the evidence presented and braving charges of being guilty of what Schumpeter called the '*Ricardian Vice*'³³, the general conclusions noted do appear to conform with the facts.

In this departure, this thesis heeds Kaldor's plea that economic theorizing should start with '*stylised facts*' that are commonly observable within the real world – for instance '*companies are born, they sometimes grow large and eventually most die*' – and infer inductively a model to account for these facts.³⁴ Assumptions and implications of the inferred model are then re-examined for plausibility, and exceptions categorised as to whether they merely qualify the rule or fatally wound it.

The central '*stylised fact*' of this thesis is, to paraphrase Keynes:

In the long run, nearly all products 'die' as well.

It then asks, in Darwin's words, why these '*unfavourable ones (tend) to be destroyed*'.³⁵

³² Dawkins R., 1982; 1986; 1989

³³ Schumpeter J., 1954

³⁴ Kaldor N., 1972; 1985

³⁵ Darwin C., 1876

This thesis then seeks to extend commoditization to the macro level by defining it in relation to countries, even if the more sanitised word of '*marginalization*'³⁶ now appears to be in common usage.

To make this bolder assertion, that countries can also '*die*' in the sense of ceasing to be value creative, would be to evoke a Yeatsian revelation that things can also fall apart at a national level³⁷. This would in turn create a vision of the commoditization of nations that will surely trouble the sight of every economist, to say nothing of every politician.

Why this thesis was – indeed almost had to be – done in South Africa

There has been a deliberate relevance to writing this thesis in South Africa, an economy that has historically been heavily geared towards natural resources and more recently burdened with the '*resource curse*' afflicting commodity producers³⁸.

Indeed, one can argue it would have been almost impossible to write this thesis other than in South Africa or a similarly positioned country: many of the insights could only have been gleaned – often from the most '*innocent*' of observations – from living in a country on the cusp of commoditization.

There is no mention of '*policy recommendations*' within the main body of the thesis. The penultimate section before the conclusion – Section 14 – does offer

³⁶ For instance, see: United Nations website claiming '*Havana conference assails 'marginalization' of Developing Countries*' at www.un.org/ecosocdev/geninfo/afrec/subjinds/142g77.htm

³⁷ After Yeats W.B., 1920

³⁸ An argument rehearsed variously including Manzano O., Rigobon R., 2001; Sachs J.D. and Warner A.M., 1995

some remedies to the fall-out from commoditization. But in the main, this thesis seeks to explain, after Jevons, the '*what is*', not the '*what ought to be*'.³⁹

My economic preferences have been those of the hard-nosed liberal: a belief in free trade, a Hayekian preference for the workings of the free market, and a somewhat begrudging capitulation to the involvement of government in the economy, but only in times of genuine hardship. Consequently I do not like the findings of this thesis. This is hardly surprising given my own African and Middle Eastern upbringing and my career choices thus far.

The findings herein suggest that the plight facing developing nations will not be overcome by their simple adherence to the principles of the free market. This has redirected my economic compass back towards the originality and practicality of Keynes, particularly his often-overshadowed microeconomic observations⁴⁰ and his Bretton Woods prescience on the global consequences of unrestrained capital mobility. Checking this drift has been the magnetic pull of Schumpeter, his image of creative destruction and his associated observations on the politics of economics and the likely tortured evolution of capitalism. Finally, as with Keynes, my attention could not escape the earth forces of the proto-Darwinist economics of Malthus⁴¹. I have become convinced that many of the *economic* arguments made by Carlyle's dismal scientist remain largely intact. Indeed I share Darwin's assessment that Malthus's *Essay on Population* being '*absurdly misunderstood*'⁴², even as it critically underestimated the

³⁹ '*Economics treats men as they are, not as they ought to be.*' Jevons W.S., 1871.

⁴⁰ Especially Chapter 17 of Keynes J.M., 1936.

⁴¹ It is arguably more accurate to call Darwinism neo-Malthusian.

⁴² Letter from Charles Darwin to Alfred Wallace, 5.6.1866; letter 191. Darwin E., 1887.

refreshing power of education and technology and did not foresee the salving relief of modern day government spending.⁴³

The net result is that my enthusiasm for liberal capitalism has been tempered into the same double-negative logic used by Churchill to endorse democracy – it is the worst of economic systems, except for all the others.

Even so, it is my fervent hope that this thesis might return to its place of writing – South Africa – certain insights about the process of commoditization. As a result, it might enable my academic host and similarly positioned countries to have a better chance of meeting the challenges of globalisation.

The texts for this thesis: Sraffa's 'Unfinished Business from 1926' and Brenner's 'Malign Invisible Hand'

Although working in Marshallian Cambridge during the 1920s, Sraffa did not agree with the prevailing Marshallian conventional wisdom. He wrote that despite '*the tranquil view which the modern theory of value presents us, there is one dark spot which disturbs the harmony of the whole*'⁴⁴. His dark spot was the supply curve. For the Marshallian interpretation to hold, Sraffa felt that both perfect competition and constant returns were necessary preconditions. Sraffa did not accept these as representative of the real world. Rather, he

⁴³ Schumpeter (1942) largely dismissed Malthus by suggesting '*the only valuable things about Malthus's law of Population are its exceptions*'. John Stuart Mill would beg to differ. Much of the criticism of Malthus was directed at his 'compound mathematics'; as Mill noted, '*...Every candid reader knows that Mr. Malthus laid no stress on this unlucky attempt to give numerical precision to things which do not admit of it, and every person capable of reasoning must see that it is wholly superfluous to his argument.*' Mill, I.S., 1864.

⁴⁴ Sraffa P., 1926

maintained that the foundations of the Marshallian interpretation were *'actually so weak as to be unable to support the weight imposed upon them'*⁴⁵.

Robinson and even Keynes suspected that Sraffa was on to something, but largely because of the dramatic events of the late 1920s and 1930s, it was unlikely that a view that identified supply as the 'culprit' would make much headway. Keynes's view was rather that there had been a massive failure of demand. Even so, in a letter to Keynes in 1932, Robinson wrote:

*I think that, like the rest of us, you have had your faith in supply curves shaken by Piero. But what he attacks are just the one-by-one supply curves that he regards as legitimate. His objections do not apply to the supply curve of output (as a whole) – but heaven help us when he starts thinking out objections that do apply to it!*⁴⁶

Sraffa's reservations arising from his 1926 paper also concerned *'the process of diffusion of profits through the various stages of production and of the process performing a normal level of profits throughout all the industries of a country.'* However, he noted that this was a problem *'beyond the scope of this article'*⁴⁷.

The product lifecycle (PLC) is, as will be shown below, the manifestation of *'the supply curve of output as a whole'* for a product over time. The PLC approach also allows one to gain insights into *'the process of diffusion of profits through the various stages of production'*. As applied in the second part of this thesis, it even allows one to monitor *'the process performing a normal level of profits throughout all the industries of a country'*

⁴⁵ Sraffa P., 1926

⁴⁶ Moggridge D., 1973

⁴⁷ Sraffa P., 1926

If this thesis has an ambition, it is to extend the scope of Sraffa's 1926 article.

There are many other sets of shoulders upon which this thesis stands, from Malthus to Darwin and on to Dawkins, from Schumpeter to Vernon and Ormerod. One set deserves special mention: those of Robert Brenner. At a critical stage in the research behind this thesis, his 1998 article, *'The Economics of Global Turbulence'*⁴⁸, by focussing on the medium term consequences of intrafirm competition (thus emphasising 'horizontal' capital vs. capital competition rather than 'vertical' interaction between the owners of capital and labour⁴⁹), on how overcapacity can lead to overproduction, the influence of exchange rates on corporate profit margins and on the macro implications of these observations, broke the increasingly sterile heat of the demand-side vs. supply-side debate in the same way as October storms break the oppressive heat of the Kalahari Desert.

By developing the concept of commoditization, this thesis provides what Brenner sought – *'a theory of a malign invisible hand to go along with Adam Smith's benign one'* – and, by so doing, provides an explanation for the phenomenon that Brenner describes (though he does not use the term): the 'commoditization' of most manufacturing industries worldwide.

⁴⁸ Brenner R, 1998

⁴⁹ Not only does this approach contrast with the traditional trade-off in standard economics between capital and labour – perhaps best symbolised by the Cobb-Douglas Function – but Brenner upset the Left (who had seen him as one of their standard bearers) by *explicitly* downgrading the 'class struggle' that is central to their approach. For Brenner, the real battle is one of capital against capital.

Commoditized. No company wants that word applied to its goods or services. Merely mentioning 'commoditization' sends shivers down the spines of executives and entrepreneurs alike. Differentiation disappears, margins fall through the floor, and customers buy solely on the basis of price, price, price.

Opening words of 'The Experience Economy'⁵⁶

Most companies have become low margin commodity producers. Only the successful and profitable ones are innovators. They sell innovations with high profit margins. But they have to sell them fast before they too become commodities and are destroyed by the next round of innovation.

Ed Yardeni, Deutsche Bank⁵¹

The New Commodities⁵²

<u>Now</u>	<u>Next?</u>
Personal Computers	Servers
Hotel Rooms	Car Rentals
Legal Services	Credit
Police Cars	Generic Drugs
Ocean Shipping	Insurance
Bandwidth	Pharmacy Services
Network Hosting	Data-storage capacity
Manufacturing Capacity	Multi-billion dollar infrastructure projects

'Le Monde n'est pas une marchandise' – 'The World is not a Commodity'; a populist slogan first seen in anti-Seattle WTO Meeting demonstration in Paris; adopted as title of book by José Bové, the anti-McDonalds French farmer and now rallying cry for Western critics of 'Globalisation'.⁵³

⁵⁰ Pine J. and Gilmore J., 1999

⁵¹ www.yardeni.com

⁵² *Fortune*, 13.11.2000

⁵³ *The Daily Telegraph*, 1.7.2000

Section 1.

Thesis Outline and Summary Finding

1 a) The Object of the Exercise

This thesis centres on understanding the evolution of a product through its lifecycle – typically from its creation through possibly being a patented item via a branded good to its final stage: **becoming commoditized**. It then extends this logic to the national level and raises the possibility that nations too can become commoditized.

The Micro Section

The micro component (**Sections 2 through 6**) examines the industry-based foundations of commoditization by combining the product lifecycle (PLC) with the cost of capital to come up with a precise, *financial* definition of 'commoditization'.

Section 2) defines the principle concepts employed in this thesis, '*commoditization*' and, by contrasting it to its traditional economic sense, '*financial scarcity*'.

Section 3) reclaims to economics from the business world the principal tool used in this thesis, the product lifecycle. This is done by deriving it from first principles by combining dynamically two of the most basic tools in economics – the demand curve and the supply curve. By tracing a product's life through

six stages of industrial organization, from its birth at monopoly through the middle age of oligopoly towards a senility that *starts* to exhibit the 'aging lines' associated with the world of perfect competition, it is shown how commoditization arises.

Section 4) examines in detail the economic roots of firstly the cost of capital and secondly the measure derived from deducting the latter from the product lifecycle, producer pricing power. In this context, the precise nature of financial capital is then re-evaluated.

Section 5) The Micro Case Studies – the Evolution of the PLC through six Rounds

The five development stages leading up to the value-destructive sixth – commoditization – are each highlighted by real world examples. Chronologically these are: the IPO of VA Linux; Microsoft; De Beers; Gillette; Ford; and Cargill. **Section 5** is built around the question: *'How would capital view investment prospects of companies given the lifecycles of their product lines?'*

Section 6) summarises the findings of the first micro half of the thesis by looking at the past, present and future of the product lifecycle and by recapping how value is added by companies.

The Macro Section

By extrapolating from corporate bricks to national walls, the macro component (**Sections 7 through 13**) shows how commoditization can 'stalk' nations.

The connecting logic suggests that the evolution of corporate value creation at the micro level underpins national wealth creation at the macro level.

What emerges is that, in the economic era since about 1760, there have been broadly seven dynasties of value creation, each dynasty centring on a cluster of products derived from the intensive exploitation of one of seven factors or functions of production. Chronologically these were, firstly the factors: land, factory-based labour and machine capital; and then the functions: how to make products in quantity, how to sell products in quantity and how to make and sell products in quantity cost-effectively. A seventh factor, knowledge, is seen to run ahead of the value-creating process at all times.

It will be suggested that a particular dynasty starts to be displaced in the affections of capital by its successor dynasty when its underlying product cluster exhibits the aging lines that precede commoditization. The marginal unit of financial capital deselects the old order in preference of newer prospects likely to be more value-creative. Thereafter, the share of value creation generated by the older dynasty declines before eventually turning negative.

Where free capital cannot find newer opportunities within a national boundary, national wealth creation can stall **unless and until** a new value-creating product cluster arises, thereby allowing a new dynasty to succeed the old.

Alternatively, if capital controls are porous, that capital might try to exit the country concerned in search of greener pastures.

Section 8) summarises the seven dynasties of value creation and how dynastic succession between them occurs.

In Section 9), these dynasties are employed schematically to describe the economic evolution of the most economically advanced – and, not by coincidence, the wealthiest – nation on earth, the United States. It illustrates the make-up of the seven dynasties of corporate (*'which types of companies were most valuable when'*) and individual (*'who got rich how and when'*) value creation that have occurred in the US over the past two centuries.

Section 10) borrows Adam Smith's idea of the division of labour and extends it to the division of capital. It depicts financial capital as a metaphysical mountaineer clambering up the Himalayas of wealth creation, conquering the highest visible peak of the latest value-creating dynasty, only to abandon it when the mists of ignorance clear to reveal a still higher peak. The factors and functions of production of previous dynasties become the base camps that furnish the supply of capital required to assault that next peak of value creation.

Section 11) examines the macro implications of the paradox of *'abundance amidst scarcity'* raised in Section 2). The demands of democratic politics have made the conquest of scarcity arguably its primary economic objective. In practice, this means the political process actively promotes abundance. But there comes a point at which this tends to conflict with the demands of efficient capital utilization, herein illustrated by how a *micro* equivalent of Say's Law would not always work. Two concepts – a Twilight Zone and an Economic

Plimsoll Line – detail operating conditions of this '*abundance amidst scarcity*'. By extending these ideas to the macro level, the recent failure of the Japanese economic model can be explained in these terms. It also offers an explanation as to why 19th century *laissez faire* economic liberalism transformed itself into its 20th Century *ne laissez pas faire* neo-liberal successor.

The seven-dynasty model applied to the United States in Section 9) is applied globally in Section 12). The evolution of corporate value broadly suggests the same chronological sequence of dynasties is followed by every nation, a sequencing that approximates 'economic development'.

By identifying which dynasty is reigning in a broad sample of countries, it is possible to draw strong conclusions as to where that country will rank in the wealth of nations. This involves 'fingerprinting' each nation as to the character of its leading corporations so as to determine its approximate dynasty.

Section 13): The Macro Case Study – Helping to explain exchange rate movements in an era of free flowing global capital

The core finding is that one of the principal forces driving global capital flows today is the desire by the owners of capital to reinvest free cashflow derived from its current place of employment not simply 'productively' but *reproductively*. Such free cashflow arises not just from businesses that are approaching or have reached commoditization but also from ordinary citizens and their mutual fund agents. Where such money arises in countries that are close to or have reached commoditization, the traditional measures that are used to determine fair value for exchange rates such as purchasing power parity

and even interest rate parity would need to be supplemented with a new measure: *that of 'risk-adjusted, dollar-based, return on investment' parity.*

Close examination of global FDI trends can help identify which countries are the net originators and which are net recipients in this reinvestment process.

It will be shown that cross-border flows are biased in favour of countries exhibiting the newer dynasties of corporate value creation, their capital account needs being funded from countries characterised by the older dynasties. Traditionally such flows from the old to the new might have been more obvious *within* countries; now they are increasingly evident *between* them.

This observation helps explain why advanced economic nations tend to run current account deficits, such deficits being the equal and opposite consequence of net inflows on their capital accounts, investment returns from the dynasties of yesterday and even today pursuing the value-creating dynasties of tomorrow.

Given these cross-border flows, it follows that the direction of exchange rate movements will – where allowed by exchange controls – strongly hint at whether the reigning dynasty of a particular country is still value-creating (or has good prospects of being so) and so by extension where that country is likely to rank in the wealth of nations. Where free movement of capital is *not* allowed by exchange control regulations, it is very likely (though not sufficient 'proof' in and of itself) that either that nation is relatively low in this 'league table', or is in danger of becoming so.

The other finding suggested is that if a country 'commoditizes', that country's *relative* wealth will first stagnate and then decline in the global context. This is

because the net effect of the resultant likely capital outflows – be they arising from wholly domestic sources or through profit repatriation by foreigners – is that they often precipitate a decline in the affected nation's exchange rate, thereby reducing that country's US dollar GDP and so reducing its rank in the dollar wealth of nations.

Any free cashflow arising out of that 'commoditizing' nation's activities will, where allowed, often flow offshore. This capital will be seeking those activities still capable of returning a risk-adjusted, increasingly dollar-denominated, *true economic profit*. Where these outflows are generated from assets that are already foreign owned, they are very unlikely to return. Even where this exodus is generated from domestic sources, there is a chance that a portion might not return. In particular, if these flows constitute capital flight, there is virtually no way of ensuring their repatriation.

Policy Pointers

Section 14) summarises my policy recommendations arising from this thesis.

Conclusion

Section 15) summarises the findings of this thesis.

1 b) The Central Finding of this Thesis

The central contention arising from this thesis is that nearly every product is subject to the corrosional forces of commoditization, and that deferring this decay requires extraordinary skill on the part of suppliers. Only a few products of enduring scarcity – a first edition copy of Charles Darwin's *On the Origin of the Species by Means of Natural Selection* for example – have a chance of maintaining, and conceivably even growing, their value over time.

Commoditization arises from the relentless erosion of an industry's pricing power beyond the point where it becomes impossible for that industry to cover its cost of capital charge.

This destiny results from a pincer movement executed between the increasingly competitive behaviour of suppliers and the strengthening purchasing power of consumers. For instance, over time consumers become less inclined to pay up for brand margins. In parallel, rival firms compete away true profit margins – in extremis to zero and even beyond. In this rivalry, mastering cost structures, product positioning, technology platforms and risk-finance markets are critical to corporate survival as a value-adding enterprise.

Understanding the role of capital *in its fundamental manifestation as a unit of financial value* is central to determining whether a particular product has commoditized. Modern finance theory suggests that any investment not covering its cost of capital – even though it may still be 'profitable' in an accounting sense – is destroying more capital value than it is creating. If industry-wide, the contention of this thesis is that the product being produced has commoditized.

As Drucker has noted:

Until a business returns a profit that is greater than its cost of capital, it operates at a loss. Never mind that it pays taxes as if it had a genuine profit. The enterprise still returns less to the economy than it devours in resources. Until then it does not create wealth; it destroys it.³⁴

University of Cape Town

³⁴ Drucker P., 1994

The Micro Foundation

Section 2.

The Commodity Defined and Financial Scarcity Redefined

2 a) The word 'Commodity': its evolving meaning in economics

'this commodity.....this all-changing word....'

Shakespeare, King John/ II.1.581-2

When the word '*commoditee*' entered the English language in about 1410, it meant '*benefit, profit, welfare*'.⁵⁵ As used in financial markets today, it means '*a mass-produced unspecialised product*'.⁵⁶ One can argue that over the past 600 years, the word itself has '*commoditized*', losing the sense of special value it once had.

The word '*commodity*' as used in economics has evolved in parallel with the theory of value⁵⁷. In the opening chapter of *Das Kapital* (which was entitled '*The Commodity*'), Marx defined a commodity as:

*..first of all, an external object, a thing which through its qualities satisfies human needs of whatever kind.*⁵⁸

⁵⁵ 1988. *Chambers Dictionary of Etymology*

⁵⁶ *Merriam-Webster Online Dictionary* www.m-w.com/home.htm

⁵⁷ This section relies heavily on the review at <http://online.bce.etc.edu/econ100/ksttext/index.htm> of the evolution of the various theories of value summarised by Taylor K.S. 1996

⁵⁸ Marx K., 1867

Deriving his reasoning mainly from Ricardo, Marx noted that:

*The value of every commodity is (in perfect equilibrium and perfect competition) proportional to the quantity of labour contained in the commodity, provided this labour is in accordance with the existing standard of efficiency of production.*⁵⁹

This allowed Marx to define industries by reference to who controlled them, the factory owners and bankers. It underlined Marx's emphasis on returns to fixed capital in his process of determining value, a factory age upgrade to Ricardo's agricultural focus on rent to landowners⁶⁰. Ricardo's view was an outgrowth of the Smithian view that a price was derived from 'adding up costs'. Collectively, this interpretation came to represent the Classical School's definition of commodity.

This foundation allowed Marx to add to Smith and Ricardo's Labour Theory of Value and develop his own Theory of Exploitation. He concluded that:

*As values, all commodities are only definite masses of congealed labour time.*⁶¹

By extending the classical tradition, Marx gave primacy to production and the supply side of the equation in the determination of a commodity's value.

This approach was disputed by the Continental tradition of Say and Gossen. They saw *utility* and thus *demand* as central to the determination of price and

⁵⁹ Marx K., 1867

⁶⁰ Kamenka E., 1983

⁶¹ Marx K., 1867

therefore value. Jevons was among the first to break away from the British tradition focussing rather on the pleasure-generating usefulness of a commodity⁶²:

*By a commodity, we shall understand any object, substance, action or service, which can afford pleasure or ward off pain.*⁶³

He further challenged the Ricardian tradition positing:

*Cost of production determines supply;
Supply determines final degree of utility;
Final degree of utility determines value.*⁶⁴

Jevons was joined by Marshall, who modified Jevons's cantena as follows:

*Utility determines the amount that has to be supplied;
The amount that has to be supplied determines cost of production;
Cost of production determines value.*⁶⁵

By giving primacy to utility, Marshall gave more emphasis to the demand side of the equation. But re-reading his 'scissors' quote⁶⁶, one senses that his main aim was to restore the balance between demand and supply by countermanding the 'supply first' school. In this respect, Marshall was more of a 'synthesiser' than a 'side-taker'.

⁶² 'The conclusion to which I am ever more clearly coming is that the only hope of attaining a true system of Economics is to fling aside, once and for ever, the mazy and preposterous assumptions of the Ricardian School. Our English Economists have been living in a fool's paradise. The truth is with the French School, and the sooner we recognize this fact, the better it will be for the world.' Jevons W.S., 1871

⁶³ Jevons W.S., 1879

⁶⁴ Jevons W.S., 1879

⁶⁵ Marshall A., 1890

This pursuit of ‘balance’ was emulated by Walras in his general equilibrium theory. But it was Marshall who was to epitomise the Marginalist Revolution. By shifting conventional wisdom across from focussing solely on the ‘supply side’ to recognise the importance of the ‘demand side’, he promoted the Marginal Theory of Value in place of Marx’s Labour Theory of Value.

The definition of ‘commodity’ had thus shifted away from the Ricardian view. Both Jevons and Marshall were to think of a commodity as a good each unit of which was perfectly substitutable one for another on a utility curve, thus underlining the characteristic of fungibility. This assumption relied upon two further preconditions – perfect competition and constant returns.⁶⁷

Böhm-Bawerk, reviewing the theories of value up to 1894, highlights the largely forgotten contribution of Dietzel. The latter’s approach claimed that:

*The value of scarcity goods is determined by utility, while the value of freely reproducible goods is determined by costs*⁶⁸.

Through the medium of a product lifecycle and with only slight qualification to the ‘absolute one-sidedness’ of Dietzel’s distinction, ***this will be the approximate finding of this thesis.***

⁶⁶ ‘We might as reasonably dispute whether it is the upper blade of a pair of scissors that cuts a piece of paper, as whether value is governed by utility or cost of production.’ Marshall A., 1890

⁶⁷ As will be shown below when the product lifecycle reaches its final stage, the assumption of utility’s primacy under conditions of perfect competition – which, where equilibrium prevails, requires constant returns – is not unreasonable. Thus the definition used in this thesis will not materially contradict this view, merely extend it.

⁶⁸ Böhm-Bawerk E., 1894-95

Keynes used the word 'commodity' in the Marshallian sense but recognised that when the marginal efficiency of capital falls below the interest rate '*a point comes where it is not profitable to produce any of the commodities*'.⁶⁹ In doing so, he came close to defining a 'commodity' as will be done in this thesis.

Sraffa used the word 'commodity' in his enigmatically entitled '*Production of Commodities by Means of Commodities*'⁷⁰, developing a distinction between *basic* and *non-basic products*. He maintained that at least one basic commodity entered directly or indirectly into the production of all items, whereas non-basic commodities did not. The Sraffian or Neo-Ricardian 'Theory of Value' remains the main challenger to Marshall's 'Marginal Theory of Value'.⁷¹

In today's financial markets, the terms '*commodity*' and '*commoditized*' have negative connotations as recent financial press usage illustrates:

- *Encyclopaedia Britannica's decline since 1990 ... has been precipitous. Today, the total media market for the Encyclopaedia is a tenth of what it was in 1990. New technology has redefined the reference book business. As Jonathan Helliwell, media analyst at Goldman Sachs, argues, 'first the CD-ROM and then the Internet have turned publishers of reference books into purveyors of a commodity product.'*⁷²
- *Mr Jager (of Proctor & Gamble) blames the consumer product industries problems on its failure to innovate. It has... 'lead to commodity products and pricing pressures'.*⁷³

⁶⁹ Keynes J.M., 1936

⁷⁰ Sraffa P., 1960

⁷¹ Kurz H. and Salvadori N., 2000; essay included in Kurz H., 2000

⁷² *The Financial Times*, 23/24.10.1999

⁷³ *The Economist*, 30.10.1999

- *The advantage that banks traditionally enjoyed over non-banks in judging borrowers' creditworthiness has been eroded by IT: products such as home mortgages have become automated and commoditized.*⁷⁴
- *The Salmoneros face some serious obstacles. Chile, which dramatically reduced world salmon prices when its export-savvy government began promoting salmon farming a decade ago, now faces the challenge of adding value to a product that has become a commodity. Upmarket products, mostly aimed at busy U.S. families, such as fillets packed with condiments and recipes, make up more than 50 cents on the dollar of salmon export income. 'Before, supermarkets didn't want to hear about value-added products,' says Rodrigo Infante... 'But we have to do this. If you're in a commodity market and the price drops, you're dead.'*⁷⁵

In a single issue of *BusinessWeek*⁷⁶, three varied markets – computers, wireless telephones and wine – are said to be becoming, or have become, commoditized.

- *Starting with the desktop in 1984, Dell has been able to commoditize other Wintel markets – first the notebook, and then low-end servers.*
- *Wireless is becoming a commodity.*
- *The trend of single grape varieties might lead to an absurd 'commoditization' of a product where historical and/or cultural trends are supposed to be an integral part of the consumers' pleasure.*

⁷⁴ *The Economist*, 22.1.2000

⁷⁵ *BusinessWeek*, 24.1.2000

⁷⁶ *BusinessWeek*, 24.9.2001

2 b) 'Commoditization' and 'Commodity' as defined in this thesis.

In this thesis, the following two definitions are used:

Commodity:

**A product produced by an industry
that is unable to cover the capital charge
on capital still embedded in its production.**

Commoditization:

**The point in the lifecycle of a product that signifies that
the capital employed in its producing industry has
reached the end of its reproductive life. Ideally
that capital will then be redeployed elsewhere.
If it is not, it will henceforth be progressively
destroyed by remaining employed where it is.**

Thus today's capitalist might respond to Jevons:

*By a commodity, I mean any object, substance, action or service, which
cannot afford the pleasure of capital profit or ward off the pain of
capital loss.*

2 c) The Commodity in today's financial markets

The term '*commodity*'⁷⁷ as used in financial markets often describes a product:

- where the purchase decision is based largely upon price.
- that, because it is easy to produce, has no true profit margin embedded in that price, even though it may be 'profitable' before imputing a capital charge to the residual margin.
- that has virtually no brand content making it homogenous with the equivalent offerings of competitors.
- that is supplied by an industry with low barriers to entry.
- that almost certainly has substitutes meaning if its price were to rise, demand would switch to those substitutes.
- where the supplier has virtually no pricing power i.e. is a price-taker.
- whose *real* price tends to decline over time, though nominally cyclical may increase it but with successive nadirs usually being lower in real terms.
- for which there is surplus production capacity ('supply-in-waiting') in the system including significant inventory in the intermediate pipeline. Small price rises trigger large supply increases, which soon swamps incremental demand.

The above characteristics combine to create an environment where capital employed in the product's production is, on balance, unlikely to generate sufficient returns to cover the imputed cost of capital still employed in the producing industry.

⁷⁷ This includes its various derivatives, especially '*commoditize*' and '*commoditization*'.

2 d) When Financial Scarcity gives way to Financial Abundance

A central aim of this thesis will be to resolve the following conundrum:

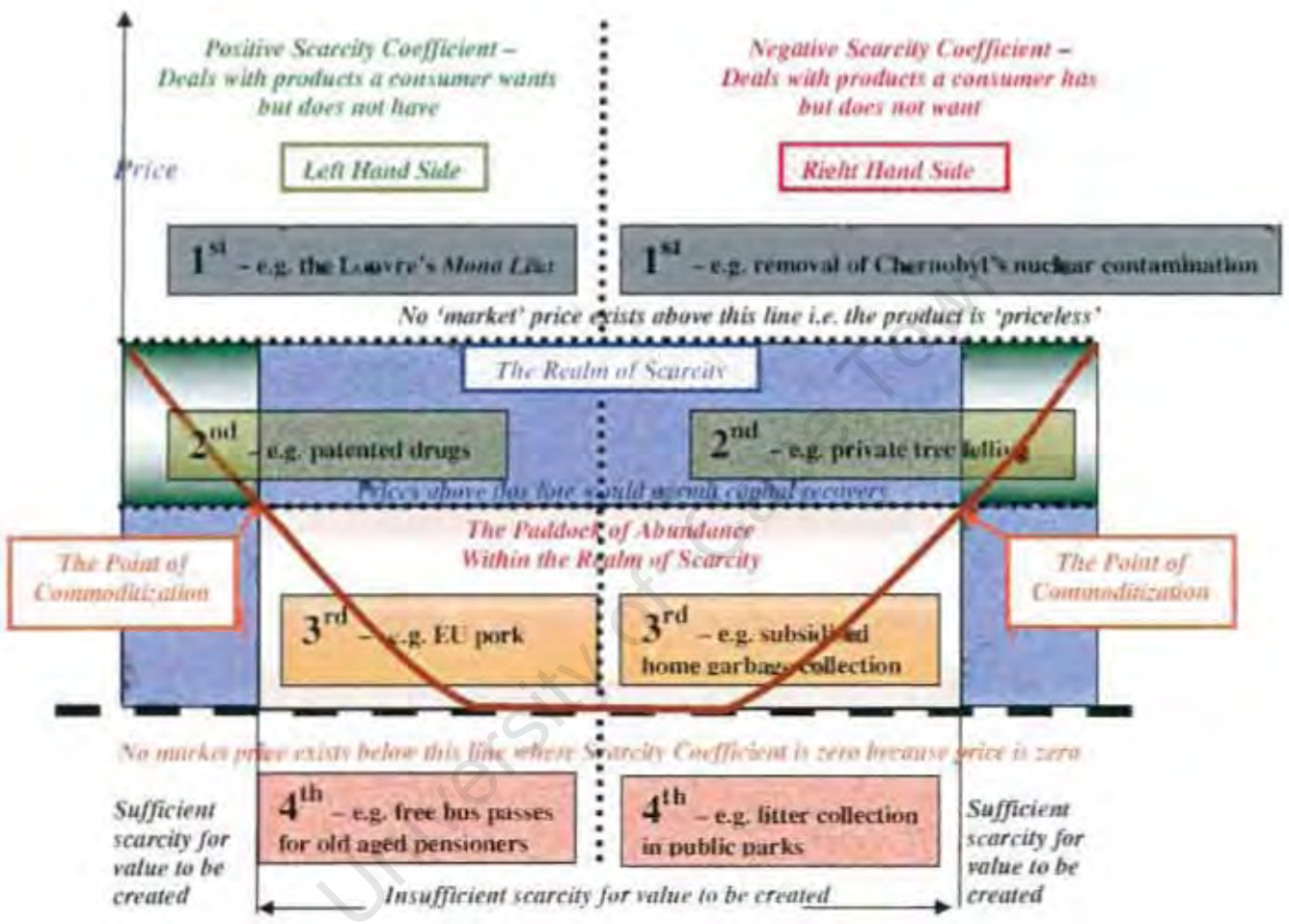
How can a price – which by its very existence represents a scarcity coefficient, usually positive, on occasion negative – be attached to a product that is nevertheless being produced ‘in abundance’?

The short answer (this thesis being the *long* answer!) is that classical economics defines ‘scarcity’ somewhat less restrictively than would modern finance. The discipline’s traditional framework holds that any product with a price is ‘scarce’. By contrast, as defined by the more demanding requirements of the world of finance, that same product may have become ‘insufficiently scarce’ for a capital investor to earn a return sufficient to cover the imputed cost of capital still embedded in its production. Such a product will have become commoditized, ‘abundant’ in the eyes of the suppliers of capital, even if it is still ‘scarce’ to the guardians of the traditions of economics.

This distinction is the Golden Thread woven into the fabric of this thesis. It is evident throughout it, being revisited in a macro context in [Section 11](#).

As a framework for understanding this critical departure from traditional economic thinking, *the nature of price* is discussed below, first diagrammatically and then summarised in greater detail in tabular form. This allows not only for the distinction between economic and financial scarcity to be drawn more tightly, but also for one to be reconciled to the other.

What results is a 'U'-shaped price spectrum that would cover all priced products, noting that a few 'priceless' products can and do exist outside this spectrum. Note how a product *can* have a negative scarcity coefficient but still have a positive price (2nd and 3rd quartiles on the right hand side).



Notes to the above diagram

1. The market is the Realm of Scarcity where prices exist – defined as being within the blue box, encompassing the 2nd and 3rd 'quartiles'. No market exists where no prices exist – the 1st and 4th quartiles (the latter of which is more precisely the *line* under the 3rd quartile where price equals zero).

2. Financial capital is only *productively* employed in the 2nd quartile.
3. The 3rd quartile covers prices for any products that would destroy capital. To financial economists, this quartile would be the Paddock of Abundance; to classical economists, it is still within the wider Realm of Scarcity. It includes both prices for products that would cover their cash costs but not their capital costs (and so be self-sustaining though not capable of generating value-addedness) and those products incapable of doing either (for which some sort of outside contribution – e.g. a government subsidy – would ultimately be necessary if the firm/industry producing the product was to continue doing so.)
4. Included in the 3rd quartile would be the still smaller 'sub-Paddocks' of the Twilight Zone and the Valley of Death, both of which relate to the more practical issue of cashflow. These are addressed in detail in [Section 11](#).
5. Aside from the value destroying representatives of the private sector operating in the 3rd quartile, many state-provided goods would tend to be found in this quartile as well. Consider subsidized public transport (highlighted by the recent collapse and effective renationalization of Railtrack in the UK): *'My train ticket price costs me money but the price would not cover the full cost of capital employed in the provision of this service; either that is 'ignored' by the operator or the Government must make up the difference'*.
6. Governments will likely be involved in activities priced in the 2nd and 3rd quartiles and provided free in the 4th quartile. Current conventional wisdom suggests that the state *'leave the 2nd quartile to the private sector'*, which is arguably a tighter definition of *'the free market'*.

The above diagram is now covered in greater detail in tabular form. The table's sequential arrangement relates to the above diagram as follows:

Starting with the 1st quartile on the left hand side (where the scarcity coefficient is positive), it continues through the 2nd and 3rd quartiles to the point of zero scarcity coefficient – the 4th 'quartile'⁷⁸. It then continues on the right hand side from the 4th 'quartile' (where the scarcity coefficient is negative) via the 3rd and 2nd quartiles to end in the 1st quartile.

Note that upon occasion the prices achieved can nevertheless lead to cyclical losses; in such circumstances if the product can regain and sustain value-creating status, this is assumed to be a temporary phenomenon. (The important issue of 'cyclicality' is dealt with extensively below, especially in [Section 3h – F](#).) What is being examined here would be a 'smoothed' price reflecting the medium-to-long term, *structural* price received for the sale of a given product.

Overall 'status' of market	A price...	Demand as characterised by logic of consumer (D)	Supply as characterised by logic of supplier (S)	For example...
Outside even the Realm of Scarcity (1 st Q – LHS)	Does not exist, but even so the market knows the product to be very valuable ('priceless')	D wants it, but it is not available at any price	If S sold it, it would be at a value creating price, but it is 'not for sale' at any price	The <i>Mona Lisa</i> in the Louvre
The upper limit of the market beyond which no negotiated price exists; above this point, products are 'priceless'				
The Realm of Scarcity (2 nd Q – LHS)	Exists	D wants it, can afford it and needs to pay a value-creating price to get it	S will meet demand at a price that creates value in terms of covering S's cost of capital employed in the provision of the product	Patented drugs

⁷⁸ Again the 4th 'quartile' is more correctly the line under the 3rd quartile, a line where the price is zero.

This price represents the Point of Commoditization				
The Paddock of Abundance within the Realm of Scarcity ($3^{rd} Q - LHS$)	Exists	D wants it, can afford it and need only pay a value-destroying price to buy it.	S will meet demand at a price that destroys capital value <i>but covers S's cash costs</i>	Most automobiles
The Paddock of Abundance within the Realm of Scarcity (<i>Also the $3^{rd} Q - LHS$</i>)	Exists	D wants it, can afford it at the price offered which only amounts to a contribution to its cash costs	S accepts a price that both destroys capital value <i>but does not cover S's cash costs</i> , with the difference required for S to cover cash costs being made up by e.g. a Government Subsidy	Subsidized European Union pork
The lowest negotiable price available that can buy the product in the market Above this point, there is a positive scarcity coefficient				
The Realm of Charity; the product is provided free by Governments or NGOs ($4^{th} Q - LHS$)	Does not exist as the product is supplied without charge	D wants it and, because it is available free, D can consume it	Governments, NGOs, etc deem that the good needs to be provided for free and do so	Free bus passes for old aged pensioners, the BBC World Service
Zero scarcity coefficient				
The Realm of the Free Public Service ($4^{th} Q - RHS$)	Does not exist as the service is performed without charge	The service is performed free whether D wants it or not	Governments, NGOs, etc deem that the service needs to be performed for free	Litter collection in public parks
The lowest available price available in the market required to take the product away Below this point, there is a negative scarcity coefficient				
The Paddock of Abundance within the Realm of Scarcity ($3^{rd} Q - RHS$)	Exists as owner can meet the charge being asked by the market to take it away	D does not want it, and can afford to make a contribution to the cost of having it taken away	S meets demand at a price that destroys value and – were it not for a subsidy – would not cover S's cash costs	Garbage collected by the City Council but the cash costs of that service are only partially recovered through rates
The Paddock of Abundance within the Realm of Scarcity (<i>also $3^{rd} Q - RHS$</i>)	Exists as owner can meet the charge being asked by the market to take it away	D does not want it, and can afford to make a contribution to the cost of having it taken	S meets demand at a price that destroys capital value but covers S's cash costs	Garbage collected by the City Council with the cash cost of that being recovered through rates.

		away		but not the capital cost
This price represents the Point of Commoditization				
The Realm of Scarcity (2^{nd} $Q - RHS$)	Exists as owner can meet the charge being asked by the market to take it away	D does not want it, and can afford to have someone take it away	S meets demand at a price that creates value in terms of covering S's cost of capital employed in the provision of the service.	Private waste removal services that do make returns in excess of their cost of capital
The highest negotiable price at which the market would be willing to take a good away				
Outside even the Realm of Scarcity (1^{st} $Q - RHS$)	Does not exist but the market knows that it would be extremely expensive to buy the service if it could be bought	D does not want it yet no amount of money will induce someone to take it away	There is no S that can perform this service because no amount of money would induce someone to perform it	Possibly restoring Chernobyl to being a safe farming area. (More humorously, 'removing the body in my deep freeze'!)

Note also that there is a price point possibility that occurs in a product lifecycle immediately after the product's launch but before the product has become value creating. The future may *look* good, but the product has yet to prove itself in value-creating terms. During this 'as yet unproven' stage, this product could be said to be being produced – strictly speaking – under conditions reigning in the Paddock of Abundance (and that is where it would technically register on the above diagram). If the product did fail to recoup its investment, it would have been 'still born' in value creating terms (dubbed below '*being born a cold cake in a sinking ship*').

Section 3: An Idea Reclaimed from the Business World – the Product Lifecycle

3 a) The Product Lifecycle (PLC)

Kuznets formulated a lifecycle concept in 1930⁷⁹ in developing a 3-stage 'launch-maturity-decline' curve,⁸⁰

Keynes also foreshadowed the lifecycle concept by noting:

It is much preferable to speak of capital as having a yield over the course of its life in excess of its original cost, than as being productive. For the only reason why an asset offers a prospect of yielding during its life services having an aggregate value greater than its initial supply price is because it is scarce; and it is kept scarce because of the competition of the rate of interest on money.⁸¹

Friedman subsequently applied the lifecycle concept to the formulation of his Permanent Income Hypothesis⁸² and Modigliani to his Savings Hypothesis⁸³.

The **Product** Life Cycle appeared in the economics of Williams⁸⁴, MacDougall⁸⁵ and Posner⁸⁶ but has been used more in the fields of management consultancy⁸⁷. Jones claims to have formulated the 'S' curve

⁷⁹ Kuznets S., 1930

⁸⁰ Stutz F. and DeSouza A., 1998

⁸¹ Keynes J.M., 1936, especially Chapters 16 and 17

⁸² Friedman M., 1957

⁸³ Various since 1953; in particular, Modigliani F., 1986

⁸⁴ Williams J.H., 1947

⁸⁵ MacDougall D., 1957

⁸⁶ Posner M.V., 1961

⁸⁷ From the history of the Product Lifecycle in Raymond Vernon's *Palgrave* entry, 1998

variant in 1955⁸⁸. By 1965, both versions had been adopted within the business school fraternity, notably by Levitt⁸⁹ at Harvard. His work, with its strong marketing bias, has led to a widespread acceptance of a 5-stage PLC sequence: '*Introduction-Growth-Maturity-Saturation-Decline*'^{90, 91}.

In 1966, one of Levitt's colleagues, Vernon, adapted lifecycles to international trade⁹² suggesting that products were first produced in mature markets then relocated to less mature, cheaper production locations from which products would be re-exported back to the original producers.

Yet economics has not been welcoming of the extension of the lifecycle idea to the product. Vernon noted:

*The disposition of economists to use (this) process as a basis for formal inductive or deductive analysis has been extraordinarily limited ...The ideas have surfaced from time to time...only to slip back into limbo.*⁹³

He also noted, as Darwin had noted of species:

*No one will deny that products come into existence, change in character and eventually disappear or become altered out of all recognition.*⁹⁴

⁸⁸ Booz Allen's website describes Jones's inspiration – of the basic 'S' curve variety – thus: '*Suddenly, Jones went to the blackboard and sketched out two axes and a curving trend line; it looked like a steep hill, levelling off in a plateau. This, Jones told Johnson excitedly, was what happened to products over time. Their "lifecycle" dictated that they be born, grow quickly, capture market share, then level off. The double curves, of profits out of phase with volume over time, demonstrated why new products must be introduced continuously. Companies could not grow indefinitely with the same product.*' www.bah.com/wcb/productlife.html

⁸⁹ Levitt T., 1965

⁹⁰ For example see Stevenson W.J., 1999

⁹¹ As will be shown, it is the 'saturation' phase has obvious parallels to commoditization.

⁹² Vernon R., 1966

⁹³ Vernon R., *Product Lifecycle* entry, 1998 *Palgrave Dictionary of Economics*

⁹⁴ Vernon R., *Product Lifecycle* entry, 1998 *Palgrave Dictionary of Economics*

In the business world, the PLC generally appears in one of two related forms – either a ‘full’ curve incorporating both the rise and fall of a product, or a truncated ‘S’ curve format⁹⁵ where the original product is succeeded by a subsequent upgrade. If done repeatedly, this latter version is usually presented as a ‘family of S curves’. **A more revealing term might be a ‘family tree’, each new lifecycle representing a new generation of the product line.**

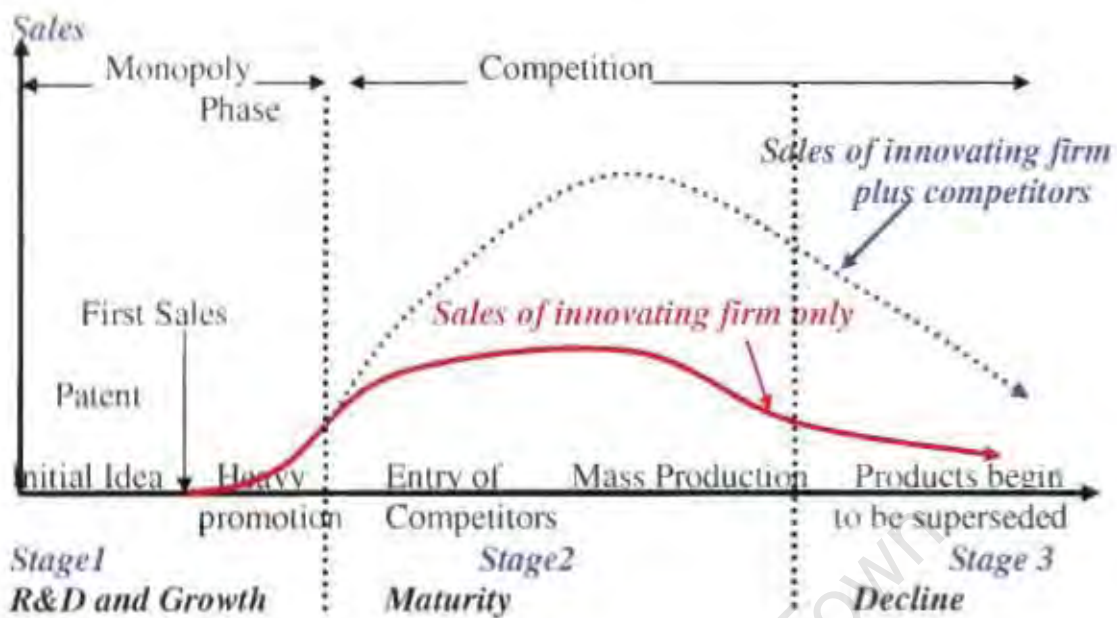
Both senses will be used below, the traditional version more extensively in the micro definition, the ‘family tree’ variety more extensively in understanding the longer-term evolution of value. In the very long run, both are shown to be related *if and when* a family tree of ‘S’ curves becomes part of a single ‘overarching’ PLC.⁹⁶

The business world generally tracks the industry curve, noting that initially the firm *is* the industry. Stutz and de Souza summarise this progression thus⁹⁷:

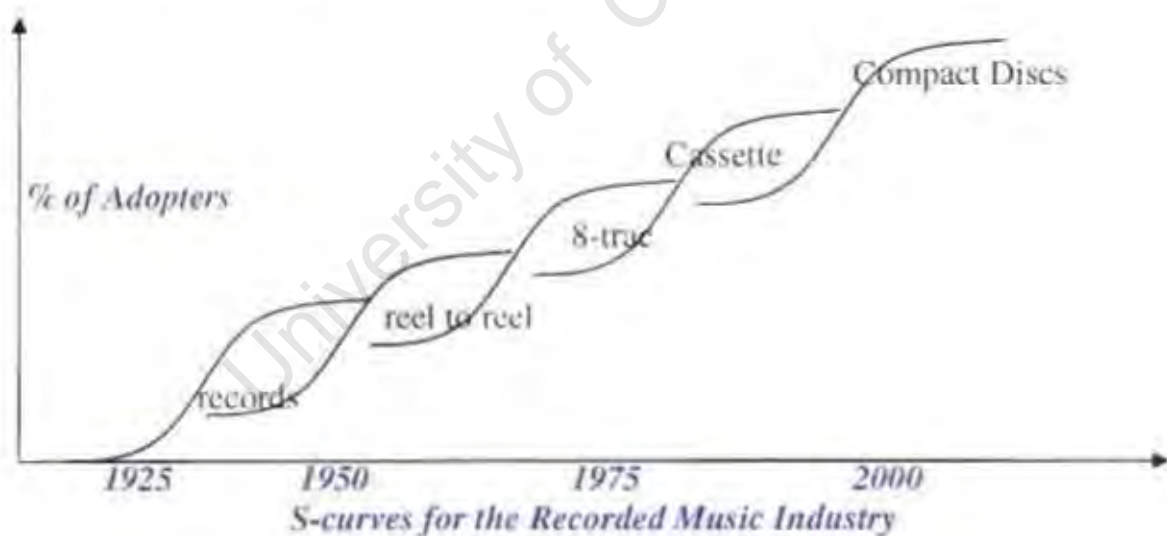
⁹⁵ Sometimes called a Gompertz curve; Kindleberger C., 2000

⁹⁶ Can the biological analogy be extended further? Is the arrival of a ‘disruptive technology’ the product line equivalent to the creation of a new ‘species’ of product, the automobile succeeding the horse-drawn carriage for instance?

⁹⁷ Stutz F. and de Souza A., 1998



They illustrate the S-curve 'family tree' version as follows, noting that the Y-axis is *the percentage of adopters*⁹⁸:



Each new generation of adopters is superimposed upon the older generation, part supplementing them, part displacing them.

⁹⁸ Stutz F. and de Souza A., 1998

3 b) Combining the PLC and cost of capital

The principal feature of this thesis is to combine the PLC with a tight definition of the cost of capital. This derives a measure of the net producer pricing power possessed by an industry. If it is positive, value is being added; if it is negative, value is being destroyed. Making allowances for the start up period, the central contention of this thesis is once an industry's net pricing power has turned negative, its product has commoditised.

The cost of capital and producer pricing power are widely used concepts in business circles. [Section 4\)](#) will revisit their economic roots, and in particular discuss them in the context of the precise nature of financial capital. The balance of [Section 3\)](#) will derive the product lifecycle using the standard tools of economics.

Firstly however the next diagram shows the PLC and the cost of capital combined.

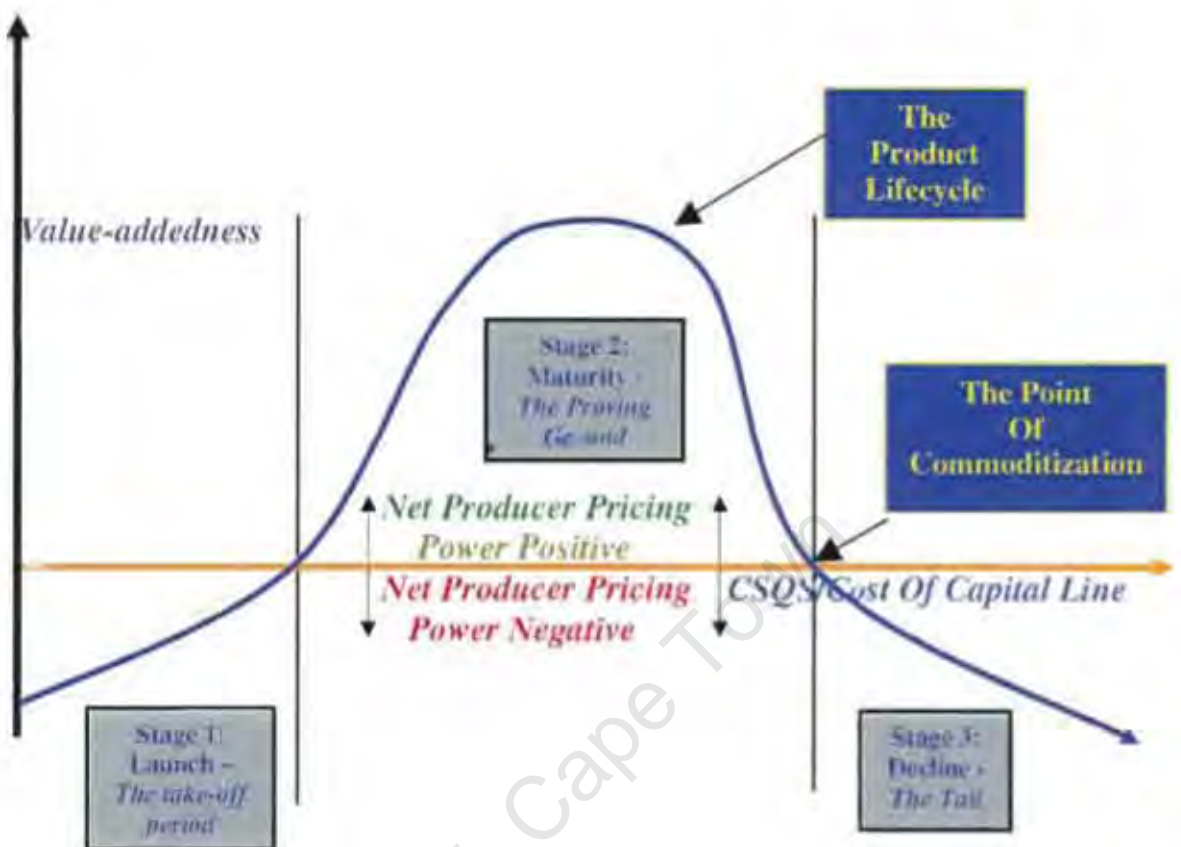
a) The axes are as follows:

Firstly, the x-axis is a quantity-related derivative that reflects the dynamic nature of the PLC's projection and accommodates time by recording the **cumulative sequential quantity sold (CSQS)** of the product. This measure introduces a degree of time neutrality into the PLC portrayal. Whether the payback period is 8 weeks – the typical Hollywood blockbuster – or 8 years – an ethical drug, perhaps – is not *especially* relevant; in both scenarios a hurdle rate representing the opportunity cost of capital is easily accommodated.

Secondly, the y-axis records **value-addedness**. This is a measure derived from deducting unit costs from unit price: as used herein, this will be the Net Operating Profit After Tax (NOPAT) margin common in corporate finance (discussed in greater detail in **Section 4a**). This measure is easily reconciled to the 'normal' marginal profit margin used in economics of MR-MC, subject to recognising the precise treatment of the tax (included), debt and equity capital costs (both excluded) employed in the NOPAT calculation.

Thirdly, (and conveniently, as this assists with the visual projection of this concept), **the cost of capital line is conjoined with the x-axis**. This means that, in the final definition of net value-added, marginal cost includes a per unit cost of capital charge and that value-added returns are discounted by the discount rate implied by the cost of capital. This also allows the residual PLC curve (above and below the axis) to be projected on an equal area, present value basis.

- a) The *Product Lifecycle* is drawn out in dark blue and shows the present value (using the y-axis as the base point in time) of the value created over the life of the investment.
- b) The *conjoined CSQS/ cost of capital line* is drawn in orange.
- c) Kuznets's characterisation of 'launch, maturity, decline' defines the three stages of the PLC (to be expanded to six Rounds below).
- d) The juxtaposition of the value-added line with the cost of capital line defines the all-important *point of commoditization*.



A typical product will go through three stages.

Stage 1: Launch – *the Take-Off.* Here the product is still prospective – launched but not yet covering its cost of capital. Start-up losses must be expensed. The cost of capital and other charges not covered in Stage 1 must be recouped in subsequent stages.

Stage 2: Maturity – *the Proving Ground.* Here a successful investment must justify itself. The cost of capital would be covered by returns and the surplus from this Stage, together with the ‘salvage capital value’ of assets employed when Stage 3 begins, would need to exceed the carried forward shortfall from Stage 1 to make the product a financial success.

Stage 3: Decline – the Tail. As far as this thesis is concerned, this is the critical Stage, known as ‘the Tail’ in investment circles. **At the beginning of Stage 3, the product becomes a commodity, as value-added falls below the cost of capital.** Even though the producing industry may be profitable in accounting terms (or simply cashflow positive), the unit cost of capital is no longer being covered. *If*⁹⁹ the industry’s asset base could be turned back into financial capital at the **start** of Stage 3 – **salvaged** – it could be used more productively elsewhere.

Salvage value can vary. Minimally, it would equate to the present value of cash flow receivable before the ‘death’ of the product (*less* any exit costs), a methodology resembling the ‘life-of-mine’ approach for an exhaustible mineral deposit. Where assets – typically land – trapped in the production process at the beginning of Stage 3 can be realised and reapplied elsewhere at a higher rate of return, the salvage value will be more ‘opportunity cost-based’. Such ‘break-up valuations’ may return higher amounts than ‘life-of-mine’ quasi-bond methods.

Cashing up ‘sunk’ assets still employed at the start of Stage 3 is often easier said than done. *This is because many company managements will deny their activity has commoditized, reasoning they are still profitable.* Their line of defence would be: ‘Why close our seemingly profitable company down?’ The disciplined supplier of capital in its monetary form would respond, after Drucker: ‘Because you are destroying more value than you are creating.’¹⁰⁰

⁹⁹ This is not always possible – when a deep level goldmine enters phase 3, closing the mine down by filling up the hole is an unlikely option. Normally the mine would operate until exhaustion; salvaging the embedded capital value is not practical. The main discipline required is not to spend any capital that cannot be justified. In less ‘physical’ industries, ‘salvage’ is an option when resources can be cashed up and redeployed. ‘Raiders’ – the UK’s Guy Hands – make fortunes ‘unlocking value’ in late lifecycle businesses.

¹⁰⁰ ‘Until a business returns a profit that is greater than its cost of capital, it operates at a loss. Never mind that it pays taxes as if it had a genuine profit. The enterprise still returns less to the economy than it devours in resources. Until then it does not create wealth; it destroys it.’ Drucker P., 1994

The precise point of commoditization is the critical observation here. The proof to be derived below in Sections 3c) through 3j) can be summarised as follows:

Commoditization arises when the twin forces of growing consumer purchasing power and declining corporate pricing power combine to reduce profit margins to the point where the supplying industry's average margin no longer covers the average unit cost of capital employed, thereby preventing the full regeneration of any embedded capital still employed in that industry.

Understanding the different motives of suppliers and consumers in this two-pronged 'attack' is critical to understanding commoditization.

This pincer movement may appear to be haphazardly co-ordinated between the two prongs. Yet rival suppliers use the motives of consumers in their campaigns to achieve their objectives. Meanwhile, consumers 'play off' suppliers against each another electing to switch to lower cost alternatives unless their original supplier gives way, usually by lowering price.

3 e) Back to Marshall and his Pair of Scissors

Marshall wrote, in one of his most famous passages:

We might as reasonably dispute whether it is the upper blade of a pair of scissors that cuts a piece of paper, as whether value is governed by utility or cost of production. It is true that when one blade is held still, the cutting is effected by the moving of another. We might say, with careless brevity that the cutting is done by the second; but the statement is not strictly accurate, and is to be excused only so long as it claims to be merely a popular and not strictly scientific account of what happens.¹⁰¹

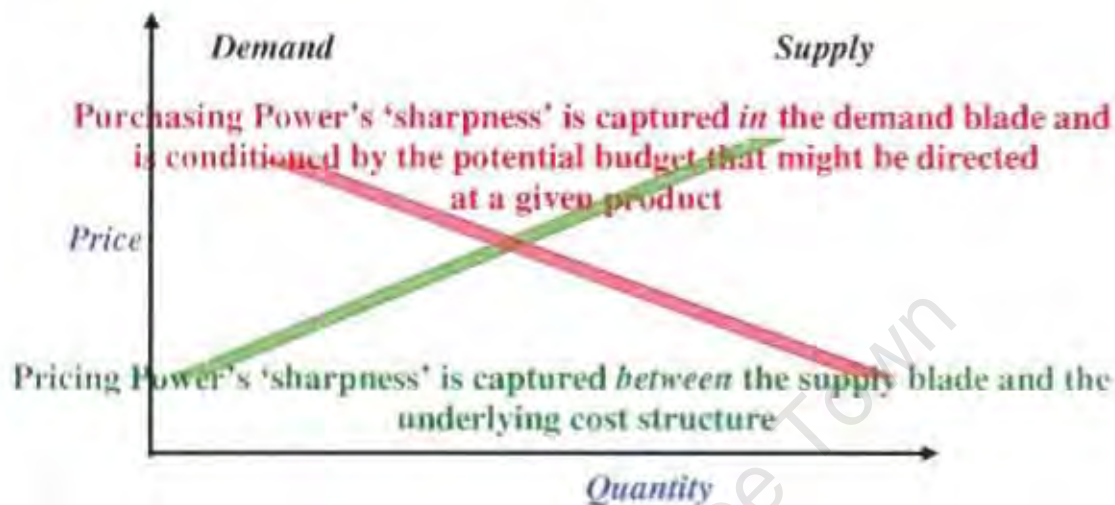
This thesis characterises pricing power as that cutting edge of supply possessed by producers. Conversely, purchasing power is that cutting edge of demand possessed by consumers. Marshall's scissors metaphor suggests that where these two edges *could* meet is the market, and where they *do* meet, that is the price/output combination agreed between buyers and sellers.

This section will extend the scissors metaphor by using another Marshallian contribution to economics, elasticity, to define the 'sharpness' of both blades. Marshall's scissors quote will be shown to be more profound than has heretofore been acknowledged.

¹⁰¹ Marshall A., 1890

3 d) How Pricing Power interacts with Purchasing Power to form the PLC

The classic supply/demand curve diagram



As a general rule, the essential object of the exercise for the forces of demand is to get as much of a product as they can afford for as low a unit price as possible.¹⁰² Purchasing power is captured in the demand curve and represents the effect that consumers can have on 'weighing down' on the supply curve – how much they can persuade the market to release at what price – conditioned by their ability to pay.

By contrast, the main object of the exercise for the forces of supply is, broadly, 'to make money'. How this is achieved – and in what combination with other objectives – varies. Some managements aim to maximize profit; others pursue revenue maximisation, usually with the associated belief that this leads to profit; yet other managements may pursue targets that satisfy neither of these objectives. That said, few managements would disagree with the ideal supply scenario being a single supplier selling only one good that cost very little to

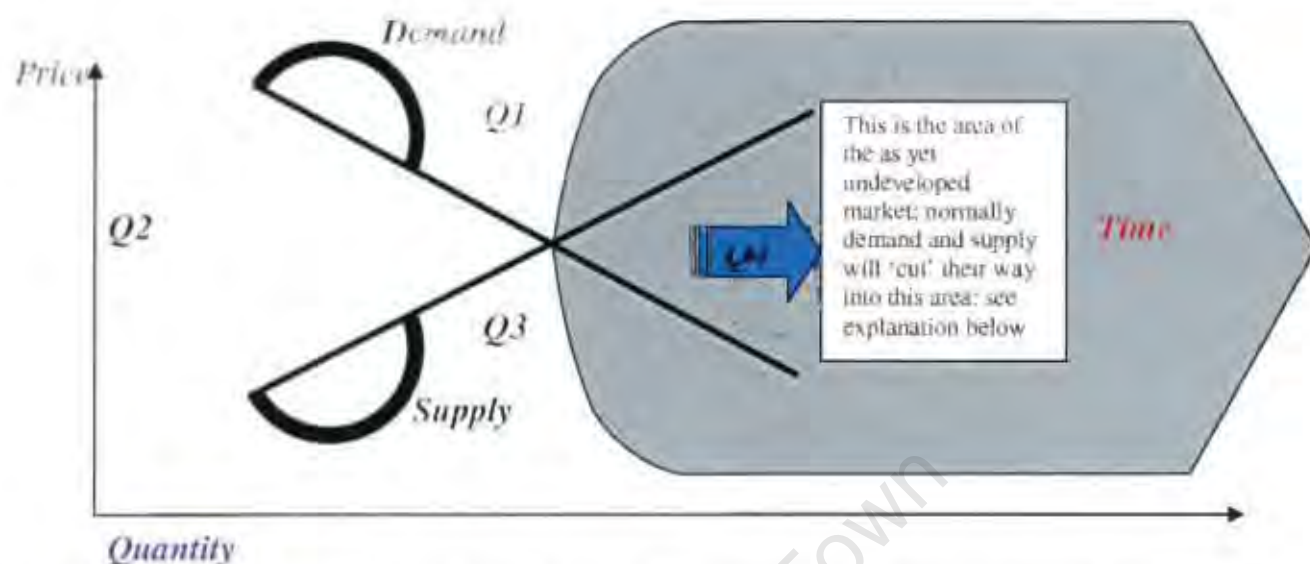
¹⁰² Some exceptions to this rule do exist but the generalisation broadly holds.

produce for 'all the money in the world'. Buried in this Nirvana is the essence of supply: for a seller to get as much revenue as possible from buyers whilst giving up very little in terms of costs. Consequently they want to see demand go as high as possible, both in terms of quantity and price. How successful the supply side is at achieving this will depend upon the evolution of their pricing power, that value-added margin between revenues achieved and costs borne.

Consumer purchasing power weighs down on the supply curve. One half of corporate pricing power pushes up from underneath the demand curve; the other bears down on costs. The point at which supply and demand meet represents the price/quantity combination at which aggregate consumer purchasing power is prepared to deal with aggregate corporate pricing power.

As a product's PLC evolves, cumulative quantity consumed rises. The interplay of pricing power and purchasing power will heavily influence what happens to price in that process. But the primary focus herein is not on price but on the value-added margin between unit price and cost. As a general observation (assuming returns to scale are still available), where growth in corporate pricing power is stronger than that of consumer purchasing power, marginal value-addedness will rise. Similarly, where the rate of growth of consumer purchasing power exceeds that of corporate pricing power, marginal value-addedness will fall.

One can look at the supply/demand curve combination through Marshall's eyes seeing them as a pair of scissors cutting their way through a potential market.



The market can end up in the other quadrants Q1, Q2 and Q3 but in the 'normal' evolution of a product, one would expect quadrant Q4 – or at least the right halves of Q2 and Q3 (i.e. the grey shaded area) – to contain the development path as the product's market evolves.

A central contention of this thesis is that the change in *relative* sharpness of the demand blade when set against that of the supply blade¹⁰³ that will determine the evolution of value-addedness and the PLC's shape. Where demand growth is particularly strong – implying purchasing power on the 'defensive' – the lifecycle will likely cut an upward path. Suppliers will have the upper hand; they will have an increasingly sharper blade¹⁰⁴. Where corporate pricing power is weakening relative to that of the consumer – internally due to increased competitiveness amongst industry suppliers forcing down the received unit price more than the underlying unit cost, externally due to the weakening hold that the product has on the imagination and so purchasing power of consumers

¹⁰³ The supply blade's sharpness also embodies the underlying cost structure.

¹⁰⁴ As will be explained in greater detail below, where a good has a positive price, the supply blade will *always* be 'sharper' than that of demand. Price will always be positive even if it is value destroying. This reflects absolute 'scarcity'. The discussion that follows is centred on tracking the changing *relative* sharpness between the two blades much more than their absolute sharpnesses.

– the lifecycle will cut a downward path. Now the consumers have the blade whose relative sharpness is increasing.

The relative sharpness of the two blades is determined by all those factors that go into deciding the power of the consumer versus that of the producer. For instance, the degree of concentration amongst producers will have a critical influence on pricing power: monopolists will have sharper supply blades, which is why they tend to be regarded as ‘dangerous’ by anti-trust authorities!

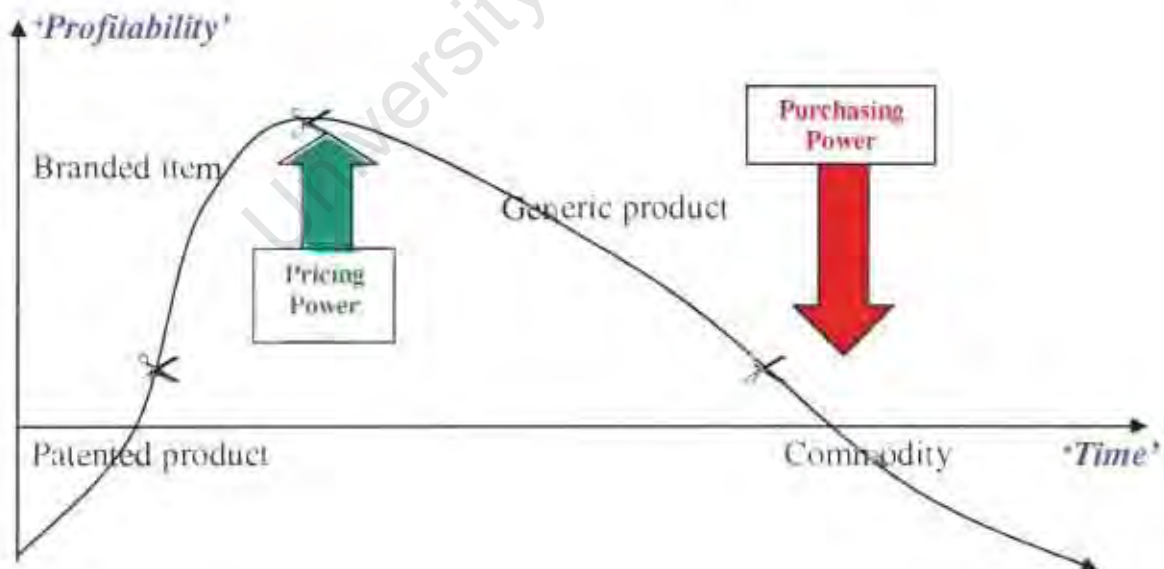
By contrast, forces capable of blunting pricing power would be availability of substitutes not just within the industry – a Wilkinson Sword razorblade rather than a Gillette one – but from another product category altogether – a De Beers’s Millennium Diamond rather than a Ford Fiesta. This latter example underlines a trait that develops as a PLC evolves – market appetite moves towards saturation as rising market penetration means a higher percentage of potential ‘adopters’ already own the product.

3 e) The PLC: Cutting a Path through Time

The PLC will be shown to represent the path cut out by the continuous intersection of supply and demand over time.

'Time' is accommodated in the x-axis. 'Profitability' is represented on the y-axis. (Exact definitions of both axes follow in section [Section 3f](#)), but for this outline portrayal of the PLC, 'time' and 'profitability' are used to describe each axis.)

The example drawn below traces a new drug going through the sequence of first being patented, then branded, then transformed into a generic before becoming as 'common as aspirin' is today. It shows how the interaction of the blades of supply and demand cut out a lifecycle path over time.



Via the PLC, this thesis will show where and when utility born of scarcity has greater influence than cost of production in the determination of value, and vice versa.

The relative 'sharpness' of both the supply and demand blades is best explained by another great contribution of Marshall to economics, elasticity. Using the *demand* variant in his core definition, he defined this as:

*The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price.*¹⁰⁵

Understanding the co-evolution of the price elasticities of both demand *and* supply, in absolute definition but more importantly *relative* to each other, is central to **Section 3**. The core proposition is that, at the start of a PLC, pricing power is much 'sharper' than purchasing power – which means producers can 'push up' demand while reducing costs more than consumers 'weigh down' on supply depressing margins. However, the rising 'sharpness' of purchasing power helps blunt pricing power in the later stages of the lifecycle: consumers force supply to give way more easily than producers are able to 'grow' demand whilst reducing costs.

Furthermore it is argued that, echoing Dietzel¹⁰⁶, at the start of the PLC, **utility born of scarcity**, a scarcity which is likely to be supplier-enhanced, is more critical in determining value-addedness but that towards the end of the lifecycle, it is the underlying unit **cost of production** that becomes more

¹⁰⁵ Marshall A., 1890

¹⁰⁶ Dietzel H. 'The value of scarcity goods is determined by utility, while the value of freely reproducible goods is determined by costs.' Quoted by Böhm-Bawerk E., 1894-95

important, not least because relative scarcity has eased. In other words, during the early stages of a product's life, given the scarcity level prevailing, the average consumer seeking satisfaction has little option but to pay up, an action that usually involves agreeing to a price that is significantly higher than the product's cost – the difference being the value-addedness representing the supplier's pricing power. Yet by the end of the lifecycle, the average consumer obtains a less scarce product from a wider variety of suppliers and is not obliged to 'pay up' for the product as much as previously. Whether the agreed price leaves room for value-addedness will largely depend on the cost structure of the seller (*including* the cost of capital that must be imputed as part of that cost structure).

Take the intensity of a consumer's appetite and the speed at which that appetite needs to be satisfied; this is but one factor that feeds into defining the nature of elasticity surrounding a consumer's demand. Alone such psychological impulses would not create value-addedness but when aggravated by scarcity and coupled with a low unit cost structure, assuming the prospective purchaser capitulates and pays up, they do.

Book publishers have long used the difference between cloth and paper as a way of separating those out with a high willingness to pay (who buy the hardback because they want the book 'now') from the rest (who wait for the paperback).¹⁰⁷

The impatient appetite behind such 'fads' is generally quenched over the first part of the PLC with the result that the psychological impulse behind '*I want it and I want it now*' declines along with relative scarcity. Not surprisingly, the

evolving price – derived from the later time period’s desire to consume a product (backed up by ability to pay) *as set against less scarce supply* – may fall in real terms, and even perhaps in nominal terms. Unless suppliers can reduce costs by an even greater amount, pricing power will fall.

From a company’s perspective, they must match their productive capacity¹⁰⁸, their cost structure, the relative level of scarcity that exists in their industry and the money-backed intensity that goes into defining the nature of demand for their product to create net value-addedness. For a monopolist, catering for demand whilst still keeping supply relatively scarce and covering costs with the eventual sale price is what gives it monopoly pricing power. But when this relative scarcity is compromised by competition’s arrival, the algorithm that defines value-addedness becomes a more complicated calculation – as airlines like British Airways who use such dynamic pricing mechanisms to calculate multiple price points within the seating structure of a single aircraft can testify.

When commoditization is reached, the waning of the strength of money-backed desire representing consumer demand, the more abundant supply of the product from multiple suppliers and the bedrock cost structure underlying production all conspire to reduce corporate pricing power to zero.

¹⁰⁷ de Long B., *Rules, New and Old, for Tomorrow’s Economy*, from his website at <http://econ161.berkeley.edu/>

¹⁰⁸ Note in the New Economy, the very concept of ‘capacity’ is falling away – an idea is infinitely reproducible and costs ‘nothing’ to store: as Greenspan also noted ‘*Concepts cannot be held as inventories*’. Speech to Congress, 27.02.02.

The essential findings herein will be as follows:

Early in the cycle, when the producer reigns all-but-supreme, supply's cutting edge is the sharper of the two blades, both absolutely and relatively. With a unit cost structure much lower than price, pricing power is correspondingly strong, translating into suppliers being able to extract significant value-added margins from the sale of each extra unit. But later in the PLC, when supply's pricing power has become relatively blunted – internally mainly by competition reducing relative scarceness and compromising the 'sale price versus underlying cost' margin, externally by the gradual saturation of consumer appetites – the sharpness of the demand side has increased in relative terms. Towards the end of the PLC, the sharpness of purchasing power has increased by so much relative to that of pricing power that the product is prone to commoditization.

In the later stages of the PLC, what limited opportunities for value-addedness remains on the side of supply are critically dependent on suppliers being able to manage effectively the only item in the equation over which they have any remaining influence – the unit cost of production – each supplier having lost effective control of their individual ability to exploit the nature of demand by manipulating the degree of scarcity.

By commoditization, the 'democracy' of demand is shown to have overthrown the 'sovereignty' of supply.

3f) Building the Economic Foundation of the PLC

The *exact shape* of the PLC is determined by the confluence of six principal factors. Each is discussed below (though nothing is implied by the order):

i. The elasticities of supply and demand – these two factors are dealt with together (Section 3h – A and B)

Feeding into these elasticities will be:

ii. The competitive environment (Section 3h – C)

iii. The cost structure underlying the industry forming the ‘bottom end’ of the pricing power margin (Section 3h – D)

iv. The possibility of regenerating the product – and technically creating a new PLC (Section 3h – E)

Underlying the lifecycle will be:

v. The influence of the capital markets in determining the cost of capital (Section 3h – F)

The overall shape of the PLC is consistent with three of the most established ‘Laws’ of Economics.

Firstly, *Diminishing Marginal Utility*: At some point, less utility is derived from the consumption of the next unit of a product than was the last. (The topical exception is the Economics of Qwerty: network externalities can mean that consumption of the next unit raises collective utility.¹⁰⁹)

¹⁰⁹ Krugman P., 1994

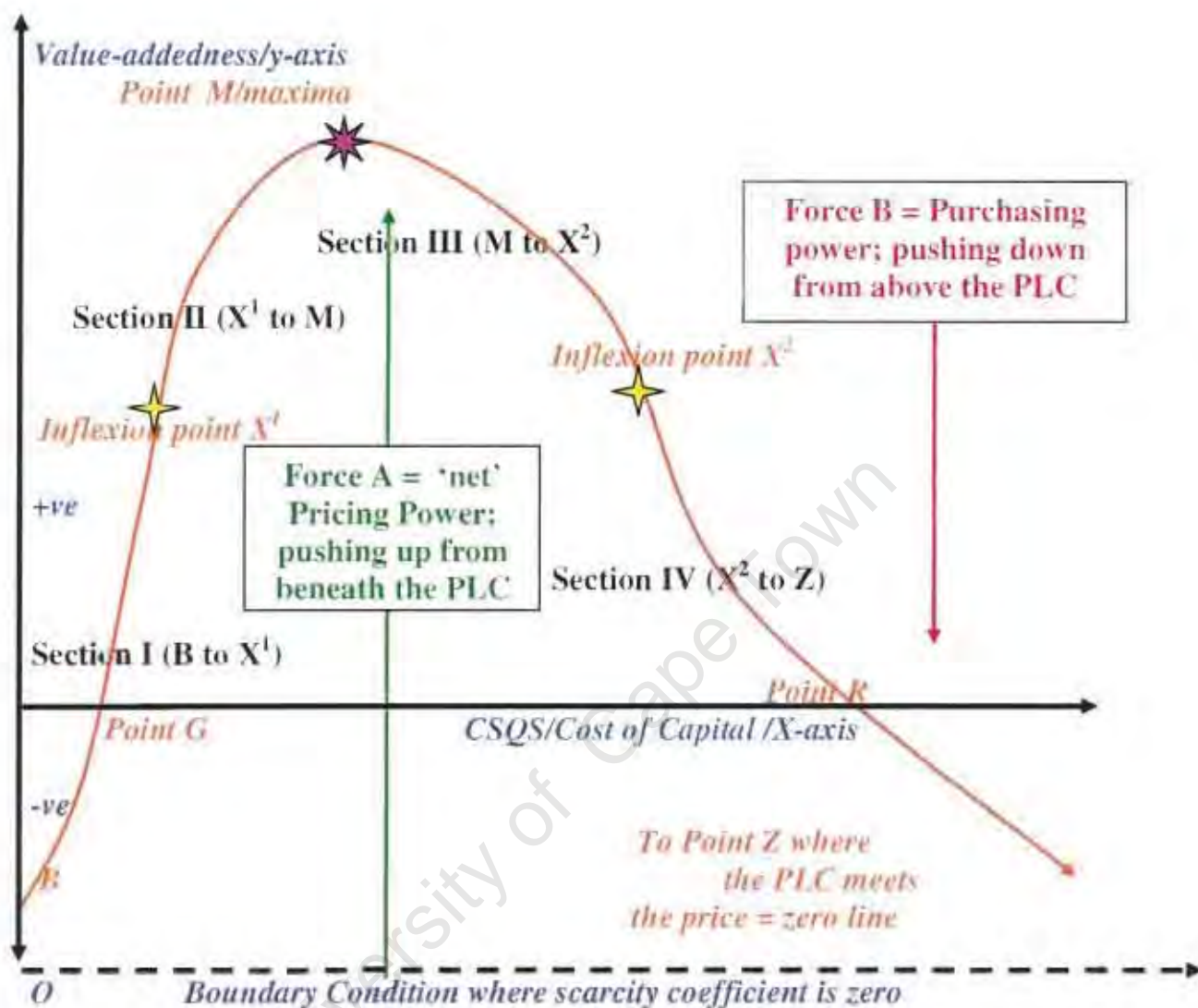
Secondly, *Economies of Scale*: After initially experiencing increasing returns to scale as output rises, and so falling marginal costs, at some point constant and then decreasing returns to scale most likely set in.

Finally, *Diminishing Returns*: At some point, the marginal addition of a further unit of capital does not raise output by the same amount.

The exact interrelatedness of these laws would be product-specific. The first law would manifest itself in the nature of the consuming market and over time shape the appetite for the product. The latter two laws would manifest themselves in the nature of the producing industry determining respectively the 'bottom end' of pricing power and the efficiency with which capital is employed in the production process.

Though accessed by demand, economies of scale are largely independent of it. Diminishing marginal utility is largely independent of supply. The Law of Diminishing Returns however 'has a foot firmly planted in both camps', measuring the market price received less the cost borne for each additional sale as against the underlying capital employed.

The 'mechanical' shape of the PLC is now described as a foundation to the more detailed discussions that follow.



1. The PLC drawn shows evolution of net value-addedness generated for every extra sale achieved over a product's life. The above example is the central 'shape' employed in this thesis; a particular PLC would likely be a variant of the above.

The Axes

2. The main x-axis shows **both** the Cumulative Sequential Quantity of product units Sold (CSQS) **and** the Cost of Capital. The y-axis captures the true profit

margin of a product. By deduction, **the y-axis is a measure of net value-addedness, positive when it is above the x-axis, negative when below.** There is a boundary condition in the negative value-added ('value destroyed') half of the diagram that defines where the scarcity coefficient is zero¹¹⁰; any point above this boundary condition implies a positive price.

The Origin

3. The origin signifies when the lifecycle 'starts' and as such is a point in time;

The Main Points on the Curve

4. The PLC begins at B, the point of 'Birth'. It rises to Maxima M, the point of 'life best', before falling back through R and beyond. R is the point of 'Retirement' beyond which, for the marginal unit produced, the financial cost of capital involved in producing that unit is no longer covered by the returns being generated. R is therefore the point of commoditization, and signals the end of the value-creating part of the PLC that began when it crossed the x-axis at G, the point of Graduation. The PLC ends at point Z where the *price* is Zero (where the product 'dies').

5. Between B and M, the PLC passes through inflexion point X¹, and between M and Z, through inflexion point X².

¹¹⁰ Products with prices but negative scarcity coefficients are possible but much rarer; this issue is covered above in [Section 2\(d\)](#); the focus here is on the near universal norm of goods with positive scarcity

The two primary forces at work within the PLC curve

6. Force A represents aggregate Corporate Pricing Power; Force B represents aggregate Consumer Purchasing Power. While the product can achieve any price above zero, *Force A is always larger than Force B*: absolute pricing power is always greater than absolute purchasing power where the scarcity coefficient is positive¹¹¹. *Competition is such an important dimension of Force A that it will be dealt with separately. Suffice it to say that it is a drag on Force A, pulling it down from within as the PLC evolves.*

7. So far as suppliers can determine Pricing Power within a PLC, it is derived from two main decisions over which they have influence. **Firstly**, the ability to select, assuming a downward sloping demand curve, either what price to sell output or how much to sell – but *not* both. This option usually becomes more restricted as the PLC ages as suppliers become price-takers more than price-makers thus forestalling their options in deciding supply levels. **Secondly**, suppliers can usually take advantage of a downward sloping average cost curve, allowing them to access the beneficial influences of ‘volume gearing’. If a supplier can re-engineer the shape of his own average cost curve, in particular by using new production technology or more efficient management techniques, this would allow that supplier to extend the period of time when this curve remained downward sloping.

In using value-added and not price as the unit being measured on the Y-axis, it is important to understand the evolution of the average cost curve over the

coefficients

¹¹¹ But see [Section 3i](#) below; if the prism of the opportunity cost of capital is superimposed on this comment and the option exists to switch the capital employed to another use, this observation need not hold in *relative* terms, only in *absolute* ones.

PLC. (See Section 3h – D) As with all overheads, as output rises, the fixed cost per unit falls; furthermore as with all fixed costs, they can become variable over time. Even the capital charge is variable to a degree (see Section 3h – F); for example, capital repayments to shareholders would reduce it.

The area contained within the PLC curve

8. The area under the curve is projected in net present value terms; all future profit margins are discounted by the cost of capital. This is because the x-axis **also** represents the opportunity cost of capital. The total area under the curve is the aggregate of all value-added generated over the lifecycle of the product and is displayed on an equal area basis. (If the PLC is 'under' the x-axis but contained, then net value-added is negative and so being destroyed, not created.)

The assumption of viability

9. It is assumed that the industry making the product can always cover its cash costs. **This may not mean being value accretive in the net value-added sense.** (A weaker assumption could be that, were the product loss-making, the industry would be able to return to a position of being cashflow positive. If it cannot, the implication is that at least some companies in the industry must, once external borrowings have been exhausted, declare bankruptcy and go out of business.)

The Three Phases of the PLC's slope

10. There are three distinct phases to the PLC's slope though none of them compromise one overriding characteristic: that the scarcity coefficient is always positive so absolute pricing power is **always** stronger than absolute purchasing power. The three phases are:

A rising gradient from B (via G) to M: the rate of change in (Upward) Force A is greater than the rate of change in (Downward) Force B.

A zero gradient at its maxima M: the rate of change in Force A equals the rate of change in Force B.

A falling gradient from M to R and beyond to Z: the rate of change in Force A is less than the rate of change in Force B.

As will be shown below, these three gradients can be seen as representing the 'elasticity' of the PLC, ϕ . The formula derived will show that when the PLC's 'elasticity' is positive, pricing power is rising relative to purchasing power; when zero, that neither are in the ascendant; when negative, that purchasing power will be gaining on pricing power.

Gradients over the whole curve

11. The gradient of the PLC accelerates at an increasing rate from Point B to the first inflexion point X^1 , thereafter accelerates at a decreasing rate from X^1 to maxima M. From M the gradient is negative; it is decelerating at an increasing

rate from M through to the second inflexion point, X^2 and thereafter decelerating at a slower rate through R and beyond to Z.

The four sections of the value creating part of the typical PLC curve

12. Assuming this 'normal' version of the PLC, there are four distinct sections over which value is being created *for at least some portion of the curve*.

Section I: Between B and X^1 – convex to the x-axis where above it

Section II: Between X^1 and M – concave to the x-axis

Section III: Between M and X^2 – concave to the x-axis

Section IV: Between X^2 and Z – convex to the x-axis where above it

The Starting Point

13. Point B, notwithstanding its negative value-addedness, incorporates the positive price achieved for the product's first sale. Since unit revenues are below total costs (which, for the first sale, equals unit cost) *including* a cost of capital unit charge, the addition to value-addedness is negative; value is 'destroyed'. Value-addedness becomes positive at Point G, the point of 'Graduation', where total revenues for the first time exceed total costs, including a charge for the financial value of capital employed. Accumulated net value-addedness only becomes positive (which is to say that the investment in the product has been justified by the returns) if and when the value destroyed between time O and time G is recouped thereafter.

The First Section

14. The first section of the curve, Section I, is where Force A (pricing power) is growing at a faster rate than the growth in the opposing Force B (purchasing power). In economic terms, during this section the price elasticity of demand is moving away from zero at a faster rate than the price elasticity of supply is also moving away from zero. One possible explanation for this is that a monopolist starts to exercise monopoly pricing power and raise prices (or at least margins) but notwithstanding this, innate demand for the product grows even more. As will be detailed below, the drag of competition is felt only once monopoly has been (or seems likely to be) compromised.

The First Inflexion Point

15. The first of two continuous inflexion points, X^1 , is reached when the influence of Force B *visually* starts to limit the upward drive of Force A. It also marks the point where the rate at which elasticity of demand is moving away from the absolute value of that of supply at its greatest rate. Hereafter the rates of acceleration again start to converge until the rates equal each other at the maxima, M. After X^1 , the supplier (or if monopoly has been compromised, suppliers) will continue to raise margins, if not prices. Innate demand is likely to continue growing but demand's innate rate of growth is henceforth checked to an *increasing degree* by consumer reaction to higher prices.

The Second Stage

16. Section II is where (together with competitive influences considered separately below) consumer resistance starts to slow the upward movement of

force A. For this section of the PLC, the rate of growth of the elasticity of supply will still be less than that of demand but by the next discreet time period, the gap between the two rates will have closed.

The High Point

17. Section II ends with maxima M. This is the point where the power of Force A exceeds that of Force B by its maximum amount. However at M the rate of increase in the strength of Force A now equals the rate of increase in the strength of Force B. To put this differently, the rate of growth of price elasticity of supply¹¹² – the cutting edge of Force A – has now caught up with and is equal to the rate of growth of the price elasticity of demand – the cutting edge of Force B. After M, the tide – as measured by marginal value-addedness – starts to turn in favour of consumers and against suppliers.

Given the observation that the derivation of the PLC can be reconciled to the equation 'MR – MC' (where MC excludes interest costs but includes a per unit measure for tax and cost of capital), the High Point M occurs where what has been called the 'Absolute Elasticities' of MC and MR are equal, that is to say their slopes are the same.

The Third Section

18. Section III is where Force B first *starts* to peg back the overall strength of Force A. For the first time in the PLC, the rate of acceleration of Force A now

¹¹² Though unlikely, it is just conceivable that the kink in the supply curve is starting to make itself felt, even if it is unlikely to be revealed over the operational range. The influence is most likely to manifest itself first through the need to maintain a given level of market share. Though not strictly related, high market share at this stage is likely to achieve – *en passant* – high capacity utilization.

exceeds the rate of acceleration of Force B with both forces theoretically heading towards meeting each other (ignoring their positive and negative signs) in infinity. Consumers are starting to 'win' in their tussle with producers.

The Second Inflexion Point

19. Section III ends with inflexion point, X^2 . Deep-seated changes in the supplying industry (detailed below) may begin at – or even in anticipation of – point X^2 and start to affect the nature of the market for the product, continuing to do so for the remainder of the PLC curve. The forces of demand will continue to weigh down on those of supply but the rate of erosion of pricing power would start to decline after point X^2 whereas up until point X^2 , this erosion rate would have been increasing. After X^2 , elasticity of supply would be catching up on elasticity of demand at a slower rate.

The Fourth Section

20. The final *value-creating* part of this 'normal' PLC, contained within Section IV, begins with inflexion point X^2 and ends at R when the product 'retires' in terms of value creation. But section IV itself continues beyond Point R until the product 'dies' at Point Z. *Section IV is critical in terms of this thesis, as it is likely¹¹³ to contain within it Point R, the point of retirement or 'commoditization'*.

¹¹³ Though not certain; commoditization could have occurred in Section III – indeed if the product never covered its cost of capital (certain internet start-ups?), it would have been 'commoditized' even as the PLC started!

The Twilight Zone¹¹⁴

21. Once the PLC has passed point **R**, *if* information flows remain sufficiently good and markets reasonably efficient, the product will stumble towards its death. In this portrayal, it is also assumed that the PLC never again rises up above the x-axis beyond **R**. (In practice this does not always happen; this is covered below in Section 3h – F) under ‘cyclicality’.)

The changing nature of demand and supply elasticity over the PLC

22. The interaction of elasticity of demand with that of supply (assuming elasticity of supply on *the upper extension from the price point of the supply curve*: see Section 3h) – A and B) for downside qualifications) can be summarised as follows:

Overriding assumption: between 0 and ∞ , the absolute value of elasticity of supply is always less than that of demand where the scarcity coefficient is greater than zero. (This ‘rule’ may be technically violated where the supply curve is kinked, but it would nearly always reassert itself immediately the supply/demand equation settled down again at a (sharply) lower price.)

	Elasticity of Demand (E of D)	Elasticity of Supply (E of S)
At Point B	Zero in value and so ‘equals’ E of S	Zero in value and so ‘equals’ E of D
During Section 1	Rate of growth away from zero is greater and accelerating compared to that of E of S	Rate of growth and of acceleration away from zero is less than that of E of D

¹¹⁴ The Twilight Zone is a concept developed in detail in Section 11) below)

At Point X ¹	Rate of acceleration away from zero is greater but no longer accelerating compared to that of E of S	Rate of acceleration away from zero is equal to that of E of D, but overall rate of growth is still less
During Section II	Rate of growth away from zero is greater but now decelerating relative to that of E of S	Rate of acceleration is now rising towards that of E of D, but overall rate of growth is still less
At Point M	Rate of growth towards ∞ equals that of E of S	Rate of growth towards ∞ equals that of E of D
During Section III	Rate of growth towards ∞ is less than that of E of S and the gap between the two is closing at an accelerating rate	Rate of acceleration towards ∞ is greater than that of E of D and the gap between the two is closing at an accelerating rate
At Point X ²	Rate of growth towards ∞ is less than that of E of S and the gap between the two is closing at an equal rate	Rate of growth towards ∞ is greater than that of E of D and the gap between the two is closing at an equal rate
During Section IV	Rate of growth towards ∞ is less than that of E of S but the gap between the two is closing at a slower rate	Rate of growth towards ∞ is greater than that of E of S but the gap between the two is closing at a slower rate
At point Z	= E of S and is ' ∞ ' in value	= E of D and is ' ∞ ' in value

3 g) The 'Six Rounds' of the PLC and the Evolving Nature of Competition

Kuznets's lifecycle had three stages – launch, maturity and decline. The PLC variant used herein – notably in the micro case studies in [Section 5](#) – has expanded these three stages to six, or as they will be called, 'Rounds'. Whilst these six Rounds are not *precisely* derived from Kuznets' three stages, links between them remain strong.

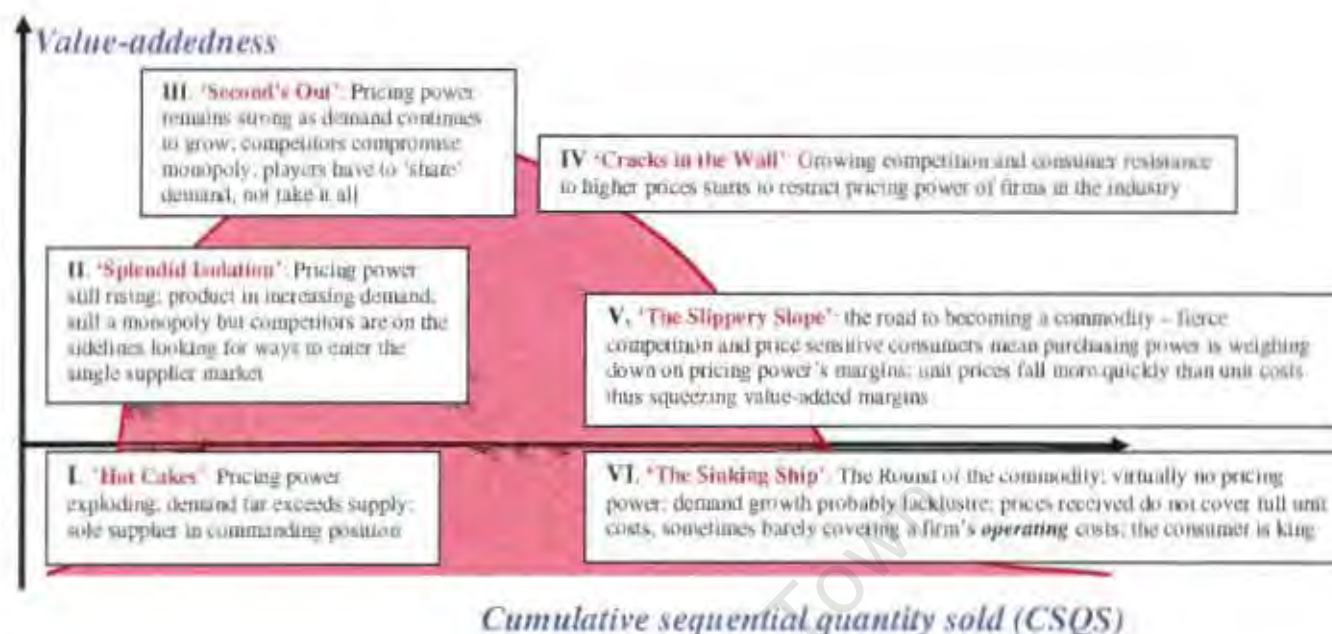
The nature of the competition prevailing in the supplying industry is the principal mechanism employed to delineate each Round.

Rounds I and II describe the monopoly conditions underlying the beginning of the PLC – they are dubbed *Hot Cakes* and *Splendid Isolation* respectively, roughly being equivalent to Kuznets' Launch Stage.

Rounds III, IV and V describe oligopolistic conditions underlying the middle of the PLC – they are dubbed *Second's Out*, *Cracks in the Wall*, and the *Slippery Slope* respectively. They are roughly equivalent to Kuznets' Maturity Stage though Decline is obvious by Round V.

Round VI, whilst still oligopolistic, describes the 'aging lines' that foretell the encroachment of the unattainable world of perfect competition; it is dubbed the *Sinking Ship* Round and would be included in Kuznets' Decline Stage.

In broad terms, these six rounds can be diagrammatically summarised thus:



The above diagram – a stylised representation of the norm – is explored through [Section 5](#)'s case studies. It cannot be taken as a universal prescription as it is, for instance, possible that a product never became value adding in its life, that it was *'born a cold cake in a sinking ship'* even if it was only ever produced by one supplier. Such would be the description of a Broadway show that 'flopped' after only one night.

Monopoly and oligopoly are divided between Round II and III. Oligopoly characterised by *'still sufficient scarcity for value to be created'* versus the oligopoly in the 'Paddock of Abundance' separates Round V from Round VI.

Divisions between Round I and II, between Round III and IV and between Round IV and V (such divisions being *within* given forms of industrial organization) require alternative explanations. These divisions are examined in particular in [Section 3h – F](#) when the role that the capital markets play in determining the shape of the PLC – by influencing the cost of capital – is

covered. The stockmarket is a useful arbiter of these distinctions, focussing (mainly) on a company's growth characteristics and reflecting its opinion in a company's share rating.

For now the essential differences can be summarised as follows:

Between Round I (Hot Cakes) and Round II (Splendid Isolation)

Round I would be epitomised by monopolies that are not yet profitable but are still trying to prove themselves; Round II deals exclusively with value-creating monopolies.

Between Round III (Second's Out) and Round IV (Cracks in the Wall)

This describes companies on the cusp of going ex-growth; in stockmarket terms, this happens when a 'growth' stock with an above average rating becomes a 'value' stock with an average market rating.

Between Round IV (Cracks in the Wall) and Round V (Slippery Slope)

This describes companies that go from being a 'value' stock with an average market rating to a 'cyclical' with a below average market rating and the looming prospects of becoming commoditized.

3h) The six main influences that shape the PLC¹¹⁵

We now examine in detail the evolutionary process that shapes the PLC over its six Rounds. In **Section 5**, the six main factors that are identified as going into the shaping of the PLC – producer pricing power, consumer purchasing power, the competitive environment, the underlying cost structure, the ability to regenerate the product and the perception of the capital markets – are discussed in the context of six companies, each typifying one Round of the PLC. Here those shaping influences are discussed with reference to microeconomic theory.

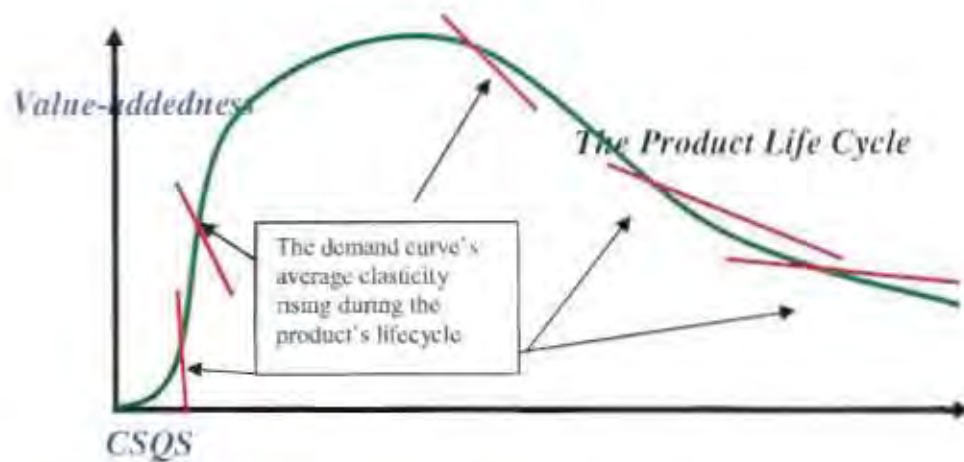
3h – A and B) Purchasing Power and the Elasticity of Demand as set against Pricing Power and the Elasticity of Supply

- i. *A dynamic portrayal of the evolution of the elasticities of the demand and supply curves over the full course of PLC*

Evolution of the Elasticity of Demand

As consumer power increases, it weighs down on the price elasticity of demand causing it to rise, as represented by a flattening demand curve. Herein this progression is called 'falling on its back'. This means more of the demand curve becomes elastic and the point of unitary elasticity moves along the curve. (n.b. The important observation to make below is that the **angle** of each demand curve where it crosses the PLC reflects its changing elasticity.)

¹¹⁵ This section relies heavily upon Baye M., 1996; Shy O., 1995; Varian H., 1999; Lipsey R.G. and Chrystal K.A., 1995; Koutsoyiannis A., 1979



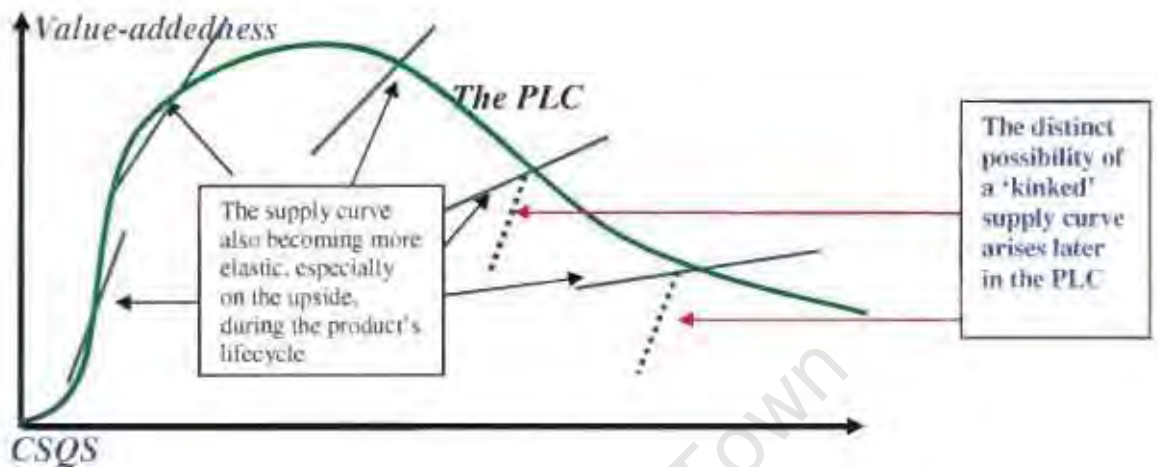
Evolution of the Elasticity of Supply

As the PLC progresses, the supply curve tends to 'lean forward', the most important reason behind this being that as the number of competitors increase, so will *potential* supply capacity.

However there is one extremely important aspect of this characterisation that will be covered in detail below: essentially it is the *upper extension of the supply curve from the price/quantity point that becomes very elastic* (and leans forward) whereas the *downside* – especially where firms aim at minimum levels of capacity utilization *almost* regardless of the received price – *can, and often does, remain very inelastic* (and so remain more upright).

This development has particularly important implications for price and, as the PLC progresses, pricing power. Especially later in the PLC, when a product's demand growth pattern starts to correlate more closely with the ebb and flow of the economy – become 'cyclical' – the supply curve may become 'kinked'

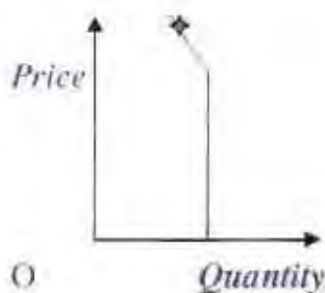
around the pre-slow down price point. This possibility is examined in greater detail below in part *iii* of this section.



The evolution of the elasticities of the demand and supply curves.

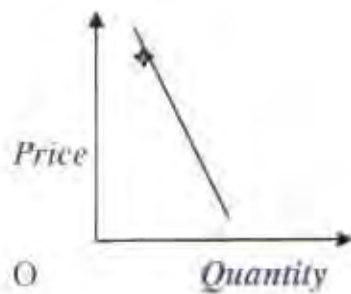
The Elasticity of Demand, Round-by-Round

Over the course of the PLC, the industry's elasticity of demand gradually 'falls on its back' from being upright and perfectly inelastic to being, in extremis, close to horizontal and perfectly elastic. In particular it is important to note how the point of unitary elasticity changes over the six Rounds of the PLC. **N.b. normal price/cost vs. quantity chart curve used here; the focus is on the 'operational range' where demand and supply would be likely to intersect.**



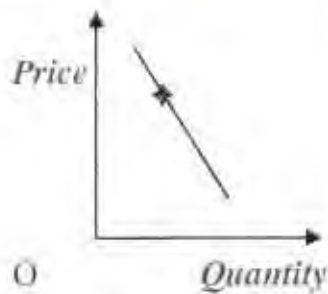
Stage 1: 'Hot Cakes'

Demand is near perfectly inelastic over the operational range. Unitary elasticity (= \diamond) - if it can be said to exist as it is not accessed by the market - would be somewhere above the top of the kink.



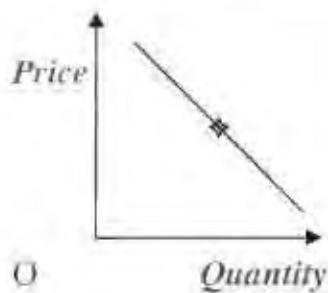
Stage 2: 'Splendid Isolation'

Demand is inelastic over nearly all of its operational range. Unitary elasticity would be somewhere near the top of the curve, and firms would aim to operate on or above this point.



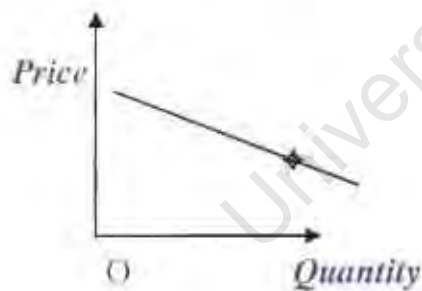
Stage 3: 'Second's Out'

Demand is inelastic over most of its operational range. Unitary elasticity would be moving towards the middle of the range. *Price* may be rising, moving sideways or even falling depending on the outward movement of the demand curve as the PLC evolves. However quantity would almost certainly only be rising.



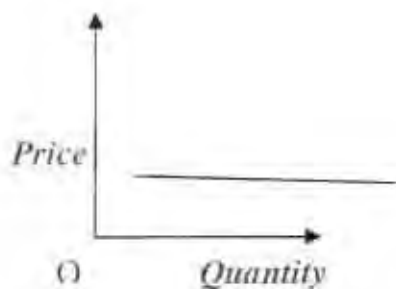
Stage 4: 'Cracks in the Wall'

Demand is inelastic over perhaps half of its operational range. Unitary elasticity would be moving towards the middle of the range, and perhaps beyond. Because competition would almost certainly be getting fiercer, quantity would most likely be rising. Prices could quite possibly be falling if not in real then at least in nominal terms.



Stage 5: 'The Slippery Slope'

Demand is now elastic over most of the operational range. Unitary elasticity would be moving towards the lower end of the demand curve. By now, competition would be close to 'no holds barred.' Quantity would most likely still be rising. Prices will quite possibly be falling even in nominal terms.

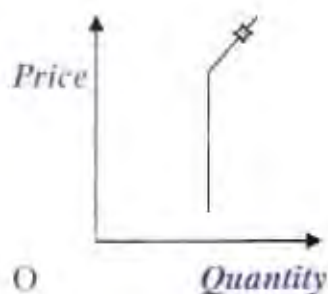


Stage 6: 'The Sinking Ship'

In practice, demand is very elastic over all of its operational range. Unitary elasticity would probably still exist only at very high volumes. Competition would be cutthroat. Quantity sold could be rising but largely only when consumers wanted more as firms would be at the market's price-taking mercy by this stage. And nominal prices would more often than not be falling, though occasional late cycle demand surges could see this trend temporarily reversed.

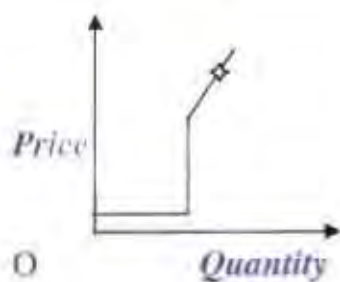
The Elasticity of Supply, Round-by-Round

The same exercise can be carried out showing the evolution of the supply curve over the PLC – where it gradually leans forward until, *at least on its upside*, it is eventually near horizontal and so almost perfectly elastic.



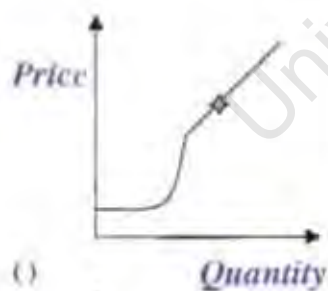
Stage 1: 'Hot Cakes'

As a sole supplier at this stage, a monopolist can choose, and often does, to make supply inelastic. Installed capacity of the only supplier heavily limits market supply. Elasticity is inelastic over most of the operational range of the supply curve.



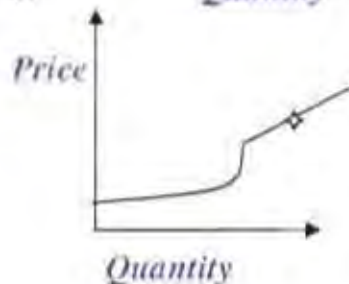
Stage 2: 'Splendid Isolation'

The monopolist still has the option of being non-cooperative and only supplying the market some of what it wants. (The likelihood of 'demand collapsing' below the kink, and the sole supplier being forced to give way on price, would be regarded as remote.) The prospect of competition means that the monopolist must be wary of abusing market position; supply inelasticity over the operational range may be falling as capacity is added.



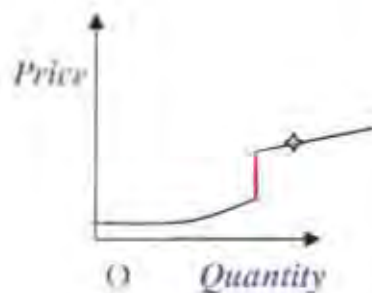
Stage 3: 'Second's Out'

The arrival of a second supplier fundamentally alters the nature of supply and so its elasticity. The industry supply curve is becoming more elastic over the operational range as both suppliers try to build volume. The original supplier will usually try to protect market share. Either way output capacity would most likely be rising. Both competitors must also be wary of yet further new entrants and will often add extra supply as a deterrent. The likelihood of 'demand collapsing' below the kink, and both suppliers being forced to give way on price, while remote, is not impossible. Any scramble for market share would most likely precipitate a ruinous price war.



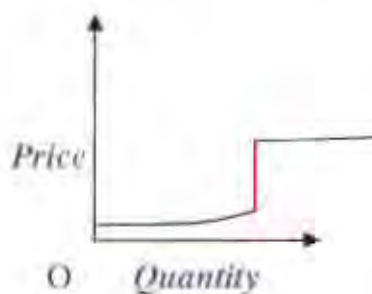
Stage 4: 'Cracks in the Wall'

Competition will by now be in earnest and suppliers will be wooing customers quite possibly through aggressive price competition. Market appetite will continue to rise but its growth rate may be cooling. This combination only reinforces the idea of rising industry supply elasticity over the operational range. If demand growth were to stall, the prospects of a ruinous price war (as it could lead to losses, even bankruptcy, for the weak) emerge.



Stage 5: 'The Slippery Slope'

A conceivably ex-growth product and a bevy of new (often low cost) suppliers will put the industry as a whole on its back foot so far as its 'battle' over pricing is concerned. The low cost objective that probably every supplier would be pursuing will further undermine 'order' and further increase output and so supply elasticity. Surplus capacity will be increasingly common, the product's demand schedule increasingly cyclical. *Where minimum capacity utilization targets exist for individual firms, their supply curves may be inelastic on the downside, a fact that may have knock-on implications for the shape of the industry supply curve on the downside too.*



Stage 6: 'The Staking Ship'

Supply would be near perfectly elastic by this stage with little or no market discipline and most likely surplus capacity at all stages of the economic cycle. Any hints of pricing power would be quickly overwhelmed by the release of contingently issuable supply. *As minimum capacity utilization targets will generally exist for all firms, their supply curves are very likely to be inelastic on the downside at these capacity utilization levels, a fact that will have knock-on implications for the shape of the industry supply curve on the downside too.*

iii. The kinked supply curve in the later stages of the PLC.

As the PLC ages and the industry producing a given product matures, the organisational structure characterising that industry likely moves towards being highly competitive. Of all the traits facing this environment, perhaps none is more corrosive in undermining the PLC's durability as surplus capacity, in that it has the potential to compromise the scarcity of supply.

The harsh mechanics of corporate *survival* – even ahead of those needed to be value adding – require a company first to cover its cash costs¹¹⁶. Whereas periodic shortfalls in working capital can be covered through debt borrowings

¹¹⁶ This issue is covered separately in [Section 11e\) The Corporate Plimsoll Line – Drowning by Degree](#). Suffice it to say here that price is a 'negotiable' concept when dealing the need to meet a certain financial target – be it to make a true profit, simply an accounting profit, or merely to make a contribution towards fixed costs. Separately there may be an objective – alone or in combination with one of the three 'profit' achieving/loss avoiding aims mentioned here – to be cashflow positive.

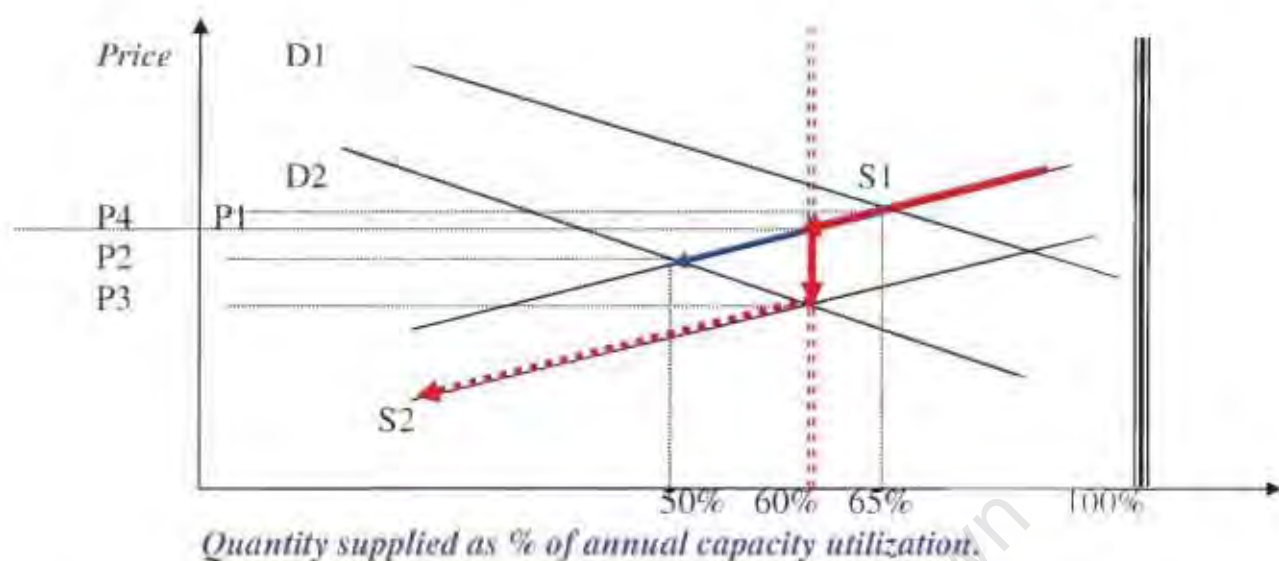
(and conceivably raising new equity), where such a shortfall become chronic and permanent, an individual firm's survival would be at stake.

There arises a cash amount, peculiar to each firm, as to an estimated base level of revenue that is needed to cover 'essential' costs. This level of minimum income is derived from a level of capacity utilization – usually worked out on a base case, low price – that must be met for such a break-even to be achieved.

There is a second metric at work that biases capacity utilization towards being as high as is 'reasonably' possible: the higher the utilization, the lower the marginal cost and therefore – if some market segmentation is possible – the underlying assumption of breakeven capacity utilization being achieved at a uniform price can be relaxed.

When one adds in the 'other' imperative of making profits (and it is distinctly possible that within the same industry there are both firms pursuing the 'necessity' of survival and the 'luxury' of making profits), this further adds to the near ever-present bias to produce more units, theoretically up to the level where marginal cost equals marginal revenue, especially for the industry's most efficient players. This latter scenario may only occur when smaller players are not truly profitable in the sense of covering not just their cash running costs but their imputed capital costs as well.

Assume an industry breaks even at 60% capacity utilization (and *initially* assume that each firm in that industry has the same 60% requirement; this latter assumption is relaxed below.) The following supply/demand schedule could arise, with the x-axis recording industry capacity utilization:



The scenario begins at D1/S1 where price is P1 and annual capacity utilization a 'satisfactory' 65%. Assume as a result of economic slowdown, annual demand falls from D1 to D2, suggesting a new equilibrium at P2. At 50% capacity utilization, this would be *below* the required 60%. The industry would not accept this and would drop prices even further, to P3, thus stimulating additional demand and achieving the 60% minimum utilization. This creates a kinked supply curve – which over the price range P4 to P3 is perfectly elastic – at the 60% utilization level, outlined above in **red**.

Now assume two further developments.

1. Assume that P3 is the lowest price that the industry can go at a 60% level of output to achieve breakeven. What happens if the cyclical downturn saw demand fall *even lower than D2*? The simple answer is that the industry *as a whole* must go into loss. Here survival of the fittest comes into the equation: fitter players tend to give up price in an attempt to hold market share. This response makes the weaker players suffer doubly – their received price will be

even lower as most likely will be their market share. *Very fit players may actually remain profitable at the expense of their rivals making losses.*

This is the scenario currently being played out by Dell in the PC market.

Faced with a softening PC market in the US, Dell has declared its intention to gain market share 'profitably' in the shrinking market by cutting its computer prices by an average of 20%. One analyst suggests that Dell may be prepared to push operating profits down from 8% to 3.5%, a level which if matched by rivals would push them all into the red.¹¹⁷

If the actions of a Dell imply losses for some, it is by no means an automatic assumption that loss-making firms would cut back on their output. Their counterargument generally centres on the idea that *'we would rather incur temporary losses arising from these lower prices than concede market share which, when demand recovers, might be extremely difficult to win back.'* This reasoning further reinforces the bias noted throughout this section to keep production high: most operators would probably choose to produce and sell more at a forecasted lower price rather than produce less and hope to sell it at a higher price, *especially when another supplier with spare capacity might pick up any sale foregone at the original starting price.*

2. Now relax the (unrealistic) assumption of a uniform 60% minimum capacity utilization requirement. The likelihood is that an industry at this stage of its PLC would be made up of firms of various sizes (in terms of their maximum achievable output) with each having different minimum capacity utilization

¹¹⁷ Don Young *UBS Warburgs*, quoted in the Financial Times, 8.5.2001

targets. Even where concentration is high in a mature industry, there will almost certainly be smaller players operating at the fringes, sometimes through the medium of imports.

The general rule would be the larger the size of a company (measured by capacity and assuming constant technology) relative to its industry, the smaller its likely minimum capacity utilization target. This is because the base market share a larger firm could achieve would translate into bigger economies of scale – thus underlining the connection between market share, economies of scale and breakeven capacity utilization. The opposite would be true for smaller players – higher capacity utilization would generally be required to breakeven.

Herein lies the root of the corrosiveness of surplus capacity. Smaller players will, if competing head on with industry giants, only really compete at the margin on price (high quality, high price, niche operators can be players too, though it is difficult for late entrants to pursue this strategy). The lower price they offer hopefully turns into higher demand allowing them to fulfil their own capacity utilization targets.

This is the world of '*judo economics*'¹¹⁸. A small player entering (or already in) a market is ceded the 'scraps' by the dominant player (or players). For the larger incumbents to respond by matching lower prices is not to their advantage: aggregate foregone value-added margins available from customers that would have remained loyal is not compensated by margins secured by lowering prices for *everyone* in shoring up loyalty of possible defectors to the gadfly.

For this ‘ceding the scraps’ strategy to work, incumbents must draw highly visible ‘lines in the sand’ and threaten to fight the gadfly if those lines are crossed. This situation tends to lead to an uneasy, unstable truce and does not normally resolve the conflict indefinitely. For instance, if one gadfly ‘pushes his luck too far’ forcing the incumbent to respond, a fight for market share can erupt. If another gadfly enters the market, how do the existing players accommodate this new arrival? In practice, the second gadfly probably puts most pressure (at least initially) on the *existing* gadfly but the resulting fall-out often breaks the uneasy truce for all.

One industry that typifies this problem is the US airline business, one dominated by a complex algorithm that centres on the concept of achieving a determinable level of capacity utilization or ‘load factor’. The US domestic air-travel market is a highly concentrated industry trying to defend itself from ‘fly-by-night’ operators like South Western Airlines. Margin corrosion is spreading throughout the US domestic network. Large incumbents – using mechanisms like frequent flyer loyalty programmes to shore up existing client bases – have to decide between ‘accommodation’ and ‘playing tough’. Both strategies are possible *in a growing market*, but ‘reluctant accommodation’ is *generally* the better option in terms of achieving the best value-added results. (In Europe, British Airways set up its own gadfly, *Go*, to deter entry from new gadflies and keep existing ones ‘at bay’. British Airways has sold *Go*; the jury is out as to whether this helped British Airways or conceivably made matters worse.)¹¹⁹

¹¹⁸ Originally developed by Gelman J. and Salop S., 1983; this section relies heavily on the on-line class notes of Dessein W., Professor of Economics at the University of Chicago Business School. <http://gsbwww.uchicago.edu/fac/wouter.dessein/teaching/commitment.pdf>.

¹¹⁹ *Ft.com*, 6.8.2001

The crunch comes when growth slows, perhaps turning negative during an economic downturn.¹²⁰ US air travel, having grown during much of the 1990s at an annual rate of 5% – faster than the GDP growth – has slowed to a rate lower than GDP in 8 of the prior 15 quarters to end June, 2001; to cap this, in the year to May 2001, it contracted by 2%. United Airlines is backing out of its merger with US Airways and has had to cut dividends by 84% having fallen into loss during the first quarter of 2001. Of the main US Airlines, only South Western and Continental remain in ‘profit’¹²¹.

In softer markets, industry gadflies can inflict great damage on the market leaders, usually forcing them to react. Low cost heavyweights – such as Dell – will often not stand still retaliating (in Dell’s case, pre-emptively) in a highly visible way, most likely with a price war that becomes a contest of ‘*how much pain can other suppliers endure before crying enough*’.

What develops is a potentially deadly game of ‘chicken’: who will capitulate first and start to take the necessary but self-defeating step of reducing output? Capitulation generally happens when big losses loom: Ford, after announcing sharply lower profits for the first quarter of 2001¹²² and with the market expecting much lower third quarter earnings¹²³, has announced that output in the third quarter of 2001 will be 10% lower than the equivalent quarter in 2000.¹²⁴ This action was necessary given a ‘*slowing market propped up by*

¹²⁰ This section was deliberately *not* updated as a result of the tragic events of 11.9.2001, even though they were to expose quite how precarious the airline business has become.

¹²¹ *The Economist*, 7.7.2001; the situation has of course worsened considerably since as a result of the events of 11.9.2001.

¹²² *Financial Times*, 20.4.2001

¹²³ Analyst Report at jpmorgan.com

¹²⁴ *New York Times*, 13.6.2001

ever-growing cash rebates, cheap loans and low-priced leases' ¹²⁵(that is to say lower prices!).

Manufacturing firms in mature industries usually have their own individual levels of required minimum capacity utilization. Unless each firm is covering their targets – where '*there is enough demand to go round for everyone*' – there is usually instability, which manifests itself in one or more companies trying to increase output through lowering prices.

And even if there were enough demand to go round for every firm to cover their minimum capacity utilization targets, instability can still arise from intrafirm competition for the limited profit pie that would be available.

From Reserve Price to Reserve Capacity

What emerges later in the PLC is the need for individual firms – and by aggregation the industry – to achieve a 'reserve capacity' level. This concept had a corollary at the beginning of the PLC, where it was a 'reserve price'.

This 'mirror image' similarity extends into the consequences for the elasticity of supply. If bids to buy an original share allocation for a fixed price IPO¹²⁶ matched the number of shares on offer, they would all be sold at the same price: for that single price – the reserve price – and the defined quantity, the supply curve is 'perfectly elastic'. But below that reserve price, supply would be perfectly inelastic as there would be none!

¹²⁵ *New York Times*, 13.6.2001

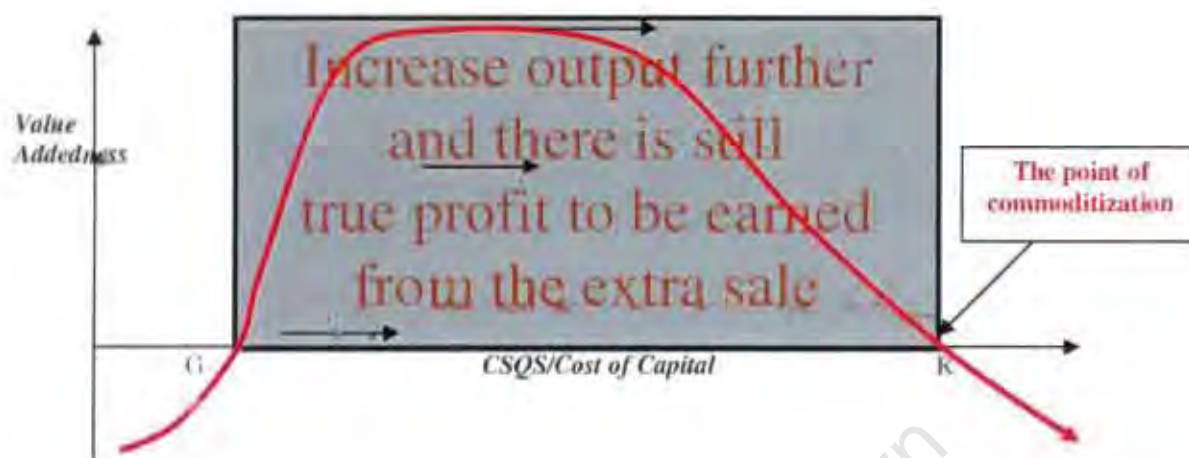
¹²⁶ For example, see the VA Linux Systems IPO profiled in the 'Hot Cakes' **Round I** below

The source of the 'power' in pricing power underlies both these contrasting situations – it revolves around the freedom that a supplier has to say 'no'. If the reserve price in an IPO is not met, the seller says 'no' to a lower price, the implication being that the item being sold is more valuable to the seller than the price being offered by the market. By the later stages of the PLC, the 'freedom' of suppliers to say 'no' is heavily circumscribed. Far from being faced with the relative luxury of being able to set a reserve price, they are now faced with a near-absolute necessity of achieving a reserve quantity, if needs be by giving away margin. It is not hard to see who has the real market power in the latter scenario: this time the consumers are saying '*take it or leave it*'.

When a monopolist sets not a reserve price but a level of supply and takes whatever derived level of demand results, he does so from a position of strength. Yet when a firm late in a product's lifecycle is obliged to do the same – set a level of capacity utilization and take whatever price results from the ensuing level of supply – it does so from a position of weakness.

There is a deeper consequence of this wholly understandable behaviour by individual firms. What the need to meet a minimum capacity utilization provokes is, as Brenner notes¹²⁷ particularly in the behaviour of 'Japan Inc.', a form of 'overproduction' – output is higher than would have been suggested by the 'normal' interaction of supply and demand. In the previous chart, capacity utilization would have only been 50%, not the 'contrived' 60%. If one then accepts the argument that there is an eventual aggregate output level at which the CSQS no longer produces a margin sufficient to cover all costs, this 'overproduction' brings forward the day of commoditization by 'prematurely' satisfying some of the value-adding demand that remains in the product's PLC.

This suggests the following in PLC terms:



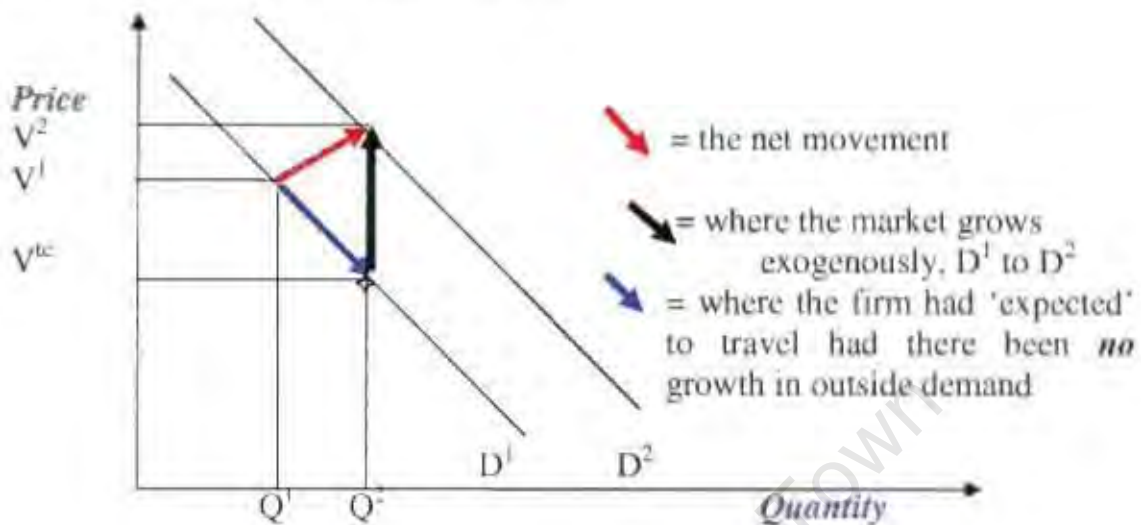
From point G through to R, if the sale of an additional unit would make additional true profit, and a company has surplus capacity available to meet that sale, rarely would a company pass up on that opportunity, even if it means sacrificing 'just a little bit of margin' to do so. This satisfaction of a unit of appetite takes the elasticity of demand one step closer towards 'saturation', point R. When a number of firms give up 'just a little bit of margin' (a practice epitomised in the US by the 'coupon wars') to achieve each incremental sale, commoditization becomes a form of 'death by a thousand cuts'.

iv. A first glimpse at how the PLC is traced out.

In the early Rounds of a PLC, firms might *appear* to be facing a *forward* sloping demand curve if the market is looked at dynamically. The normal scenario is that, given a market at a point in time, a supplier might increase output expecting and so 'not minding' the price of the product to fall as a consequence. This happens *but* for the fact that the innate 'organic' demand for

¹²⁷ Brenner R., 1998

the product continues to grow regardless thereby 'outrunning' the increase in supply. This scenario is traced out below;



Explanation of the above diagram

What is being identified **here in red** is not so much a forward sloping demand curve but *very approximately* **a segment of the PLC**. Assume there is only one supplier in this example. At the beginning of time T, that firm expected to move from V^1 to V^{tc} by the end of time period T. It increased planned output from Q^1 to Q^2 . But during T, demand grew 'exogenously' from D^1 to D^2 . New quantity was supplied as had been intended (Q^2 less Q^1) but this was bid up by new demand so that the price of the marginal sale at Q^2 rose to V^2 rather than fell to V^{tc} as would otherwise have been anticipated. V^{tc}/Q^2 would have materialised if the shape of demand stayed the same and the price had fallen.

vii. Using Vector analysis to determine the shape of the PLC¹²⁸.

This evolution of the PLC is now examined by using vector analysis.

¹²⁸ Vector theory sourced from <http://www.ping.be/~ping1339/>

The following **initial** assumptions are made:

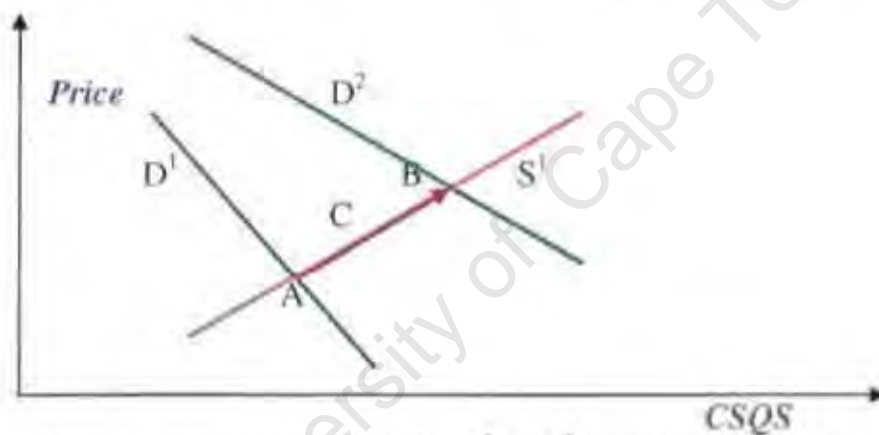
1. The shape of the PLC is traced out by the intersection of supply and demand over the product's life. The y-axis is portrayed as a measure of corporate pricing power (specifically value-addedness) being the net of total revenues less total costs, the latter including an appropriate capital charge.

*Initially, however, we look at the price movement as a reflection of 'raw' pricing power and refine the distinction to true value-addedness later by taking into account costs. Until that point, constant costs are assumed. The x-axis remains *CSQS/Cost of Capital*. Note that once a unit is sold, it cannot be 'unsold'. Consequently the value of total supply at the start of one time period is at least the same as it was at the beginning of the previous time period. Furthermore the vectors derived below cannot be derived unless at least one new sale occurs after the start of time t thereby confirming a new price and so a new end-of-time-period- t equilibrium.*

2. We focus on the net changes in supply and demand taking place **within** discreet time period, t . **The definition of t is that suppliers and consumers do not have time to react to events occurring within t and have those reactions reflected within t . Any consumer reactions to events initiated by the suppliers during t are reflected in demand curves (and their elasticities) of $t+1$ and beyond. Similarly any supplier reactions to events initiated by consumers (or other suppliers) during t are reflected in supply curves (and their elasticities) of $t+1$ and beyond.**

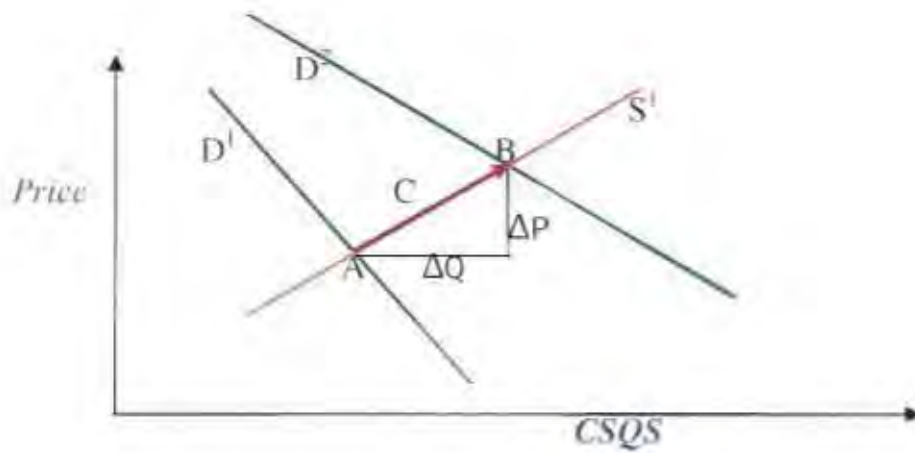
3. Two separate events are identified: an outside increase in demand *and* an industry increase in supply. ‘Outside’ here means ‘organic’ but can include response to actions taken in the market before time t began. Each of these two events is first judged on its own by reference to the prevailing elasticities of supply and demand respectively, thereby creating two separate vectors. We then combine these two separate events to determine the net movement – a third vector – to establish the new equilibrium at the end of the time period t . This latter point forms the starting position for the same process at time $t + 1$.

Phase 1: First consider an ‘outside’ growth in demand.



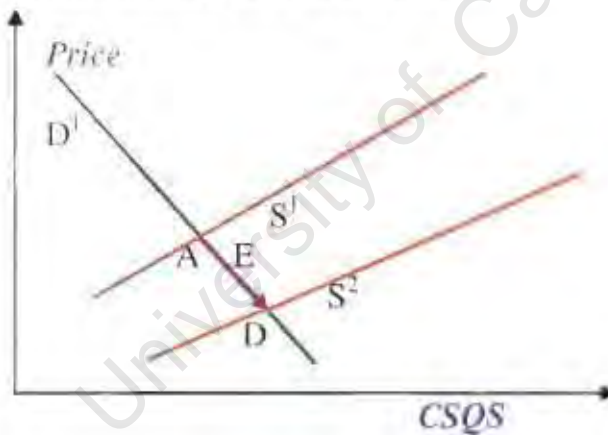
- ❖ Assume demand increases from D^1 to D^2 over the course of time period t .
- ❖ The supply curve S^1 connects D^1 to D^2 from points A to B creating vector C .

Triangle X: A right-angled triangle, triangle X , with vector C as the hypotenuse, can be drawn. The two sides that are adjacent to the right angle are shown as horizontal (measuring the increase in quantities sold) and vertical (measuring any change in price).



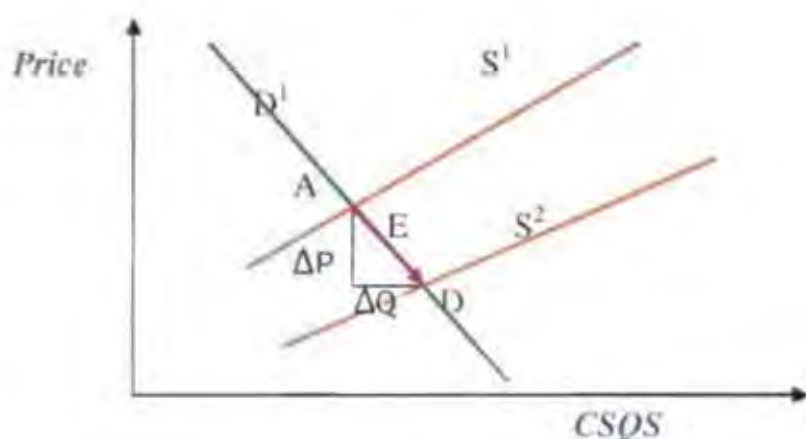
The ratio of $\frac{\% \Delta P}{\% \Delta Q}$ = the elasticity of supply in this specific circumstance, the growth of outside demand.

Now consider an industry growth in supply.



- ❖ Assume supply increases from S^1 to S^2 over the course of time period t .
- ❖ The supply curve D^1 connects S^1 to S^2 from points A to D creating vector E.

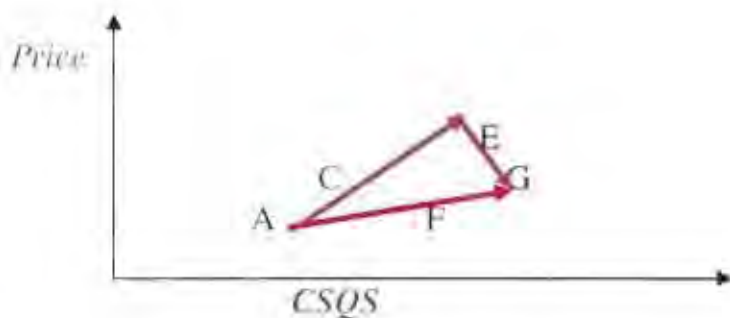
Triangle Y: A similar right-angled triangle, triangle Y, with vector \vec{E} as the hypotenuse, can be drawn to represent this change.



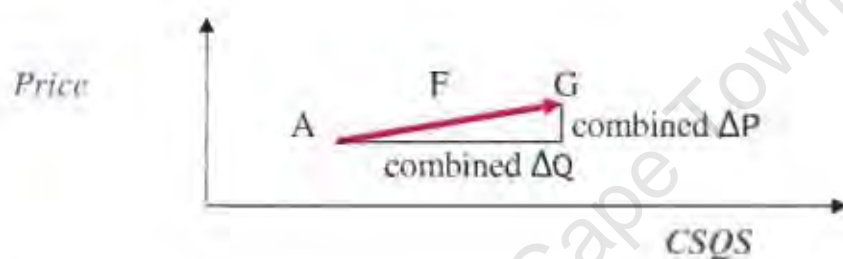
The ratio of $\frac{\% \Delta P}{\% \Delta Q}$ = the elasticity of demand, which is usually negative because in normal circumstances price would fall if supply increased.

Phase 2: Combining two vectors to derive a PLC segment

Both vectors C and E can now be combined, and vector F derived. This shows the combined net movement of prices and quantities sold over the time period t resulting from any 'outside' changes in supply and demand. A new equilibrium point G is derived representing the price/aggregate extra quantity sold combination at the end of time period t .



Triangle Z: Vector F can itself be shown in terms of a right angle triangle, triangle Z.



Point G is calculated as follows:

Assume at point A, the price obtained for the last unit sold was σ . Furthermore the total quantity of the product sold at A was Ω .

The *price at G*, σ^g , would be σ + change in price in triangle X (height of triangle X) ΔP^x , plus the usually *negative* change in price in triangle Y (the height of triangle Y) ΔP^y .

The *cumulative quantity sold at G*, Ω^g , would be Ω + change in quantity in triangle X (width of triangle X) ΔQ^x , plus change in quantity in triangle Y (the width of triangle Y) ΔQ^y .

Both heights and widths are percentage changes of the starting values, σ and Ω . G can be described more succinctly then as:

$$\sigma^p = \sigma + \frac{\sigma (\Delta P^{x-y})}{100}$$

$$\Omega^q = \Omega + \frac{\Omega (\Delta Q^{x+y})}{100}$$

From the above, the following measures can be extracted; $\% \Delta \sigma$ and $\% \Delta \Omega$. Using the normal logic of elasticity (and assuming constant costs), it is possible to derive the following concept:

$$\frac{\% \Delta \sigma}{\% \Delta \Omega} = \phi.$$

ϕ measures the 'elasticity' of the PLC.

If ϕ is positive, the suppliers still have pricing power moving in their favour and the product is still in the upward sloping, first part of its PLC curve – between B and M. If ϕ is negative, the suppliers are starting to lose pricing power and the product is now in the downward sloping, second part of its PLC curve – between M and Z.

Zero 'elasticity' of the PLC occurs at maxima, M.

The assumption underlying this analysis presupposes $\% \Delta \Omega$ will always be positive – each time period, t , requires at least one unit sale.

Given that $\% \Delta \Omega$ is positive:

Where ϕ is positive overall, then $\% \Delta \sigma$ must also be positive.

Where ϕ is zero overall, then $\% \Delta \sigma$ must also be zero.

Where ϕ is negative overall, then $\% \Delta \sigma$ must also be negative.

$\% \Delta \sigma$ is a measure of ‘raw’ pricing power. Once adjusted for the cost environment, it measures overall pricing power.

viii. Adjusting $\% \Delta \sigma$ to accommodate the exact definition of what is being measured on the y-axis: value-addedness, not price.

At the outset of the previous sub-section, it was noted that: ‘*we look at the price movement as a reflection of ‘raw’ pricing power and refine the distinction to true value-addedness later by taking into account costs*’.

In the vectors used above, the Y-axis measures price. One must now reconcile price to what is actually being measured on the Y-axis, **value-addedness**.

Value-addedness at every point is a function of price, *as value-addedness is by definition embedded in price*. The difference at any point on the **CSQS** sequence is accounted for by a marginal measure of unit costs. The above vectors must be adjusted for any change in average costs that occur during

period t . Critical to understanding the direction and magnitude of this adjustment is the shape of the average cost curve over time period t .¹²⁹

Mathematically the adjustment would be:

1. Firstly, one calculates costs at time t being average cost per unit at the start of time t , AC^T , where accumulated quantity sold would be Q^T :

$$AC^T \times Q^T$$

2. This would then be multiplied by the number of units sold during time t namely Q^N :

$$(Q^N)(AC^T \times Q^T)$$

3. From this figure – which would have assumed average costs remained flat during time period t – the aggregate fall in unit costs for all units sold during time t would need to be deducted. This is represented by:

$$AC(Q^T+1), AC(Q^T+2), AC(Q^T+3)... AC(Q^T+N).$$

Together, this yields:

$$(Q^N)(AC^T \times Q^T) - \sum AC(Q^T+1) \text{ to } AC(Q^T+N)$$

$$\text{or } (Q^N)(AC^T \times Q^T) - \frac{AC(Q^T+1) + AC(Q^T+2) + \dots + AC(Q^T+N)}{N}$$

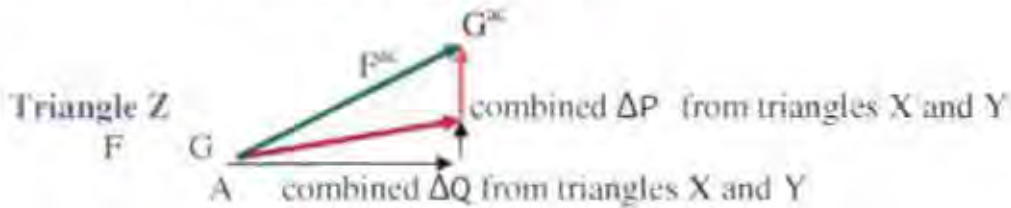
¹²⁹ In the real world, when unit costs are being calculated, time t often becomes the relative accounting period, a quarter, a six-month period and/or a year. This might not satisfy the strict definition of t used herein.

In this respect, the following assumption can be made: if there is any value-added margin still to be made by the industry in the product, the average cost curve (including a per unit capital charge) must still be downward sloping. This coincides with the mathematical truth that the average cost curve reaches its minima where it equals the marginal cost curve. (We also know from economic theory that if the industry is producing where $AC=MC=MR$, it is in the idealised world of 'perfect competition'. Elsewhere herein, it is shown that this confluence *cannot occur at any point on the PLC curve*. That said, as Point **R** looms, there *may* be growing evidence of certain traits akin to perfect competition observable in a market.)

By deduction, the long run average cost curve cannot reach its minimum before Point **R** in terms of the PLC. Therefore any intermediate equilibrium between **B** and **R** which represents a profit maximising point in a particular set of industrial circumstances must also be being achieved whilst the average cost curve is downward sloping. Bluntly put, further value-added on the marginal unit sold can only be generated when **both** the demand and average cost curves are downward sloping. (Whilst necessary, this condition is not always sufficient; during the first phase of the PLC curve when both the average cost curve and the demand curve would be downward sloping, from Point **B** to Point **G**, value is still being destroyed.)

This means that any adjustment made to the vectors derived which is driven by the need to reconcile price to value-addedness **would be a positive one, i.e. with the net effect of widening the value-added margin**. Thus, in terms of the height of triangle Z, it would be even higher for as long as the PLC curve had not passed through Point **R**. (Thereafter if decreasing returns to scale set in, the cost adjustment would be **negative**.)

Assume the PLC has not yet reached Point **R**.



Observations

1. Vector F^{ac} represents F , the 'price only' vector, *adjusted to reflect the continuing fall in average costs during time t* .
2. Point G^{ac} represents the adjustment to Point G to give the additional value-added margin gained by reflecting the influence of the continuing downward sloping nature of the average cost curve. **This additional adjustment to the starting value of the value-added margin at the beginning of period t to the end of period t (G^{ac} less G) is given the notation σ^{ac} . One way of thinking about this is to say pricing power is a composite measure – G being the 'external' component derived from the nature of the evolving market, G^{ac} being the 'internal' component derived from the nature of the evolving industry cost environment.**
3. Furthermore, for a refinement that follows below, the following notation is given:

σ^{ac} = the change to the value-added margin arising over time t due to any change in *average costs*

σ^p = the change to the value-added margin arising over time t due to any change in *prices*

σ^t = the *total* change to the value-added margin arising over time t due to both changes in average costs and prices i.e. $\sigma^{ac} + \sigma^p$

4. It is important to note that when value-addedness is value accretive at the margin (or even simply improving, so this includes the Point **B** to Point **G** section of the PLC i.e. anywhere between **O** and Point **R** on the x-axis), σ^{ac} has a positive additional effect on the value of σ^p ; i.e. $\sigma^t > \sigma^p$ implying *increasing returns to scale are an ever present feature of a non-commoditized PLC*. This means for as long as a supplier can increase output while still operating on the downward sloping part of the average cost curve, i.e. σ^{ac} is positive, *at least part* of any new sale conceded at a lower price can be recouped by the lower cost at which that marginal unit was available.
5. The adjustment, σ^{ac} , has important implications for understanding the exact nature of the PLC's 'elasticity', ϕ . To use a motion-based analogy, the supplier normally has the added advantage of the gravitational momentum allowed by a downhill cost slope underpinning any sales up to the point where commoditization occurs. Thus at any value-addedness/CSQS combination before **R**, the nature of the costs prevailing in the industry always adds to the responsiveness or elasticity of the change in value-addedness, the corporate pricing power, resulting from an increase in the aggregate sales of a particular product. **But there is an important qualification here:** when new competitors enter a market and steal market share from an incumbent, it is possible for that incumbent to 'go backwards' up his average cost curve. This occurs if a lower part of the average cost curve previously addressed now becomes inaccessible

and average costs rise because the incumbent's capacity utilisation falls. *This suggests, in micro detail, one of the ways in which competition drags down Force A, pricing power, and underlines the importance of 'maintaining market share' and 'aiming for high capacity utilization'.*

6. Whether the overall effect on σ^t is positive, neutral or negative depends on the magnitude of the change in σ^p relative to that of σ^{ac} . Maxima **M** is the point at which pricing power aided by the still positive nature of σ^{ac} (which continues to be positive until at least the PLC curve reaches Point **R**) is equalled for the first time by purchasing power which is now embodied in the negative value of σ^p .

This means that σ^p actually turned negative *before* the PLC reached **M** but the curve continued to show a net rise because of the positive value still being felt from σ^{ac} . This also means that consumer purchasing power assumes the upper hand in the battle with what is called 'raw' pricing power *even before M*. But this fact was offset by the continuing ability of suppliers to exploit the downward sloping nature of their cost curves. In other words, after σ^p peaks but before the PLC does the same, suppliers may be losing on the price front but they are still winning overall because falling costs are still sufficiently in their favour to outweigh this price effect.

7. Such is the nature of shortening PLCs in today's world that there are only a few products (cigarettes, Coca Cola) that – in their *original* format or model – are powerful enough to be able to make nominal prices stick, let alone achieve rises. Pricing power is increasingly derived from 'internal' rather than 'external' sources – more from accessing a falling marginal costs than from higher prices.

This can add to market indiscipline among suppliers in a growing market though their behaviour is perfectly understandable; if a company cannot raise prices, the only way it can increase annual profits is by raising its level of unit sales and, in the process, hopefully deriving additional benefits from accessing its falling average cost curve. Hence the temptation is to cut prices.

Thus where the market is still growing at least in part 'organically', there is 'everything to play for'. Making that marginal extra sale not only increases the chance of raising or even simply maintaining market share, it gives the supplier the best possible chance of growing year-on-year profits. And where the market is static, or perhaps even declining, not making that extra sale means there is 'something to lose'.

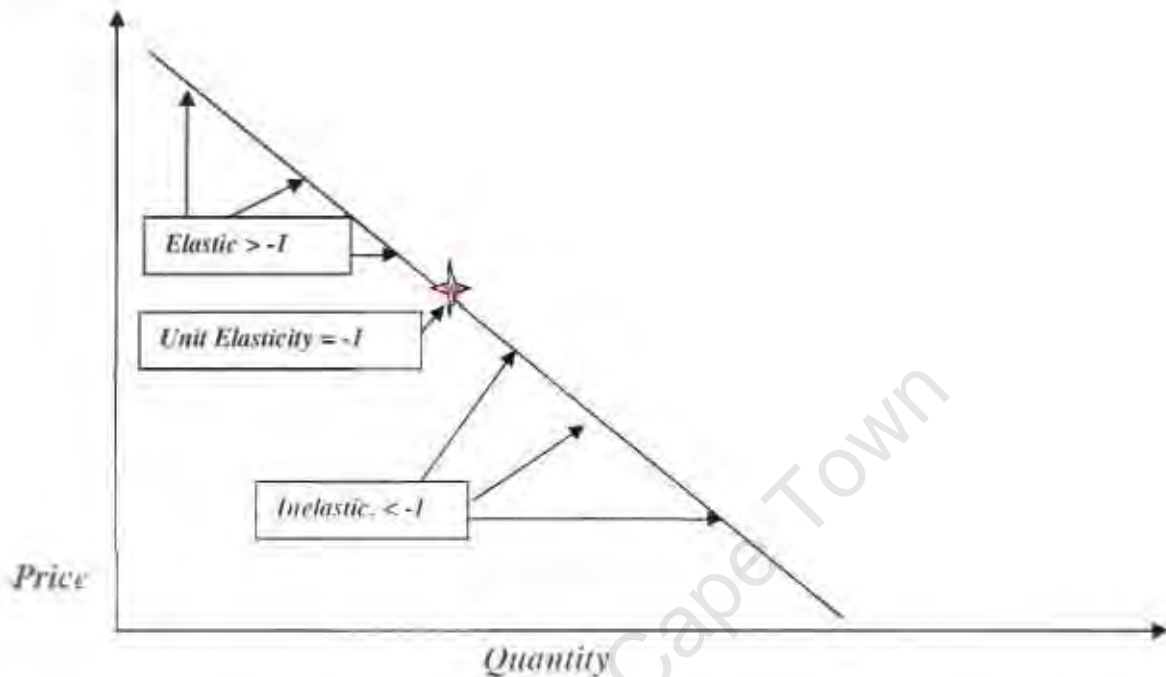
ix. Elasticity of demand and the 'Elasticity' of the PLC related.

The essential observation about elasticity of demand in the PLC's early phases is that it cannot overwhelm the PLC's own 'inelasticity'.

Classic theory of the firm suggests that a profit maximising firm will aim to address an elastic part of the demand curve. During a product's launch and take-off, the typical firm (be it a profit or revenue maximiser) may indeed be addressing an elastic part of the demand curve but because the market is developing so fast, it will be addressing the 'inelastic' section of the PLC.

Such a situation would, for suppliers, constitute the '*best time of their corporate lives*' – increasing supply (perhaps even prices) in a market with (for now) an insatiable and seemingly price-insensitive appetite for their product.

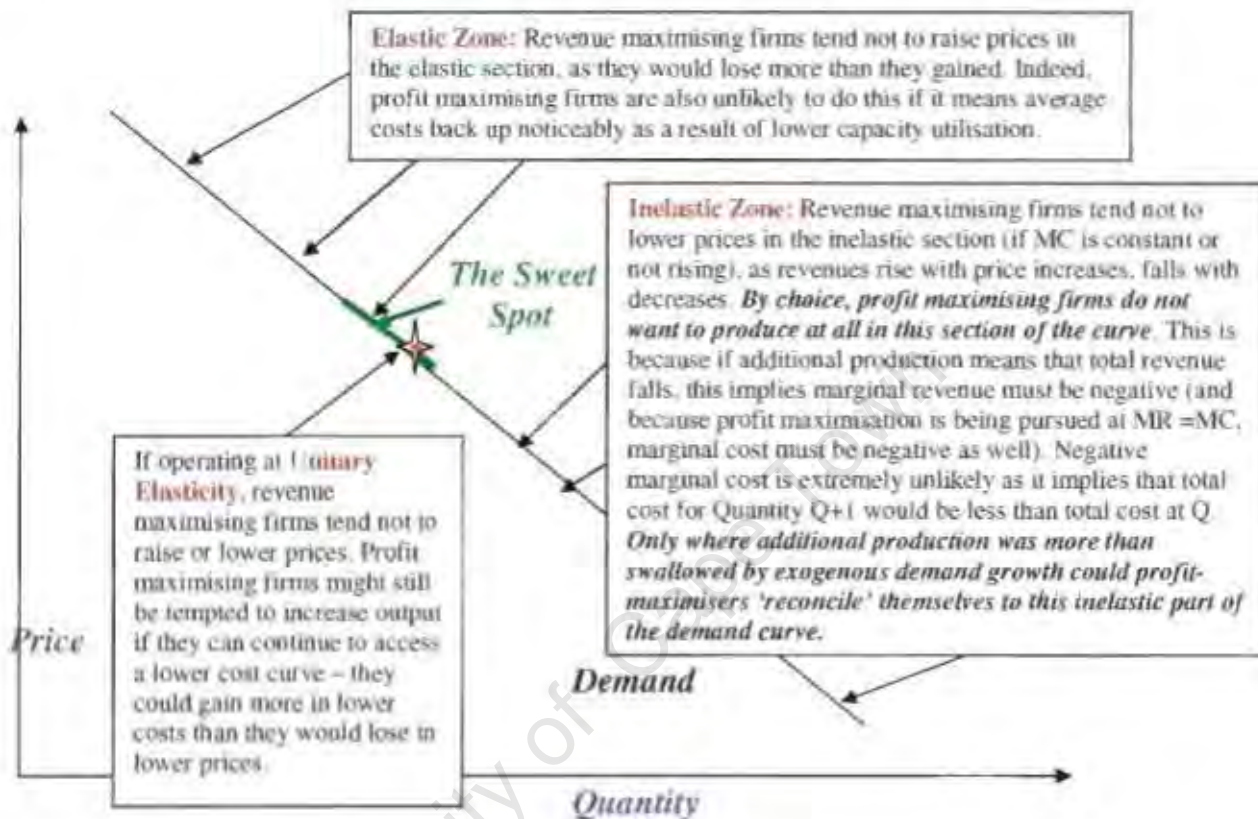
This scenario is detailed below. The classic demand curve would be shown as follows:



In a dynamic world, this demand 'curve' would be subject to some basic generalisations so far as profit or revenue maximising firms are concerned, even though there is frequently a blurred distinction between these two objectives, especially in a rapidly evolving, early-phase market.

In practice, during the early Rounds of a PLC, turnover matters more than profit – besides, without turnover there can be no profit! (This is evidenced by the recent bias amongst tech start-ups to lead their financial results with revenue growth; not unsurprisingly, perhaps, as few had profits to report!) Later in the PLC, margins and profits seem to matter more, again as evidenced by changing priorities in market reporting. However, if there are still some revenue chasers (the Japanese/Korean disease) operating in the market in Rounds 5 and 6 of the PLC, this may 'spoil it for everyone'.

This chart summarises the classic 'theory of the firm' generalisations.



The *practical* conclusion of the above is that, in a fast growing market, most firms would prefer to operate in the just-on-either-side-of-unitary-elasticity 'sweet spot' of the demand area identified in dark green, with a secondary target being to move as close to the point of unitary elasticity as possible. (This 'sweet spot' neighbourhood – which in the real world would be virtually impossible to delineate precisely – is identified in a second way below.)

The above diagram raises the tactical possibility of a monopolist operating – against conventional wisdom – where the demand curve is *just inelastic*, expanding supply as the market expands, enjoying the longer term advantages that accrue as a result of 'oversupplying' and 'underpricing' its output. In this

approach, the monopolist would be foregoing *immediate* profit maximization. This would describe Microsoft's deliberate *underpricing*¹³⁰ strategy today (see case study in **Section 5** for details): their 'profit foregone' rationale is justified in the longer term by being compensated for by extra growth in the network effects arising from the extra sales 'allowed' of their software. (It is called 'addiction'!) But this counterintuitive 'sweet spot' is unlikely to be 'forever' and at some point in the PLC a monopolist (even one such as Microsoft) would move back to the 'normal', more elastic, part of the demand curve.

The implication for long-run supply arising from the above demand curve is summarised in the 'logic box' below.

	Profit Maximiser	Revenue Chaser	Net Result
In the elastic zone	Increase Output, but not increase prices	Increase Output	Both Increase Output
At unitary elasticity	The efficient will increase output to access lower unit costs, notwithstanding lower prices	Sit Still	Efficient profit maximisers rock the boat by increasing output
In the inelastic zone	Would prefer not to operate in this segment at all; if trapped here would be inclined to raise prices and/or reduce output	Sit still or raise prices; revenue maximising firms tend not to lower prices in the inelastic section, revenues rise with price increases, fall with decreases	Profit maximizers try to escape this zone to one of the other two – when successful, either or both will again resort to increasing output!!



What the above table shows is that, whatever portion of the demand curve is being addressed, rarely would both types of firm be happy either to operate *indefinitely* in that zone or to 'sit still'. Sooner or later, one or other or even

¹³⁰ Krugman P., 26.4.2000, *New York Times*

both firm types would be inclined to 'rock the boat' in the logical name of achieving their chosen objective; *this disruption would always lead to increased output, even though this may not be realised immediately.*

Occasionally profit-maximizing suppliers in the inelastic zone might 'put on the output brakes', but this will soon lead to the market moving back to a more elastic section of the demand curve, at which point the brakes come off again and supply would increase. But the degree of market control implied by a 'stop-go' approach suggests strong market discipline is required. The diamond cartel made this possible for De Beers: reducing box sizes at the 10-times-a-year 'sights' dried up flooded gem markets. But can one really imagine the butcher not selling that extra joint, the brewer that extra barrel of ale or the baker that extra loaf? Such market discipline is almost impossible to enforce in multi-firm industries and, if it can be, the charge of collusion would likely stick.

This stop-go cycle (characteristic of De Beers' behaviour for the past century) is not often feasible in markets where the tyranny of expectations arising from stockmarket investors directs firm behaviour. Rare is it that a company reports that while profits were higher, volumes were lower (rare, but not impossible; oil companies do this without highlighting volume throughput falls). Markets are generally suspicious of such 'achievements'. As De Beers found out, *the investor gallery applauds the sale achieved much more than the sale foregone.*

It follows that, given time, Rounds 3 to 6 of the PLC are inherently unstable where both types of firm are operating in the same market.

Even in an industry only composed of revenue maximisers, equilibrium is only maintainable if it can sit on the knife-edge of unitary elasticity. In practice, and assuming such market discipline could be enforced, this is also unsustainable because time itself does not sit still and the nature of demand on its own would continue to evolve as each extra unit of product gets sold, most likely pushing the revenue maximisers down the other side of the PLC. Furthermore the same principles would apply as to how a cartel is usually undermined if (when!) one member '*cheats on the side*' – eventually the equilibrium for all will be disrupted. Once off the top of the PLC, there would be a scramble to preserve market share amongst the revenue maximisers and the equilibrium of Point M is (by the CSQS definition assumed herein) almost certainly unrecoverable.

Where the industry is made up only of profit maximisers, they would *not* want to remain in the inelastic zone as this would imply that there exists as yet uncaptured profit. The 'pure' profit maximiser, having got back to the elastic zone, would then try to move back towards unitary elasticity by raising output again. (This is more in line with De Beers's past strategy.) It would only be a matter of time before an industry made up wholly of profit maximisers would regain the elastic zone of the demand curve and succumb to raising output.

Add to the above the practical fact that at different Rounds of a lifecycle, some companies would have proceeded upon the assumption the way to achieve profit maximization would be via revenue maximization and both strategies would have existed *within the same company*. This 'corporate schizophrenia' can compound the innate instability of any equilibrium on the PLC. And accepting that a supplier would never having perfect knowledge, one can understand how a corporation might opt for a strategy that was not 'point-specific' but rather aimed at following a broader 'profit-maximizing path' by

aiming output at the ‘sweet spot’ neighbourhood, and where the option exists, erring on the side of producing more not less.

In an information economy, where the marginal cost of replication of an information-rich good is near negligible and the very definition of ‘capacity’ loses meaning, this bias towards higher output will be all the more likely.

Finally, in its early Rounds during which the PLC is itself ‘inelastic’, both sides can go for output growth with short-term impunity – neither side loses by holding back. Indeed the opposite is often true – anyone who does hold back can expect to lose, in both the short and the long term. Only those with great foresight can see what this scramble will inevitably lead to – overcapacity and a level of supply that will eventually weigh down on everyone’s value-added margins. But as ‘*getting down the cost curve first*’ often brings with it first mover advantage, there is little incentive for even the far-sighted to hold back.

Zugzwang: damned if you move, even more damned if you don’t

In the game of chess, situations arise where one player is faced by a position whereby whatever move he makes – and usually the option is limited to only one – that player’s predicament worsens. This is known as ‘*zugzwang*’ – German for ‘*move compulsion*’.

Later in the PLC, a supplier can face a similar position. The option of doing nothing exists (unlike chess where the player *must* move), but in the normal dynamics of a market, ‘doing nothing’ is usually even more ill advised than ‘doing something’. Yet ‘doing something’ makes the situation worse – especially when there are a large number of competitors behaving similarly.

The classic problem – call it Sraffa’s dilemma¹³¹ – for a supplier with surplus capacity is what to do in a competitive market: hold out and not cut prices but risk losing market share *or* go for sales by cutting prices. If the company were privately owned (as De Beers effectively was, notwithstanding its stockmarket quotation), the ‘hold out’ option might be the lesser of two evils. But where a company is publicly owned and subject to the glare of market analysts, this option is less viable because of the tyranny of market expectations.

Most companies are particularly anxious to maintain a growth premium in their stock price rating. Falling volumes *or even falling rates of volume growth* (indeed any development that reflects negatively on the PEG – price-earnings-growth – ratio) are warning signs that the high growth era may be ending and that the growth premium in the share price may no longer be justified. Faced with this dilemma, most suppliers would opt for higher volumes at lower prices hoping that a still falling cost curve could offset any margin compression.

As a fund manager questioning company officers about volume growth and margin pressures, I have always detected an uneasy mix of fear and greed at this juncture. The fear comes from not wanting to ‘*lose the next sale to someone else*’; the greed comes from the desire to ‘*capture the next sale for ourselves*’. This combination of motives patently exists in a high growth environment where ‘*there is much to play for*’. More remarkably, I found these motives even stronger in weak growth environments. In the case of quoted companies, the tyranny of market expectations and the need to do better than

¹³¹ ‘The chief obstacle against which they (businessmen) have to contend when they want gradually to increase their production does not lie in the cost of production but in the difficulty in selling the larger quantity of goods without reducing the price...’ Sraffa P., 1926

last time (i.e. last reporting period) reinforces these impulses. The net result? Equilibria based on standing still and 'not rocking the boat' rarely last.

Again this suggests the following in PLC terms.



From points G to R, if the sale of an additional unit would make additional true profit, and a company has surplus capacity available to meet that demand, rarely would a company pass up on the opportunity to make that extra sale.

x. Elasticities, prices and profit maximisation: A unique solution.

This section addresses the proof that brings together corporate pricing power and consumer purchasing power – as represented by the interaction of the elasticities of demand and supply – in a single equation defining profit maximisation and reinterprets Marshall's 'scissors' quote in this context.

- Let E_S = Price Elasticity of Supply
- E_D = Price Elasticity of Demand
- Q = Quantity
- MC = Marginal Cost

MR = Marginal Revenue

C = Total Costs

P = Price

Assumptions of key inputs: E_S , E_D , MC and MR

Price Elasticity of Supply – E_S ¹³²

$$E_S = \frac{\% \Delta Q}{\% \Delta MC}$$

$$= \frac{\Delta Q}{Q} \times 100$$

$$\frac{\Delta C}{C} \times 100$$

$$= \frac{\Delta Q}{\Delta MC} \times \frac{MC}{Q}$$

$\frac{\Delta Q}{\Delta C}$ measures the slope of the supply curve, which is also the marginal cost curve for the firm.

$\frac{C}{Q}$ measures the ratio of cost to quantity at the point being measured on the supply/marginal cost curve.

It is the slope of the supply curve multiplied by the cost/quantity ratio that yields the elasticity. The sign of price elasticity of supply is nearly always positive.

Price Elasticity of Demand – E_D

$$E_D = \frac{\% \Delta Q}{\% \Delta P}$$

¹³² The usual notation in economics is to use 'price' as the unit measured on the y-axis when examining both supply and demand. This shorthand requires further explanation.

- ◊ When referring to demand, price when coupled with quantity, translates into 'revenue'. Marginal revenue represents the change in revenues resulting from an extra price/quantity combination.
- ◊ By the same token, when referring to supply, price when coupled with quantity, translates into 'cost'. Marginal cost represents the change in costs resulting from an extra price/quantity combination.
- ◊ That is why in these definitions, cost is used in defining the elasticity of supply and revenue when defining the elasticity of demand. The distinction, as will become apparent, is critical.

$$= \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100}$$

$$= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$\frac{\Delta Q}{\Delta P}$ measures the slope of the demand curve.

$\frac{P}{Q}$ measures the price and quantity values for the point being measured on the demand cost curve.

The slope of the demand curve multiplied by the revenue/quantity ratio yields the price elasticity of demand. Normally, the sign of this measure is negative.

Marginal Cost – MC

$$MC = \frac{\Delta \text{ total costs at output } Q}{\Delta \text{ in output } Q}$$

$$= \frac{TC(Q + \Delta Q) - TC(Q)}{\Delta Q}$$

Marginal Revenue – MR

$$MR = \frac{\Delta \text{ revenue at output } Q}{\Delta \text{ in output } Q}$$

$$= \frac{R(Q + \Delta Q) - R(Q)}{\Delta Q}$$

Binding these four inputs together

The relationship between Marginal Revenue and the Elasticity of Demand

$$\text{Given that } E_D = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} \text{ or } \frac{P \Delta Q}{Q \Delta P}$$

$$\text{and given that } \Delta R = P \Delta Q + Q \Delta P$$

Dividing through by ΔQ , we get the expression for marginal revenue:

$$MR = \frac{\Delta R}{\Delta Q} = \frac{P\Delta Q + Q\Delta P}{\Delta Q} = P + Q \frac{\Delta P}{\Delta Q}$$

This can be rewritten as $\frac{\Delta R}{\Delta Q} = P \left(1 + \frac{Q\Delta P}{P\Delta Q}\right)$

and noting that $\frac{Q\Delta P}{P\Delta Q} = \frac{1}{E_D}$

it follows that $MR = P \left(1 + \frac{1}{E_D}\right)$

The relationship between Marginal Cost and the Elasticity of Supply

The firm's supply curve is also its marginal cost curve.

Given that $E_S = \frac{\Delta Q \times MC}{\Delta MC \times Q}$

Rearranging for MC yields $MC = \frac{Q \times E_S \times \Delta MC}{\Delta Q}$

Just as there is a relationship between Marginal Revenue and Elasticity of Demand, so there is a relationship between Marginal Cost and Elasticity of Supply.

Proof linking the elasticities with profit maximisation.

Assume $MR = MC$ where profit is maximized. It therefore follows that:

$$\frac{Q \times E_S \times \Delta MC}{\Delta Q} = P \left(1 + \frac{1}{E_D}\right)$$

The object of the exercise is to derive an equation that reflects the above equation in the context of P , price.

Dividing through by P yields:

$$\frac{Q \times E_S \times \Delta MC}{\Delta Q \times P} = \frac{(1 + \frac{1}{E_D})}{E_D}$$

Inverting the whole equation yields:

$$\frac{\Delta Q \times P}{Q \times E_S \times \Delta MC} = 1 + E_D$$

Rearranging for $\Delta Q, P$ yields:

$$\Delta Q, P = (1 + E_D)(Q \times E_S \times \Delta MC)$$

Multiplying out the second half of the equation yields:

$$\Delta Q, P = Q \times E_S \times \Delta MC + E_D \times Q \times E_S \times \Delta MC$$

This can be rearranged to yield:

$$\Delta Q, P = Q, \Delta MC (E_S (1 + E_D))$$

Rearranging for $(E_S (1 + E_D))$ having substituted α for $(E_S (1 + E_D))$ yields:

$$\alpha = \frac{\Delta Q \times P}{\Delta MC \times Q}$$

Rearranging for P yields:

$$P = \frac{\alpha (\Delta MC \times Q)}{\Delta Q}$$

Assume the limit of $\Delta Q = +1$. This would be in accordance with a businessman contemplating the sale of an extra unit while wishing to maximize profit – which in practice means to maximize the profit margin – from that sale.

Then:

$$P = Q, \Delta MC, \alpha$$

Resubstituting the full value of α yields:

$$P = Q, \Delta MC, E_S (1 + E_D)$$

xi. What this equation – $P = Q, \Delta MC, E_S (1 + E_D)$ – is telling us

This formula tells us which variables influence price assuming a profit-maximizing *path* is being sought.

The equation suggests price is a function of:

- the quantity so far sold, Q ;
- the character of the cost structure prevailing at sales level Q , ΔMC ; and
- the interaction of the two blades of Marshall's pair of Scissors, demand and supply as represented by their respective elasticities.
- time, as 'neutrally' embedded in the Q measure of *CSQS*.

Each of the equation's constituent parts deserves closer examination.

1. α or $(E_S (1 + E_D))$

First note the limits of the elasticities of supply and demand over the length of the PLC.

Price Elasticity of Demand moves from zero through negative unitary towards negative infinity, the negative value reflecting the demand curve's 'downward sloping' character.

Price Elasticity of Supply moves from zero through positive unitary to positive infinity, the positive value reflecting the supply curve's 'upward sloping' character. (Occasionally this evolution may regress as cyclical periods of inelastic supply occur in the latter stages of the PLC.)

Price Elasticity of Supply is always greater than the value of **Price Elasticity of Demand** (*except* when both equal zero), even ignoring the 'negativeness' of the latter measure. This recognizes the scarcity coefficient implicit in any price.

(This comment may *appear to be* qualified in the case of the kinked supply curve – which leads to sharply falling prices over a range; even so, prices will ‘never’ fall below zero implying that, in extremis, E_S is always greater than the absolute value of E_{pd} .)

Note also that:

The overall value of α would stay positive until E_D reached a value of negative 1.

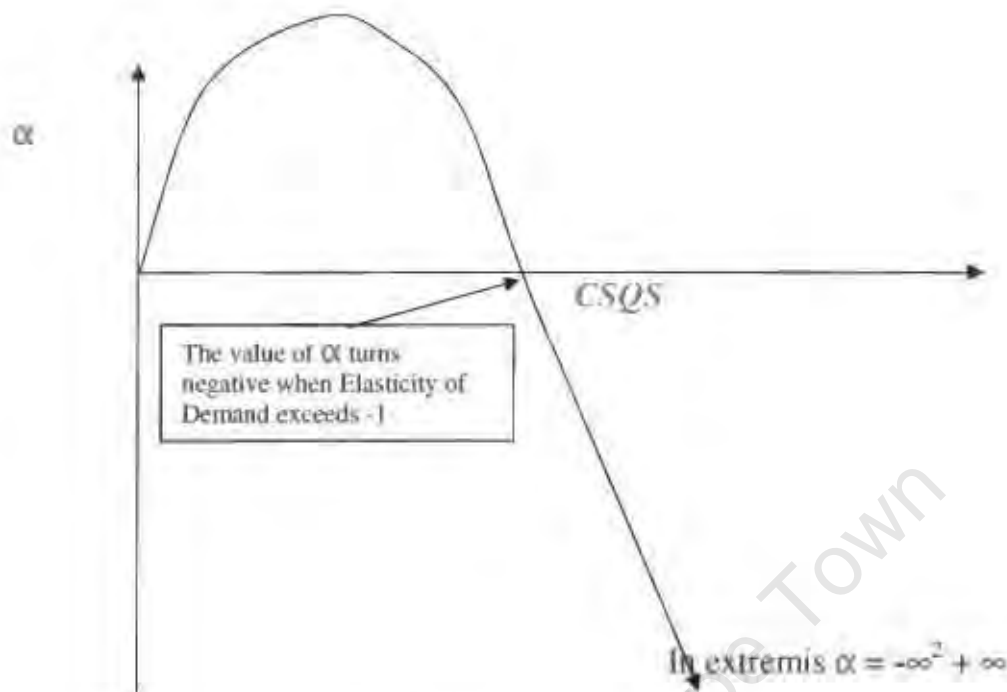
When E_S is zero, so is α and thereby the whole equation for P .

If $E_D =$ zero, $\alpha = E_S$ and $P = Q \cdot \Delta MC \cdot E_S$ (This is most likely only a theoretical limit as it is extremely unlikely that E_S could be higher than zero when E_D would remain at zero.)

When either Q or ΔMC is zero, so is P .

When both elasticities reach infinity, $\alpha = \infty (1 - \infty)$ or $-\infty^2 + \infty$.

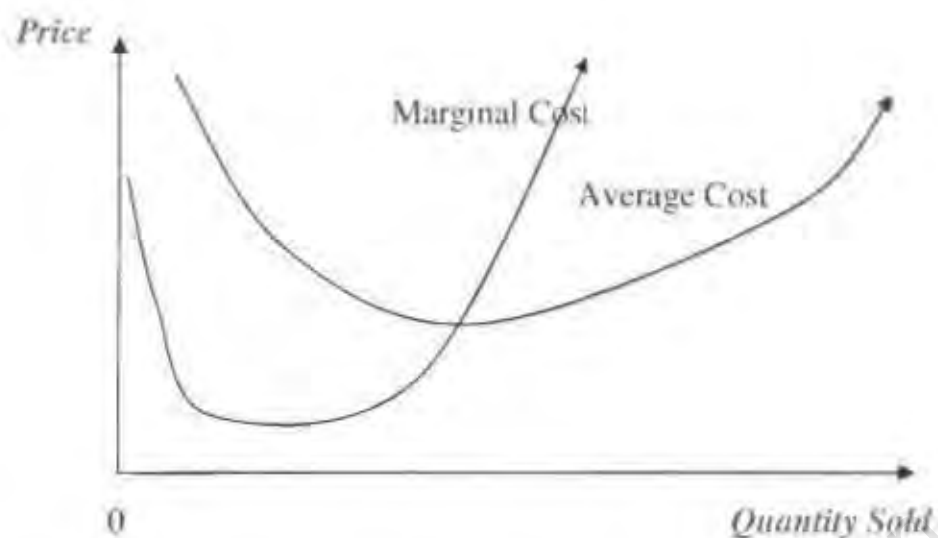
$Q \alpha$ alone would plot the following curve – a product lifecycle representing net ‘raw’ pricing power *before the change in marginal costs are considered* – given CSQS *alone* on the x axis (and disregarding a possible kink in the supply curve for this base case).



2. This leads to addressing ΔMC : the change in marginal cost.

The other main variable in the equation – ΔMC – is a directional steer, both amplifying and, once E_D is greater than minus 1, potentially dampening α , bringing it back closer to the x-axis. This is because ΔMC is always positive, and capable of honing pricing power's edge any time before the low point in the average cost curve is reached.

The typical marginal cost curve looks as follows:



Although the MC curve above falls before rising again, the change in marginal cost is *always* positive. (For it to be negative, it would mean that total costs at output Q would be more than total costs at $Q + 1$.)

The marginal cost curve is critical in determining what phase in the production process an industry is in: is it facing increasing, constant or decreasing returns to scale at any specific point?

The essential character of ΔMC over the PLC can be summarised as follows:

Increasing returns to scale: ΔMC positive but at $Q+1$, ΔMC is less positive than it was at Q .

Constant returns to scale: ΔMC positive and at $Q+1$, ΔMC is the same as it was at Q .

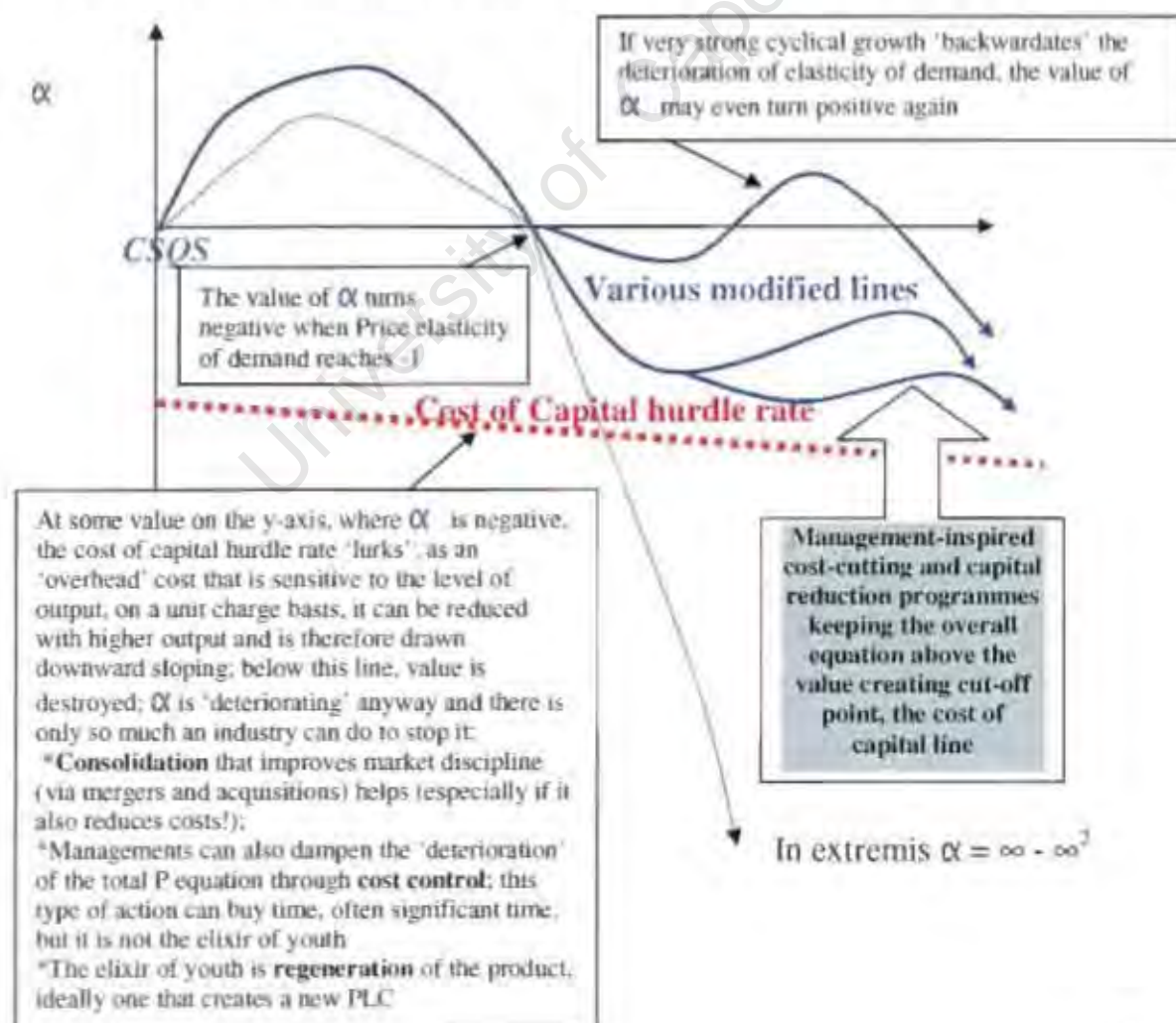
Decreasing returns to scale: ΔMC positive and at $Q+1$, ΔMC is more positive than it was at Q .

Insofar as classic theory of the firm would suggest that constant returns are only reached at perfect competition (a status incompatible with the PLC – see

Section 4h), the practical conclusion one can draw from this is that ΔMC , though always positive, would be a declining positive number while there was still value to be added to the product.

Exactly how ΔMC would affect the 'raw' PLC is shown in the next diagram, which also highlights what can happen if the PLC experiences a cyclical rebound in value-added margins later in its life.

Note that the CSQS and cost of capital lines are *not* conjoined. It illustrates 'raw' pricing power as conditioned by the 'raw' cost structure, that is to say 'circulating capital' representing all costs other than the capital charge.



Once pricing power starts to deteriorate, cost cutting – *which includes reducing the capital charge by reducing the amount of capital employed* – arguably becomes the most obvious way by which a management can postpone the onset of commoditization. This may explain why Ford’s now former chief executive – with his revealing nickname, Jac ‘*The Knife*’ Nasser – got his job and why Gillette has had two cost cutting rounds involving factory closures and staff lay-offs in the past 18 months.¹³³

Network externalities achieve a slowing up – conceivably a reversal – of the erosion of the elasticity of demand. Given the sequence outlined above, one can imagine what a powerful effect this would have on pricing power and profit generation in a highly monopolistic market – such as the provision of software required to write this sentence!

3. Finally what does ‘Q’ represent in the TR equation?

By definition it is the **Cumulative Sequential Quantity Sold** and the ‘neutral’ way of accommodating time. But it also reflects a product’s maturity measuring the level of saturation of the ‘pool of profit’ available before commoditization sets in. This saturation coefficient can best be measured only with hindsight.

There is a valuable extra insight that can be gained by multiplying through the $P = Q \cdot \Delta MC \cdot E_S(1 + E_D)$ equation by Q on both sides. This creates the equation:

$$PQ = Q^2 \cdot \Delta MC \cdot E_S(1 + E_D)$$

¹³³ See respective cases studies in [Section 5](#) below for more details.

And since PQ is total revenue generated at Q level of cumulative sales, the equation can be rewritten as:

$$\mathbf{TR \text{ at } Q = Q^2 \cdot \Delta MC \cdot E_s(1 + E_d)}$$

What is Q^{22} The short answer is a measure of 'volume gearing', a concept used with almost magical reverence by industrialists reflecting the double-whammy that accrues to them through increased sales to profits, assuming a company can match falling costs with that rising sales revenue.

Kalecki's 'degree of monopoly coefficient' ¹³⁴

Embedded in the above equation is Kalecki's 'degree of monopoly coefficient', which is also derived from substituting MC for MR in the equation showing MR as a function of elasticity of demand:

$$\mathbf{MR = P \left(1 + \frac{1}{E_s} \right) = MC \text{ (at profit maximization)}}$$

Kalecki's coefficient representing the 'degree of monopoly' is $\left(1 + \frac{1}{E_s} \right)$

To the extent that $\left(1 + E_s^{-1} \right)$ departs from zero, the firm is said to have monopoly power. However, the above reasoning also suggests that whilst margins (and so by implication monopoly power) might grow at the outset, there will come a time when other factors conspire to peg back that monopoly power. In particular once the elasticity of demand is greater than -1 (which means α falls below zero), the degree of that monopoly power starts to become heavily qualified.

Let us return to the full $P = Q$, ΔMC , $E_S(1 + E_D)$ equation and summarise the main possibilities arising in a tabular form.

- ❖ ΔMC is always positive,
- ❖ Assume the absolute value of the elasticity of demand is always greater than the value of elasticity of supply. By the time E_S has a value of 1 or above (lines 2, 3 and 4 in the following table), the formula has either a zero value or most likely has turned negative when E_D will be 'more minus' than -1 .
- ❖ Assume no cyclical rebounds.

	Assume E_D is...	The Price Equation has a value that is:
E_S just > 0	> 0 to < -1	Positive
$E_S > 0$ but < 1	Exactly -1	0
$E_S = 1$	> -1	Negative
Close to ∞	Closer to $-\infty$	'Very' Negative

So what exactly is a 'Product Lifecycle'?

When the traditional analysis of supply and demand is done, the key assumption is 'ceteris paribus'. And if 'ceteris paribus' is enforced, the demand curve addressed by a profit maximiser would (nearly¹³⁵) always be elastic. But what if the traditional analysis of what happens when supply goes up from S_1 to S_2 (i.e. the normal consequence being that price falls as quantity supplied rises) can **only** be achieved in a time frame during which 'exogenous' demand has also moved outwards from D_1 to D_2 ? Does this 'ceteris paribus' assumption actually hide more than it reveals? The answer suggested here is

¹³⁵ Kaflecki M., 1943

'yes': when the ceteris paribus assumption is *partially* relaxed to accommodate this possibility, another hybrid can occur.

The approach used herein is an attempt to show what happens to both supply and demand during such a discreet time period. What emerges is a segment of the PLC curve; indeed the 'gross' PLC is nothing other than the long-term dynamic 'demand-meets-supply' curve assuming an industry wide ambition to pursue the path of profit maximization.

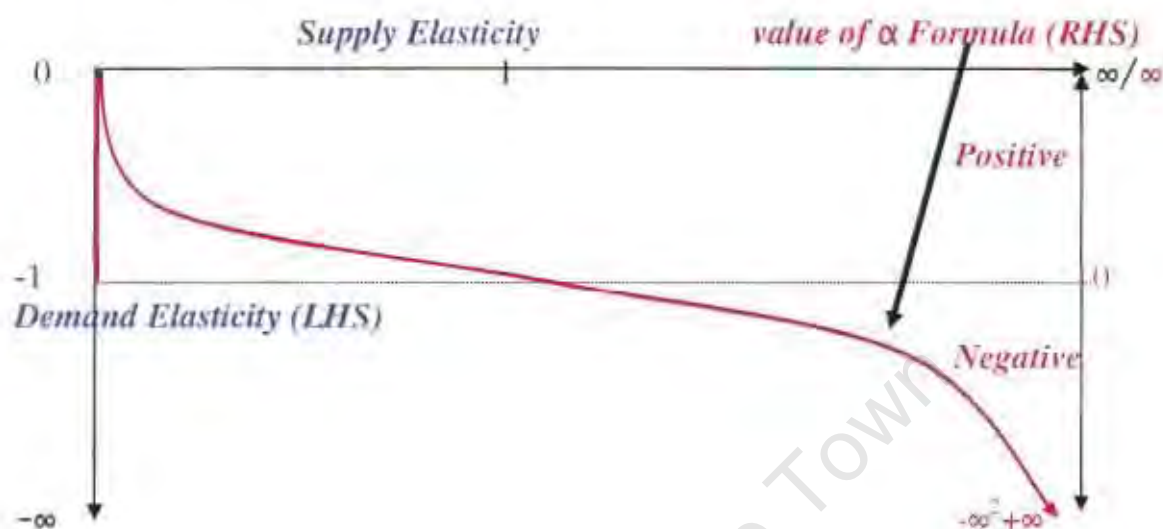
To derive a 'net' PLC, the 'gross' PLC must be adjusted downwards for marginal costs: $P - MC = \text{profit margin}$, which (including a unit capital charge) measures 'value-addedness' on the Y-axis of the PLC portrayal used herein.

This method of looking at the supply story dynamically via the PLC ties back to the logic behind why any investment might be undertaken in the first place: the expectation is that the risk adjusted returns will more than compensate for the costs that must be borne to generate those returns.

This approach presents economics with a dynamic visualisation of profit evolution.

¹¹ The rare exception being the Giffen good

The diagram that follows would represent the 'normal' evolution of the value of α .



N.b. When either E_S or E_D are zero, the whole equation is zero (as it would be at the outset).

The tentative conclusions drawn from this portrayal are:

1. The more price elasticity of supply can resist matching the rising (negative) value of price elasticity of demand, the better it is for profit margins. But there comes a time when the continuing erosion of the elasticity of demand on its own erodes overall pricing power *notwithstanding the best efforts to shore up elasticity of supply*. This is particularly evident once price elasticity of demand crosses the -1 boundary on its way to negative infinity.
2. The closer elasticity of demand approaches -1 , the less likelihood there is that even a disciplined industry will be able to resist margin compression as each extra unit is sold, not least because it is becoming 'harder' to sell that extra unit, and this 'hardness' raises the competitive temperature.

3. The more the value of supply elasticity 'catches up' with the absolute value of demand elasticity, the worse it will be for profit margins.

There is something profoundly disturbing about the above conclusion so far as suppliers are concerned. It suggests that even market discipline among suppliers is sufficient to shore up a product's profit margins if that product's elasticity of demand continues to deteriorate towards (and beyond) -1 of its own accord. This is most likely because, at some point, average market utility – derived from aggregating all the individual utilities over a given period and dividing by the number of units sold in that period – starts to decline. This hints at the onset of 'saturation' of a market's appetite, 'saturation' being defined not so much by the size of the potential market appetite but specifically and narrowly by the level of supply beyond which capital would be destroyed.

In short, an increasingly 'blunted' market appetite helps blunt the sharpness of the elasticity of supply.

This provides evidence to support the conventional view that regular upgrading of a product through R&D and product development helps shore up the erosion of profit margins. This is because it brings the value of price elasticity of demand of the upgraded product away from -1 and back closer to zero. Such a process '*re-invents the wheel*' and technically speaking generates a new PLC.

While cost reduction will help postpone profit margin erosion, **the passage of time and the continued erosion of the elasticity of demand beyond -1 will eventually override even the best efforts aimed at enhancing cost efficiency.** As such, every product faces a form of unavoidable obsolescence in its value-generating abilities if the product's innate characteristics are not

upgraded. No unchanging product, not even a De Beers's diamond, is 'forever'. (After Machlup¹³⁶, this is a form of 'elasticity pessimism' as applied to a good or service which instead focuses on the efficient utilization of that common factor underlying its production: financial capital.)

Although a supplier (or suppliers) can use tactics such as product enhancement to resist the deterioration of market advantages accruing from maintaining the low value of the elasticity of demand, the supply side is rarely static in practice. The real world likelihood is that both elasticities of supply and demand erode in tandem, though at different speeds during different Rounds of the PLC. Suppliers face factors largely beyond their control – most notably those represented by the 'external' nature of the consumer market and the 'internal' nature of industry competition – which suggest that not only is it difficult to forestall the erosion of the elasticity of demand, but that it is not easy to forestall the erosion of the elasticity of supply either. Indeed, not only may these corroding forces work beyond the control of the supplier, they may even 'infect' each other and thus be cross-reinforcing.

In the case of cyclical rebounds, there are 'real world' scenarios where one can see the profit margin of the product rising again, when the rate of erosion of the elasticity of demand 'backwardates'. This happens if suppliers, perhaps collectively, can 'reverse engineer' the erosion of elasticity of supply (or even simply 'hold the line') during a period of strong cyclical demand growth. This may have happened during 1999/2000 when the restoration of an effective cartel in the midst of a global growth spurt allowed OPEC to regain the pricing initiative increasing profit margins on each barrel of oil.

¹³⁶ Machlup F., 1950

xii. Applying the Marshall-Lerner criterion to the evolution of the PLC

The Marshall-Lerner criterion states the elasticity conditions under which a change in a country's exchange rate would improve its external trading position, specifically its balance of trade. The essential definition is as follows:

The condition states that if the current account is initially zero, a real currency depreciation causes a current account surplus if the sum of the relative price elasticities of export and import demand exceeds 1.¹³⁷

The practical aim of this condition is to establish whether devaluation would 'work' by helping reverse a negative balance of trade. 'Working' means extra export sales derived from lower prices when volume adjusted and aggregated into a monetary figure will offset the likely higher import bill as would most likely be occasioned by the devaluation.

The adaptation used herein seeks to measure industry profit (the usual application measures revenues) generated from one period to the next:

Firstly, any circumstance where any rise in a product's price would not so dampen existing demand so that, together with any exogenous changes in demand (most likely growth) and adjusting for any interim changes in unit costs, the net effect would be **to increase the total value-added for the period** as derived from average value-added margin multiplied by the unit sales in that period as compared to the equivalent for the previous period.

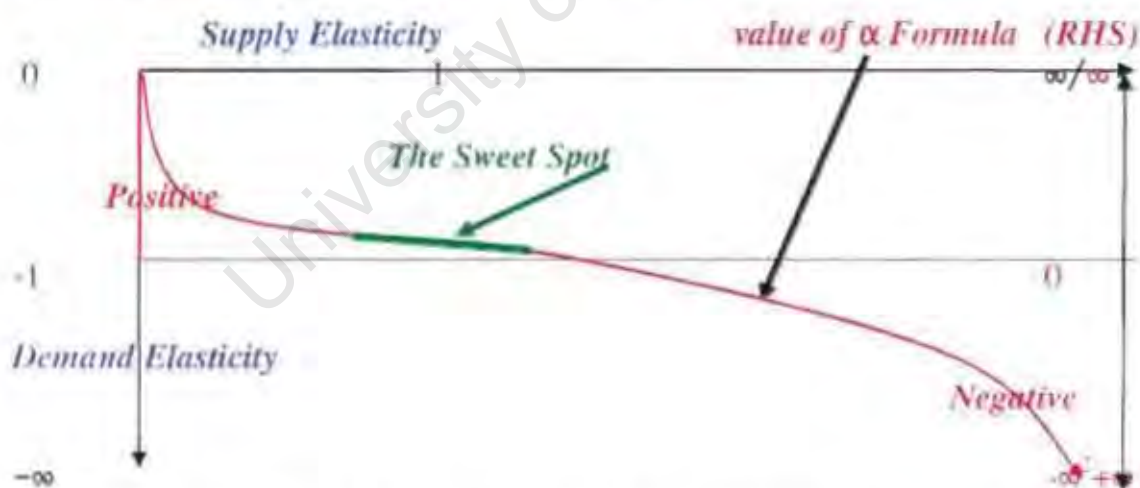
¹³⁷ Krugman P. and Obstfeld M., 1997

Secondly, any circumstance where a **fall in a product's price** would not sufficiently stimulate extra demand so that, together with any exogenous changes (most likely growth) in demand and adjusting for any interim changes in unit costs, the net effect would be **to reduce the total value-added for the period** as derived from average value-added margin multiplied by the unit sales in that period as compared to that of the previous period.

This ensures that, from one time period to the next, the **aggregate value-added** (specifically **NOT** revenue) rises. Unless the industry is still a monopoly, this amount is for the industry as a whole, not a single firm.¹³⁸

The diagram showing the evolution of the α in the normal 'price line' equation over the lifecycle of a product is repeated here as is its summary table.

The diagram representing the evolution of the value of α



N.b. When either E_S or E_D are zero, the whole equation is zero (as it would be at the outset).

¹³⁸ This concept also underlies the discussion that will be developed in the macro section below when the impact of a devaluation on the value-creating abilities – again *not* its revenue earning abilities – of a nation are studied.

	Assume E_D is...	TR equation has a value that is:
E_S just > 0	> 0 to < -1	Greater than 0
$E_S > 0$	Exactly -1	0
$E_S < -1$	> -1	Less than zero
Close to ∞	Closer to $-\infty$	Less than zero

The horizontal dotted line in the middle of the diagram represents the limit of where, *for the industry as a whole*, the tactic of increasing value-added margins through selling that extra unit would 'work' in Marshall-Lerner terms: beyond this line, the value of the α Price Equation would be negative.

This issue is complicated by the fact that, for a given product, there are a number of firms, whereas the traditional application of Marshall Lerner deals only with a single country (though made up of many exporters and importers in its foreign trade pattern.). Even so, a firm would generally know it was in the 'dotted line' neighbourhood when it was forced to change its strategy and go for volume growth in an attempt to compensate for margin deterioration that was being forced upon it. The price-cutting strategy adopted by Dell (and highlighted above) suggests that this computer seller realises that it is in this danger zone, and has reacted accordingly: its aim appears to be to get a larger share of a shrinking profit pie thereby maintaining its growth, though ultimately this is, like the Cheshire Cat's smile, a self-liquidating option.

For as long as such a strategy is 'successful' as measured by growth in sequential annual profits, a firm may 'disguise' the sea change implicit in entering into the zone around the horizontal dotted line. But it means an even heavier bias towards what it is often revealingly called *growing throughput*.

Although revenues may grow appreciably, the issue here is to see aggregate value-addedness grow. If, in a given period, the aggregate savings from lower unit costs only matched the aggregate profits foregone recorded on the new sales made at the lower price, the firm would be facing the Red Queen dilemma¹³⁹. In Carroll's *Alice through the Looking Glass*, the Queen remarked:

Here, you see, it takes all the running you can do, to keep in the same place.

To increase the next period's profits, the industry would presumably have to run even faster than '*all the running it could do*', which it could not, and as such (real) profits would plateau before declining.¹⁴⁰

This zone encompasses, so far as competition is concerned, the heat of the battle and pinpoints Sraffa's dilemma:

*The chief obstacle against which they (businessmen) have to contend when they want gradually to increase their production does not lie in the cost of production but in the difficulty in selling the larger quantity of goods without reducing the price...*¹⁴¹

Most businessmen today would concur – with the minor refinement born of resignation to the modern inevitability of falling unit prices – that their aim is rather to preserve margins, a fact which *does* mean that businessmen are

¹³⁹ The Red Queen Hypothesis was first advanced and applied by van Halen L., 1973

¹⁴⁰ Ridley M., 1994

¹⁴¹ Sraffa P., 1926

simultaneously concerned with getting unit production costs to fall as their volume of output rises.

Declining profits start to happen for the industry in the danger zone around the dotted line. Thereafter, only a very efficient firm – cutting unit costs, lowering its capital charge through share buybacks and capital reductions – can hope to see year-on-year profits rise; to quote the Red Queen again:

If you want to get somewhere else, you must run at least twice as fast as that!

Running twice as fast as anybody else may yield higher year-on-year profits, but it will be achieved at the expense of someone else in the industry; Dell's profits in 2001 will almost certainly be achieved at the expense of HP/Compaq, Gateway and others.

My mentor in the fund management business taught me the first two questions to ask managers of a typical industrial company like a brewery were:

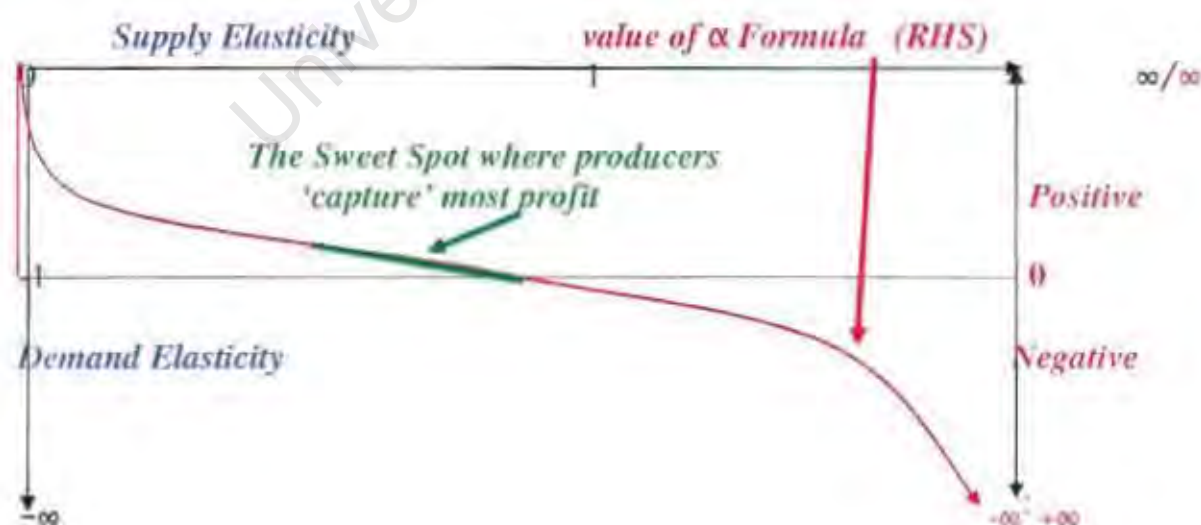
1. *What has happened to volumes in the past year?*
2. *What has happened to margins in the past year?*

If volumes had grown above GDP growth without margin contraction, the company was a definitely a candidate for inclusion in a portfolio, if the share price was right. (Essentially a company in the top half of the evolution of the value of α diagram.)

If volumes had grown sufficiently to compensate for margin decline, the company was still making progress overall and might be a candidate for inclusion in a portfolio, *if the share price was right*. (But such a firm would be closer to and may even have crossed the 'dotted line' above.)

If volume growth could not make up for margin decline, the company was 'swimming backwards' and so almost certainly was not a candidate for inclusion in a portfolio, *almost regardless of the share price*. (Now in the bottom half of the diagram; conceivably facing commoditization.)

What this chart (repeated below) would also tend to suggest is that the widest profit margin must lie somewhere in the first section of the curve – the sweet spot identified previously when discussing where on the demand curve a far-sighted profit maximiser would like to position herself in a growing market. In this range, the sum of $(E_S (1 + E_D))$ is still positive therefore making the overall Price Equation positive.



What the above diagram also illustrates is, in its top half, suppliers *gain purchase* on the market by capturing value from consumers in the form of profit margins; this is herein called having '*corporate pricing power*'.

In the bottom half, after α has crossed the dotted line representing the fact that elasticity of demand is now greater than -1, it is the consumers who *regain purchase* on the market by recapturing those profit margins back and consuming them in the form of extra utility. This sense is what we normally call '*consumer purchasing power*'.

It is as if, above the dotted line, suppliers are using a crowbar to lever profit margins out of consumers, and below it consumers are using their own crowbar to 'regain purchase' and lever the equation back into their favour. The market cliché, '*Capturing value*', takes on new meaning in this light.

This completes the section on elasticities as they directly affect the shape of the PLC. In passing, this section commented directly upon two of the other factors that go into determining the shape of the PLC: competition (by way of its measurement of relative scarcity) and costs (by way of its investigation into economies of scale). The next two sections, Sections 3h – C and 3h – D make additional comments on competition and costs respectively. Sections 3h – E and 3h – F respectively comment on issues surrounding product regeneration and the changing assessment of capital markets as the PLC evolves.

3h – C) The Influence of the Competitive Environment

Marx wrote that *'The battle of competition is fought by the cheapening of commodities'*¹⁴². In terms of this thesis, he might have instead written *'The battle of competition cheapens products until they become commodities'*.

i. *Market contestability as a measure of Pricing Power*

One of Kaldor's 'stylised facts' that underpins this thesis is that over the lifecycle of a product, as it goes from being a differentiated product to a homogenised commodity, the industrial organization behind a product *tends* to evolve from being a near monopoly to exhibiting some of those symptoms associated with that still unattainable world of perfect competition.

ii. *Overlaying the PLC with the drag of competition*

It is not possible, even in the 'mechanical' summary of **Section 3f)** covering the evolution of the PLC, to ignore the shadow that competition casts over pricing power. This is because anything that compromises scarcity compromises pricing power. And competition does nothing if it does not compromise scarcity. This means Marx's *'Battle of Competition'* helps undermine pricing power from within, acting as a negative drag offsetting what upside pricing power an industry can gain from its tussles with consumers for their spending power. Indeed, competition gradually plays into the hands of the consumer. The self-interest of each supplier – so famously lauded by Adam Smith – eventually drives an unchanging product towards commoditization.

'What happens when' in terms of the interaction of competition with the PLC has been introduced in [Section 3g\)](#) detailing the six Rounds that underlie the micro case studies. This is also developed in [Section 3h – F\)](#) below which focuses on how owners of capital tailor their behaviour according to which Round is underway or might soon begin, given investment lead-times.

For now, the following observations are relevant:

Understanding the PLC's inflexion points and maxima.

In calculus, the first inflexion point on the rising part of a lifecycle-style curve has a relatively straightforward explanation: it occurs when those forces opposing the upward forces *visibly reveal* themselves by beginning to moderate the rate of change of the curve.

In the PLC, one might think of this point as where the Law of Diminishing Returns first reveals itself. Before the inflexion point, adding further capital increases the return on a project at an ever-increasing rate; after it, the extra unit of capital still increases the rate of return but the rate of increase starts to diminish. (Another force within this evolutionary process – whose specific influence on the PLC would be hard to isolate – would be the market-wide aggregation of the Law of Diminishing Marginal Utility, in particular reflecting the rate of change that demand would be moving towards saturation.)

What competitive events might the lifecycle be *visually acknowledging* at this first inflexion point?

¹⁴² Marx K., 1867

By now, it is likely that monopoly has been compromised (or seems certain of being so). Widening profit margins act as a magnet to competition. The Second's Out Round is most likely – for a product that leads a full value producing life – to begin *before* the top of the PLC is reached. This will end the monopoly rents of the Splendid Isolation Round and start to ease the 'artificial' scarcity thus far manipulated by the monopolist.

Once barriers to entry have been breached once, so possibly third, fourth and more players will enter the market. Where profit margins remain good, financiers will back new competitors with their financial capital. Eventually intensifying competition will act as a drag on pricing power by reducing relative scarcity prompting real and possibly even nominal prices to fall. Competition thereby aids and abets the consumer's cause, and once the PLC's maximum has passed, even undermines the cause of the industry it represents.

The Maxima

Extending the above reasoning, one might regard the maxima in the PLC as the point at which the Law of Diminishing Returns – aided by the Law of Diminishing Marginal Utility – starts to dominate the benefits of scale at the margin. The extra capital now being added by all players in the industry does not earn the incremental returns it did previously, notwithstanding the likely continuing reduction of marginal cost with each new sale.

Where Competition becomes cutthroat

At some point, most likely after the maxima of the PLC, the rise of surplus capacity in the industry signifies that the industry's power to regulate scarcity

by limiting supply is ending. If competition has not become cutthroat before this point, it will almost certainly become so now as a new form of scarcity starts to compromise suppliers – *the vanishing availability of value-addedness* – as too many cooks spoil the market broth. Note also that between the maxima and the second inflexion point, both the primary and secondary trends in the PLC are moving against producers. This suggests *all* the forces opposing pricing power – the external pressure of purchasing power, the internal drag of competition – are aligned against pricing power during this period.

The end in sight?

After the second inflexion point, the second derivative 'rate of change' interplay of forces reverses. Despite the continued absolute strengthening of the Law of Diminishing Returns and its allies versus the benefits of scale and its allies, the relative rate of that strengthening is now slowing. Though this may be cold comfort to suppliers, *at the level of the rate of change*, the forces are actually moving back in their favour.

In terms of the PLC, this means a *visual* recognition of the growth of purchasing power *not* being so demanding at the margin, of pricing power *not* deteriorating so fast and the rising intensity of competition *not* being as pronounced as it might have been before.

All these causes have plausible explanations – that demand was beginning to feel the influence of market penetration limits (the more commonly used variant of the 'saturation' concept), that consolidation in the industry was creating a modicum of market discipline, and that new entrants (and the

suppliers of capital behind them) were no longer being attracted to the product's value-added margins to the degree they were before.

In Round V and VI case studies below – Ford and Cargill – it will be shown that industry concentration for near-commoditized and commoditized markets can be high *and rising*. There is nothing like the prospect of a hanging to concentrate the mind. So it is with markets; there is nothing like the prospect of the 'hanging' implicit in commoditization to concentrate an industry.

A plane descending back towards earth experiences a form of resistance known as the 'ground effect': *'as an aerofoil approaches the ground its lifting ability increases and the drag reduces'*. So industries might experience their own form of 'ground effect' – the managers of a firm's capital would not be acting rationally if they added more investment to their 'plane' as it headed straight for the ground. Neither, given such a trajectory, would it be logical for outside financiers to climb aboard with fresh capital. If acting logically, both would do the opposite. Managers will jettison capital if they can; owners of capital retained on board will ask for it back. This 'ejection' will be done by way of dividends, share buybacks or other capital enhancement schemes. Ford has long pursued such a strategy of using its prodigious free cashflow to reduce the equity capital employed in its business – a strategy which has the additional advantage of 'lightening the load' implied by the capital charge it must take against that residual capital employed thereby giving it a greater chance of remaining value-creating and so aloft.

In such circumstances, it would be logical for the glide path of the PLC to become gentler, thereby 'delaying the date with commoditization' though not avoiding eventual 'touch-down'.

When Competition becomes ‘irrelevant’

Once a product becomes commoditized, competition is largely irrelevant: What use is even 100% market share if a company could not make a true profit? The only residual relevance that competition might have in such circumstances is that it tends to ‘hold the product hostage’ preventing the industry from regaining its value-creating status.

iii. The changing emphasis of US Anti-trust judgements

The ‘irrelevance’ of near-monopoly in commoditized markets is reflected in the growing importance of ‘contestability’ as the determining factor of market abuse in US antitrust decisions. There has been increasing recognition that the number of players in an industry is not necessarily the key determinant of whether market abuse is taking place.

*The Herfindel-Hirschmann Index...is nowadays dismissed as irrelevant, except as a preliminary screening device.*¹⁴³

In the auto market, there was little likelihood that Daimler buying Chrysler would fall foul of the US anti-trust authorities. Furthermore, within the past two years, the US authorities all but nodded through Cargill’s acquisition of Continental Grain to give the combined entity a 60% plus market share in US grain trading (see Cargill case study below). This was done on the grounds that grain trading was an industry operating under razor thin margins and, given that barriers to entry were so low, there was little likelihood of Cargill being able to

¹⁴³ *The Economist*, 7.10.2000

exercise excessive monopoly pricing power. In short, the contestability of the market remained high even though industry concentration was also high.

But for products close to the beginning of their PLC, anti-trust rulings are still being made against companies that use the sharp blade of pricing power to gain unfair market advantage. Notwithstanding its rejection of Judge Jackson's ruling and the 'soft' resolution of the Microsoft case, the Appeals Court in the US *did* find the company guilty of abusing its monopoly position. 'Co-mingling' of other software with the Windows platform was deemed anti-competitive: Microsoft engineered a market space that was not 'contestable' for other software suppliers.

Jagdish Bhagwati colourfully sums up the issue of 'contestability'¹⁴⁴.

You often assume that monopoly power has increased just because the share of the larger companies in some industries has increased. But this is not the way to measure monopoly power. If a company exercises its monopoly power and makes monopoly profits, other corporations will soon enter the market, seeking those excess profits, like bees to the honey pot. Economists, therefore, no longer look at market share but instead ask how 'contestable' a market is.

Looking around the world it is hard to find much evidence of persistent 'excess' profits. But when you say that that both Darwin and I forgot that someone wins in the competition, and that, and therefore, monopoly must follow, you miss the point I was making: winners cannot rest on their laurels if the markets can be contested by new entrants. Maria Callas, the greatest diva of her time, must worry about Renata Tebaldi if

¹⁴⁴ Bhagwati J., 2000 from an article in *Prospect*, December 1999

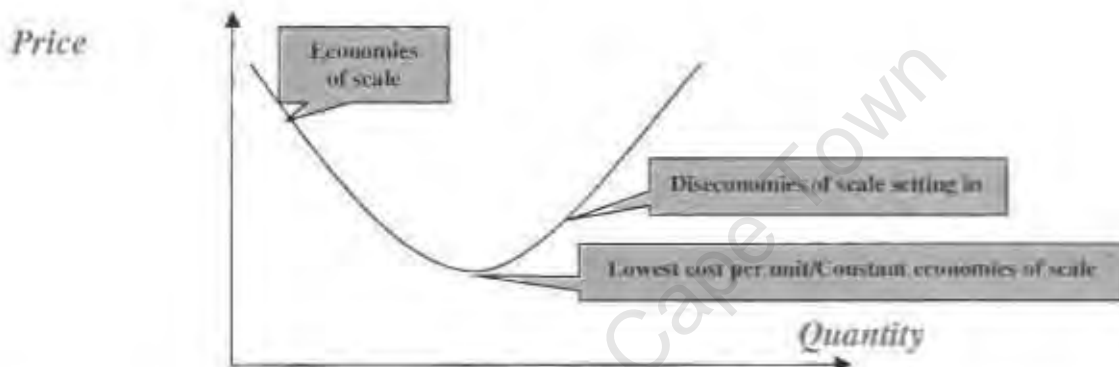
she drops a high note. The monopolist must always watch out. That's the beauty of it.

The coming of commoditization in an industry is almost certain to lead to the bulking up of the leading players through either acquisition or merger. In investment banking jargon, the politically sanitised rationale cited is that '*this allows the combined entity to eliminate cost overlaps and get further down the cost curve*' thereby allowing them to counteract continuing margin squeezes with a cost squeeze. This consolidation trend is evident in a wide variety of industries – commercial banking, auto assembly, tobacco and brewing – all of which are arguably feeling the chill winds of commoditization.

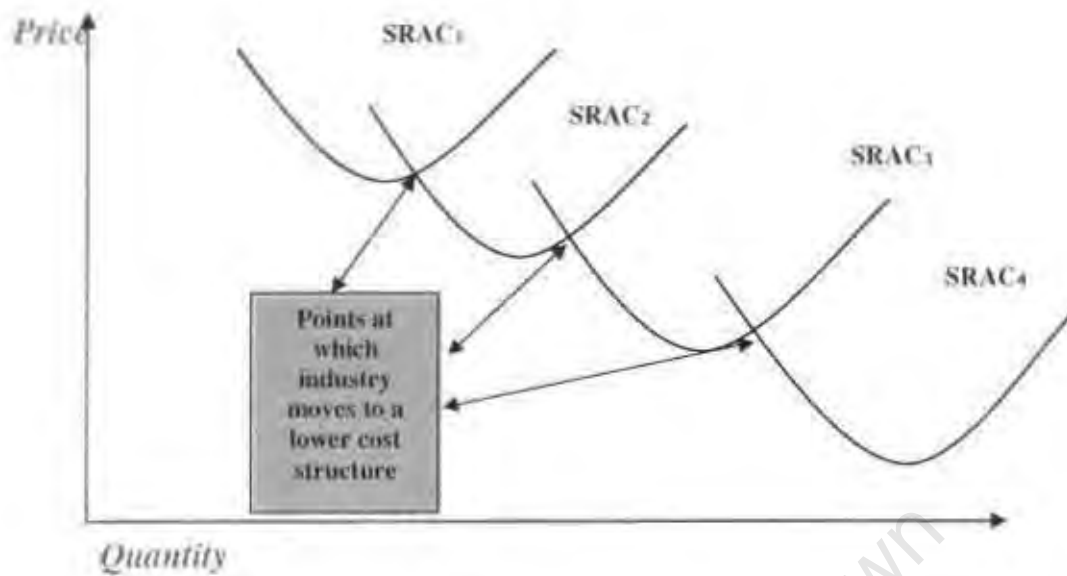
When margins get squeezed – especially when an industry has 'gone over the top of its lifecycle' – there is a categorical imperative, arguably built on the corporate equivalent of the instinct to survive, to seek consolidation. With apologies to Herbert Spencer, this replaces 'the survival of the fittest' with 'the survival of the fattest'! Unfortunately for industrial dinosaurs, this tactic rarely succeeds except perhaps in buying time.

i. The evolution of the long-run average cost curve of a product.

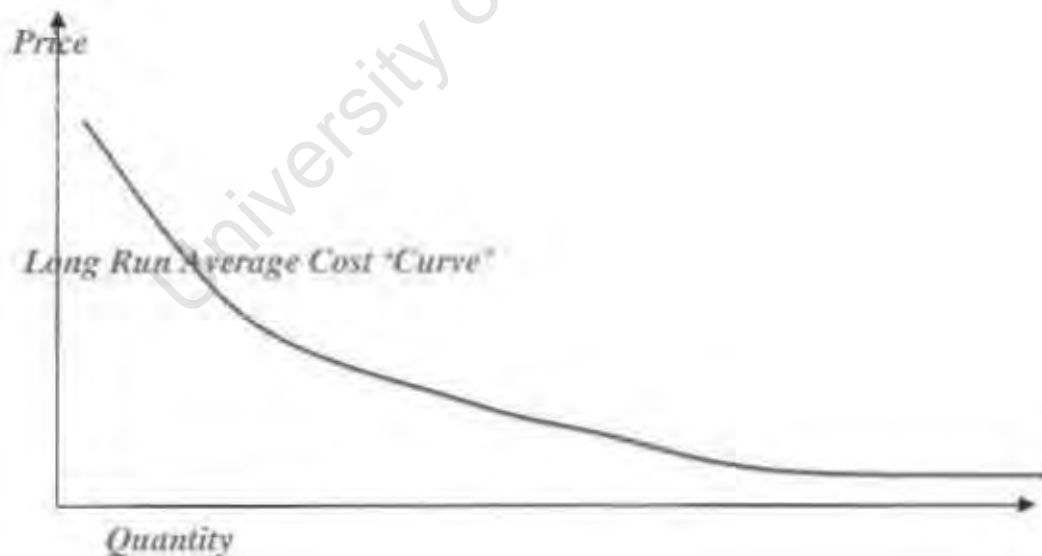
In the shorter term, an average cost curve is typically U-shaped. Initially, economies of scale reduce unit costs. At some point, diseconomies of scale generally start to operate, and thereafter the curve rises, *ceteris paribus*.



The *ceteris paribus* assumption is all-important. If the technology behind the making of the product or the logistical system by which it is distributed improves, the cost of delivering the end product to the consumer can fall and the industry re-invents its underlying cost structure. Over the PLC, this can happen a number of times. *Theoretically*, the process would look as follows:



In the real world, a long-run average cost (LRAC) curve that would represent a weighted average of the underlying short-run average cost curves (SRACs), the downward slope reflecting innovations and organisational improvements that lower the cost of production.¹⁴⁵



¹⁴⁵ Viner J., 1931, with particular reference to the 1950 *Supplementary Note*, reprinted in Kamerschen D.R., 1969

Contemplating the possible existence of such a long-run average cost curve, an efficient supplier would aim to 'get down it', in part by re-engineering production and distribution formulas. Achieving this generally entails not only producing more output on an annual basis but *critically* maintaining high capacity utilisation.

In terms of the way the underlying cost structure helps shape the PLC, one can understand how in the early Rounds, a normally shaped LRAC curve would give added amplitude to the PLC by adding to suppliers' pricing power – that difference between sale price and unit cost.

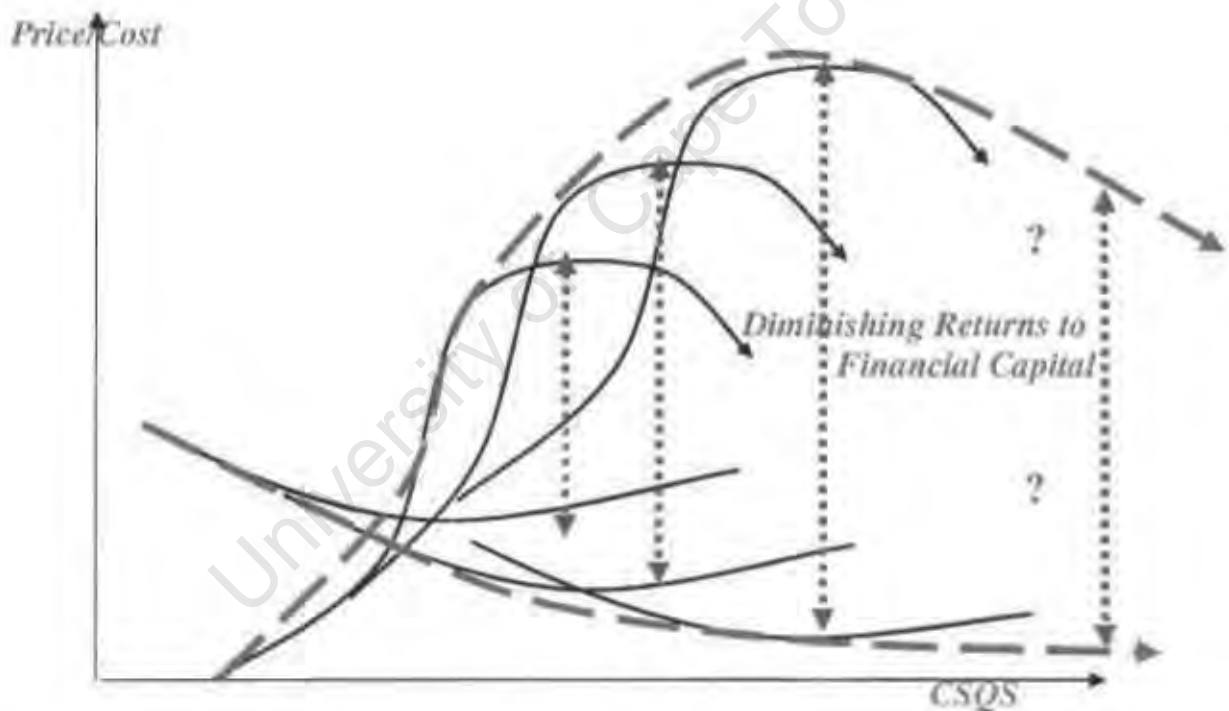
In the later Rounds, one cost reduction option is equity capital reduction. Share buybacks or other forms of capital givebacks reduce the unit cost of capital charge. But this is ultimately a self-liquidating option.

For information goods, where the marginal variable cost of the second unit sold is zero, the PLC experiences a sharp rise in its early evolution. *But note that the change in marginal variable cost at the third sale and beyond is negligible – that no further pricing power gain is possible from lower variable costs.* If variable costs were the only contributor to total costs and all fixed costs were treated as 'sunk' (a questionable accounting tactic), increasing returns operate *only* for the second unit sold, and constant returns operate thereafter.

The 'normal' PLC would see declining average costs adding to its amplitude during its earlier rounds. In Round IV, when market indiscipline starts to erode 'raw' pricing power, falling nominal prices may reduce value-added margins if the LRAC curve has started to flatten out. This would reduce the incremental gain coming from falling costs at the margin. Management then often redoubles

its efforts to reduce costs further. As other areas of margin determination are increasingly circumscribed, cost reduction is one of the few remaining areas where managements can have impact.

The shape of the long run average cost curve may have a matching equivalent on the upside – the higher prices that would generally result from re-inventing a product through innovation¹⁴⁶. Below a family tree of individual PLCs is set against the LRAC curve. This could well portray the history of Razor Blades under Gillette.¹⁴⁷



The net effect is first to widen the value-added margin – the green dotted line – as the PLC evolves. (n.b. *price/cost not value-addedness* on the y-axis). But will a combination of an end to increasing returns to scale on the bottom end of

¹⁴⁶ See also next Section 3h – E]

¹⁴⁷ See Gillette case study in Section 5 for more details

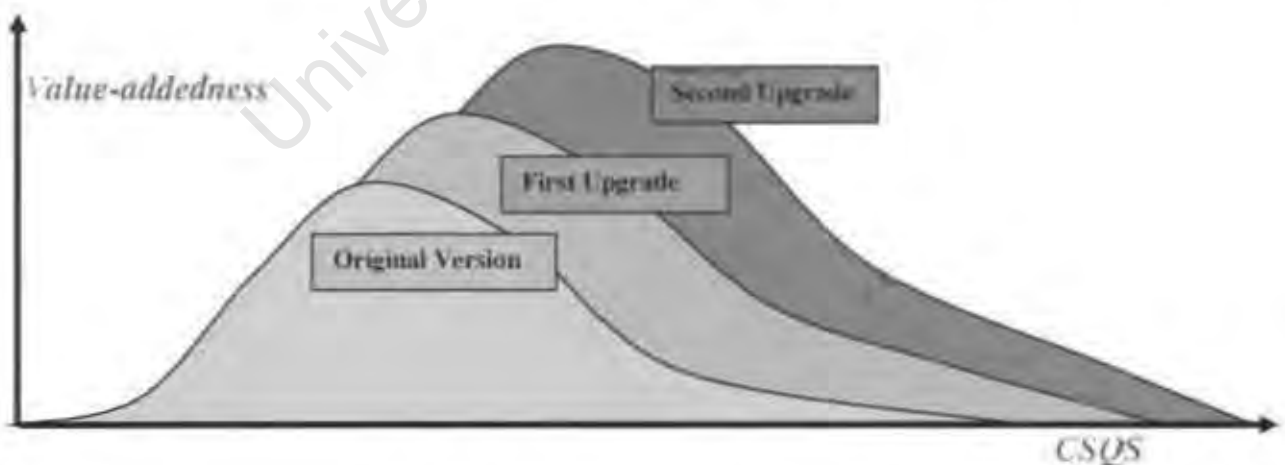
the margin with the advent of market-wide diminishing marginal utility at the top end – these two trends represented by the long run red dotted lines – conspire eventually to diminish returns to capital from the value-added margin?

The Law of Diminishing Returns – as it relates to the returns to the extra unit of *financial capital* – is likely, as *part* of the factors that go into determining it, to be conditioned by a combination of these pressures.

3h – E) The Possibility of Product Regeneration

In its strictest definition, the PLC portrays exactly the same product and not one whose innate characteristics are improved. That noted, continuous product ‘regeneration’ is one of the main strategies for the avoidance of commoditization; this is reflected in the ‘family tree’ of PLCs shown as ‘S’ curves.¹⁴⁸

The lifecycles of a product being continually ‘regenerated’ or ‘versioned’



This matter is covered in detail in the case studies. What emerges is that regeneration cannot be left too late. Microsoft is famous for ‘cannibalising’ its own product range – it ‘cleans its Windows’ at least every two years. Gillette, having sat on its razor design lead in the 1980s, nearly lost its market to the disposables before the Sensor line rejuvenated and regenerated it for them in 1990. Henry Ford thought that sticking with winners that could be ‘any color so long as they were black’ was sufficient; the 1924 launch of the Chevrolet by General Motors proved him wrong.

Leaving regeneration until Round V may be leaving it too late – the low level of profits then available to finance any R&D might not be sufficient to buy the upgrade ticket for the next Round of competition. This reason, more than any other, was why Chrysler sold out to Daimler-Benz.¹⁴⁹ This ties in with Schumpeter’s observation that monopoly rents are needed to finance the next level of innovation.¹⁵⁰

3h – F) The Influence of Capital Markets on the Cost of Capital

i. *The financial nature of the cost of capital line.*

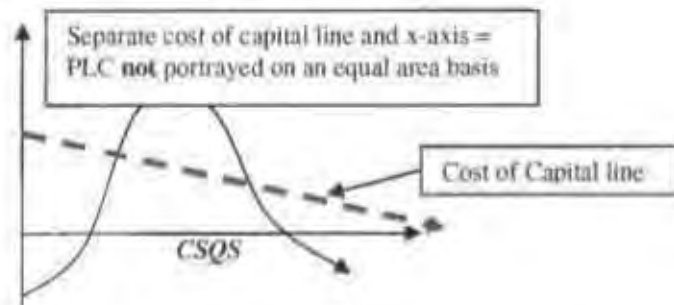
If one extracted *just* the unit cost of equity and debt capital from the value-addedness portrayal above (leaving all other unit costs still being deducted), the cost of capital line would no longer be conjoined with the x-axis. In broad terms, the ‘gross’ PLC and cost of capital lines would then be portrayed as

¹⁴⁹ As dealt with in the above sub-section, improvement in the efficiency of the cost structure underlying the *same* product – what the Japanese call ‘*Kaizen*’ – is absolutely permissible in the understanding of the *same* PLC.

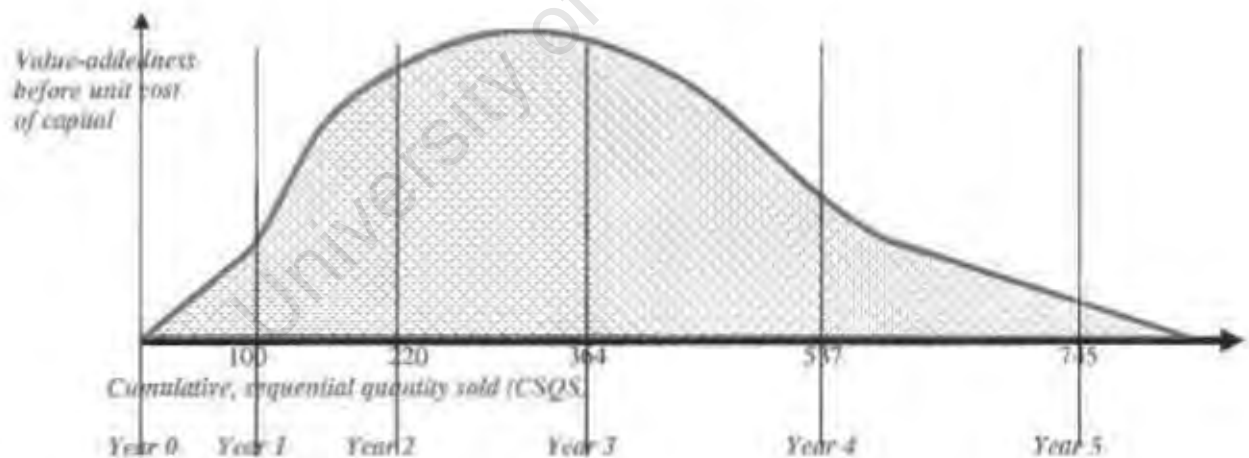
¹⁴⁹ *The Economist*, 5.8.2000

¹⁵⁰ Schumpeter J., 1942, esp. Chapter VIII

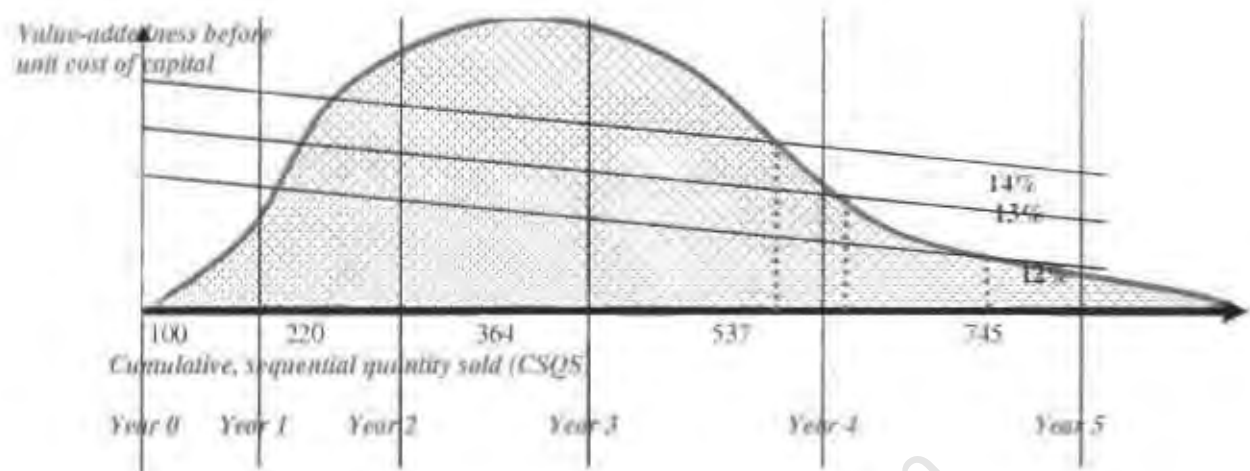
follows, *but critically as viewed from the start point* (Y-axis is value-addedness **before** cost of capital deducted):



Identifying separately the cost of capital line helps understand its nature. Assume an investor is considering a prospect with the following 'gross' PLC profile, *before* taking into consideration the cost of capital but after other costs have been deducted: a product that sells 100 units in its first year of output, with 20% compound annual growth for four years thereafter.



Assume the investor decides to discount this return profile by three different costs of capital – an optimistic case of 12%, a likely case of 13% and a base case of 14%. This could be portrayed by superimposing these costs of capital lines on the above chart (Exact positions of lines not to be taken too literally.)



The cost of capital lines are drawn as downward sloping for one main reason: as time progresses, asset values depreciate. The capital charge is calculated from multiplying the cost of capital against the capital still employed. On a per unit basis, this declines usually over time, as the invested capital is akin to a fixed cost that can be defrayed over larger volumes of output.

The above pinpoints three different points of commoditization depending upon which cost of capital is used: the base case (14%) sees commoditization occurring after output of some 500 units, towards the end of the fourth year. The likely case (13%) sees this happening early in the fifth year at around 550 units. The optimistic scenario (12%) sees this occurring half way through the fifth year at about 680 units.

In short, commoditization could occur anywhere between 500 and 680 units and over the course of a full year. This region is difficult to pinpoint even when a company is *in* it, let alone in advance. This is because it is not always possible to know *exactly* what a company's cost of capital is; mining companies tend to look at average WACCs over the economic cycle, the most

recent of which lasted 10 years. (This grey area adds to the confusion that may surround a management's unwillingness to accept the fate of commoditization – 'but we only use an 11% cost of capital, not 12%' or 'this was an unusually bad year for sales' might form the basis of their rebuttals.)

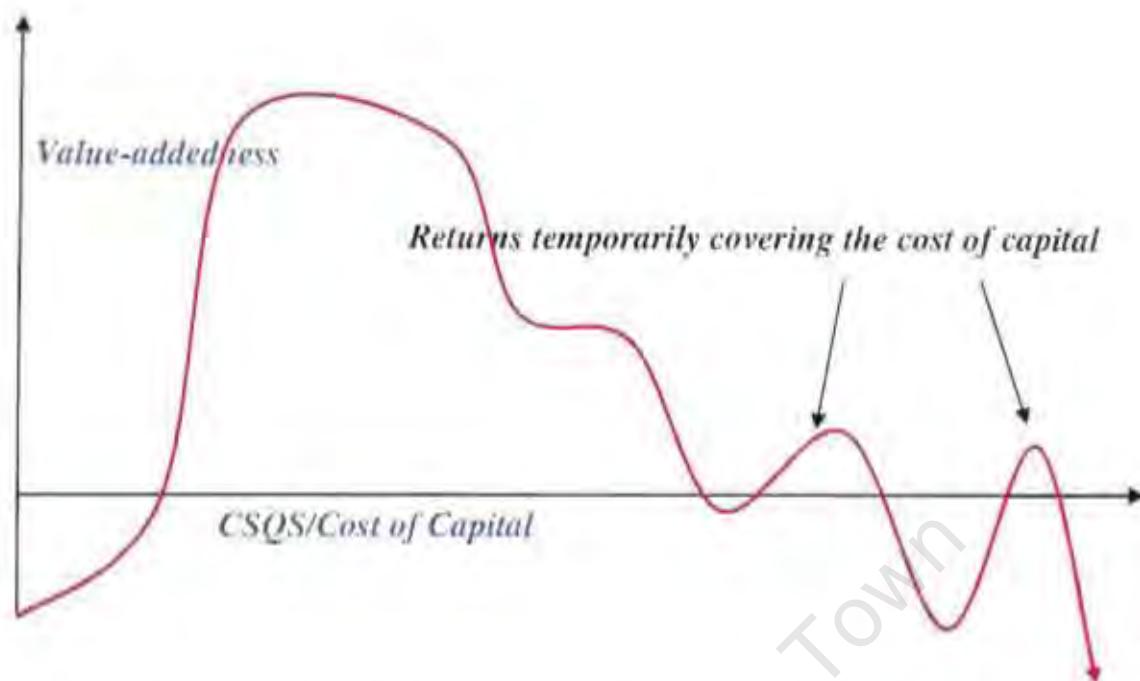
ii. Cyclicity: the outcome of volatility as reflected by the PLC.

The characterisation of the cost of capital line as being 'straight' is **not** what happens *during* an investment's life, even if this is the 'average' assumption employed *upfront* during the project appraisal stage. Most obviously, a cost of capital line will fluctuate over the economic cycle as a result of rises and falls in the interest rate regime and changes in the risk-free rate.

*When assessed during a PLC, as a **percentage** charge, the cost of capital more often rises than falls even if the declining level of capital employed means that the nominal value of the charge declines per unit of output.*

This fact is obscured when the cost of capital line is conjoined with the x-axis. Such a portrayal method serves to increase the volatility of the residual net value-added or destroyed PLC, a volatility that increases the 'cyclicity' of the product. For the producing company, this is reflected in the 'beta' component of its equity risk premium and thereby its cost of capital.

In PLC terms, a product's profit margins will fluctuate with the economic cycle and, as the PLC progresses, this cyclicity usually becomes more pronounced. Comparing the cost of capital line (the x-axis) and the net value-added of the PLC might produce the following curve, *assuming late life cyclicity*,



In the first instance, this shape could arise for two interrelated reasons: the first being the likelihood of *prices* rising towards the top of an economic cycle as spare capacity declines and suppliers benefit from a tighter market; the second reason being the likelihood of unit *costs* falling at the peak of a cycle as output moves towards capacity utilization thus enabling the supplier to access a lower point on the average cost curve. The double whammy of such a combination would simultaneously widen the value-added margin from the top end due to price increases and the bottom end due to falling unit costs. Take the example of the pulp and paper industry; as the economic cycle improves, this industry goes from famine to feast as operating margins go from being very thin (often negative) to being very positive.

There is a second, deeper reason why the volatility may also rise – a vicious circle begins to establish itself whereby cyclicity raises the beta which raises the cost of capital which amplifies the volatility of value-addedness even further and so on round again. This is one dimension of the 'Commodity Trap'.

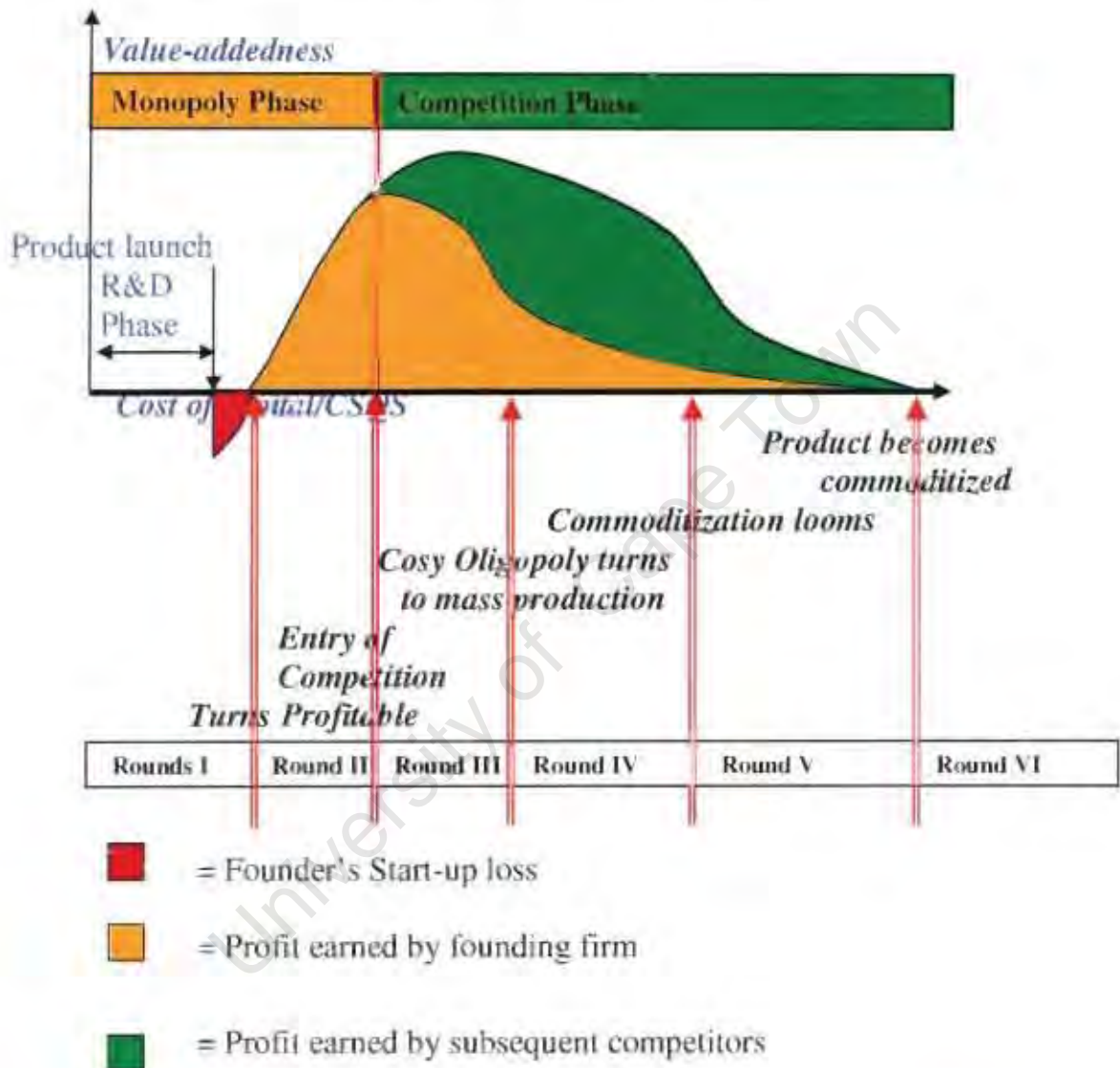
This all leads to financial market analysts tagging a company facing such circumstances as a 'cyclical'. During the 1990s in the US, cyclical stocks proved far less popular counters for long-term investment than did 'value' or especially 'growth' stocks.¹⁵¹ Generally speaking, the more commodity-like a good or service, the more cyclical its industry is likely to be. As a rule, a cyclical company faces a higher cost of capital than would a growth company.

iii. The capitalist's eye view

What helps define each Round is the evolving competitive structure underlying the industry supplying the product. The owners of capital looking for investible opportunities will view each Round differently and tailor-make their responses accordingly.

¹⁵¹ As has been illustrated by the performance of such stocks during the past six months, they are often 'late cycle' performers as they come into their own as capacity surpluses decline; even more important however is the 'defensive' subset of slower growing stocks their underlying cashflows usually translate into higher dividend yields, a characteristic favoured by many investors during economic slowdowns.

The diagram below summarises the main events in the lifecycle of a typical product as might be viewed by the providers of capital.



By way of introducing the six companies that will be profiled in [Section 5](#), the following would be noted:

Round I: This case study does not so much cover the company VA Linux as *the IPO that launched VA Linux* on the stockmarket. The issue attracted wide

investor interest and '*sold like hot cakes*', briefly valuing this recent start-up at over \$10bn. Revenue growth was forecast to be significantly above market average but the company was unprofitable. The combination of a promising future but one that had yet to produce profits above the cost of capital is the hallmark of a Round I company.

The cost of capital implicit in the VA Linux IPO was miscalculated at effectively 'zero', a by-product of the 'irrational exuberance' that surrounded this issue.

Round II: This Round's candidate was an obvious choice: Microsoft is splendidly isolated in Seattle and a *profitable monopolist* – the hallmark characteristic of Round II. When their stranglehold on operating systems is broken, Microsoft will move to the next Round. But until then, Microsoft will remain highly regarded by outside investors, as it is a highly profitable company with above average growth prospects. Its cost of capital would likely be very close to the underlying risk-free rate Treasury Bill yield.

Round III: The recent concession by De Beers that the diamond cartel is no more makes it an ideal candidate for the Second's Out Round. There is now a competitive fight in the gem diamond 'boxing ring' even if the heavy hitter is still a profitable ex-monopolist. Though De Beers has now been taken private, most insiders expect it to be reborn as a quoted Tiffany II within three to five years. Such luxury goods companies typically achieve earnings growth well above market average, earn the epithet of being a 'growth' stock and so trade at significant premiums to the market. Such a premium rating would imply a cost of capital that would still be lower than the market average.

Round IV: Gillette, one of Wall Street's star performers in the 1990s (market capitalisation rose 20 times between 1986 and 1998) and the undisputed leader of the oligopolistic market that characterises razor blades, has experienced 15 quarters of downward earnings revisions suggesting that the company is going ex-growth. Its ratings have fallen below the market average, earning it a 'value' stock epithet. A company that is on the cusp of falling from being a 'growth' to becoming a 'value' stock defines the 'Cracks in the Wall' Round.

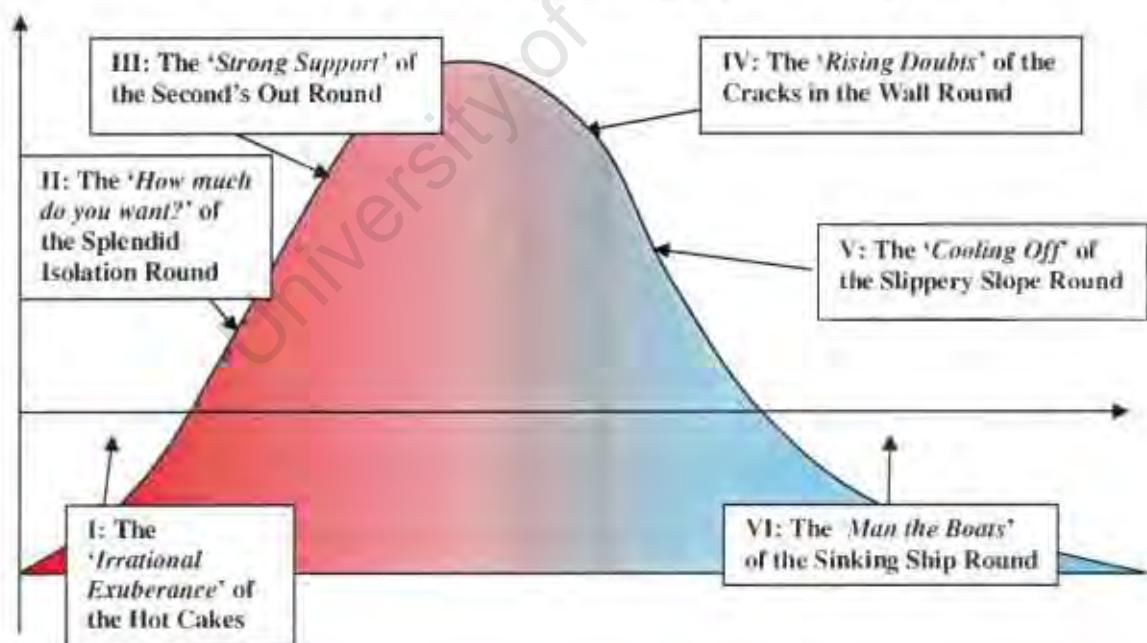
Though strong cashflow still supports Gillette's debt rating, the equity risk premium component in the determination of Gillette's overall cost of capital would be rising, as would its overall cost of capital as compared to the market average. This would reflect the growing cyclicality (which implies volatility and therefore risk) in its earnings profile.

Round V: With a price/earnings ratio that is typically less than half the market average¹⁵², Ford is an industrial 'cyclical'. In 2000, it was *just* value-creating, but its growth prospects are a prisoner of GDP growth. The auto industry, though concentrated, is characterised by the intense competition that has traditionally been **assumed** to exist more in the world of perfect competition than even oligopolistic competition. Notwithstanding Ford's huge revenues, it is on the Slippery Slope to commoditization. The stockmarket senses this; one of the corporate giants of the 20th Century, Ford did not make Institutional Investor's Global 100 largest companies by market capitalization in 2001.

Ford's cost of capital, notwithstanding its size and overall credit rating, would be higher than a less cyclical, more growth-oriented stock because of its earnings volatility and the impact that this has on the 'beta' measure in its ERP.

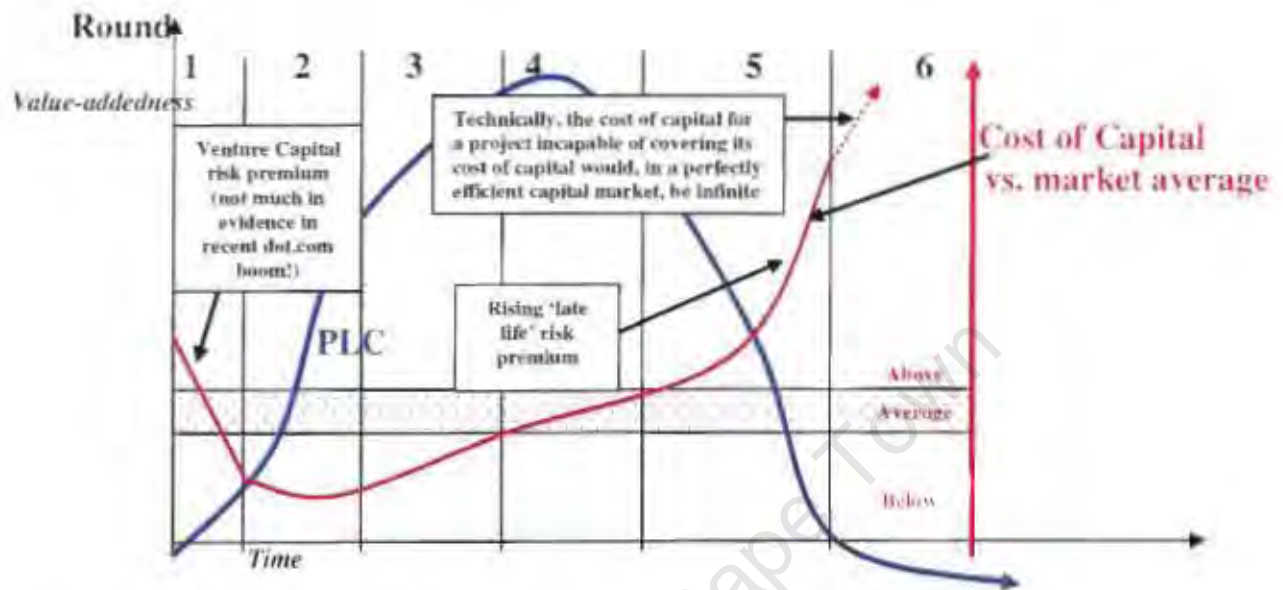
Round VI: The final round focuses on Cargill, the world's largest grain trader and yet a company unable to turn a dominant market position into true profit. High market concentration does not stop Cargill from being a 'living' example of a company that appears to be in danger of sinking even before it reaches the Avalon from where the siren sounds of perfect competition call. It is just as well that Cargill has always been a private company; were it public, the markets would probably have abandoned this Sinking Ship, as they have recently done Chiquita and Imperial Sugar. Cargill's cost of capital – were it to consider raising outside equity – would be higher than even Ford's given the underlying nature of its business.

From Red Hot to Ice Cold – Summary of how financiers would most likely view their role in terms of providing capital during a PLC.



¹⁷² Currently Ford is loss-making, meaning its PE Ratio is 'academic'

Superimposing a cost of capital line on a 'gross' PLC logically produces the following profile. (Chart shows PLC *before* deduction of cost of capital.)



The above chart is meant as a theoretical guideline only. Note how the average cost of capital is forecast to occur somewhere in Round III or IV. A 'rule of thumb' might suggest the market average would be close to that prevailing when a stock goes 'ex-growth'.

3 i) The Alpha and Omega of Pricing Power

Wicksteed maintained that, viewed through the prism of opportunity cost, *'supply is reverse demand'*¹⁵³. Within an equilibrium born of perfect competition and constant costs – the idealised world of the Marginalist – this is conceivably a maintainable proposition. In a related sense, *'pricing power is reverse purchasing power'*, but subject to the all-important absence of profit suggesting that for this equivalence to obtain, it must be viewed through the prism of the opportunity cost of capital. If the two are not equal, it is due to the residual influence of profit or the negative influence of loss. Only at the point of commoditization – where neither profit nor loss exists – can it be said that, in *relative* terms, *'pricing power is exactly equal to purchasing power'*.

This comment qualifies the absolute idea expressed in [Section 3f\)](#) that while the scarcity coefficient is positive, pricing power is always greater than purchasing power. In an abstract sense this is correct, but once the prism of opportunity cost intercedes, pricing power can fall below purchasing power when viewed relatively. If the capital underpinning that weak pricing power can produce value-adding pricing power by being employed elsewhere, where the corresponding purchasing power would be less powerful, it points towards the existence of a value-destructive world of negative pricing power.

Assuming this relativity, pricing power exceeds purchasing power within the same PLC whilst suppliers have the upper hand, when the product being sold is in sufficiently scarce supply for the supplying industry's cost structure to be low enough allow for value to be added. Purchasing power gradually assumes

greater weight as the consumer becomes more influential – when the consumer chooses between increasingly abundant supply options and when competition restricts the room for manoeuvre amongst the product's various suppliers – eventually overwhelming relative pricing power after commoditization.

The Alpha of Pricing Power: When the supplier is a 'Price Maker'

- Price changes are largely firm-controlled and can go up.
- Profit margins are healthy.
- Corporate room for manoeuvre is significant.
- Margins grow as output grows.
- Cost control is important, but not critical.
- Competition is concentrated.
- Substitutability limited allowing supplier to have a hold on consumers.
- Barriers to entry are high.
- Cyclicalities are not noticeable.
- Profits are available to finance R&D and 'regenerate' the product.

The Omega of Pricing Power: When the supplier is a 'Price Taker'

- Changes in price happens frequently, more often down than up.
- Profit margins are negligible to non-existent.
- Corporate room for manoeuvre is limited.
- Virtually no opportunity exists to raise margins, let alone prices.
- Achieving low cost production is of near paramount importance.

¹¹⁵ Wicksteed P. H., 1910

- Competition, having been largely fragmented during the middle of the PLC, may be consolidating again; that said, it is frequently 'toothless' in terms of its ability to generate profits.
- High degree of substitutability prevails.
- Barriers to entry are low.
- High degree of cyclicity exists.
- As profits are scarce, so is finance for R&D and product regeneration.

3 j) Sharpness Revisited and Marshall Reconciled

In the formula $P = Q \cdot \Delta MC \cdot E_S (1 + E_D)$, the relative 'sharpness' of Marshall's pair of scissors is largely captured in the α item, $(E_S(1 + E_D))$, noting in particular that the embedded ΔMC in E_S plays its part in the full determination of pricing power.

Assuming declining unit costs, when E_D is still less than -1 and when E_S is still even closer to zero than E_D , pricing power's 'sharpness' manifests itself in an ability to capture profits. But once E_D has crossed the -1 line on its way to negative infinity, an increasingly blunted market appetite blunts that supply 'edge'. In turn, the declining hold that a product previously had on the market's imagination will likely increase indiscipline amongst rival suppliers. Where E_D has gone beyond -1 , such indiscipline becomes progressively more corrosive, and – unless some sort of truce amongst late cycle behemoths can be engineered – the industry is destined for commoditization.

At this point it is useful to return to Marshall's scissors quotation.

We might as reasonably dispute whether it is the upper blade of a pair of scissors that cuts a piece of paper, as whether value is governed by utility or cost of production. It is true that when one blade is held still, the cutting is effected by the moving of another. We might say, with careless brevity that the cutting is done by the second; but the statement is not

*strictly accurate, and is to be excused only so long as it claims to be merely a popular and not strictly scientific account of what happens.*¹⁵⁴

Marshall's simile can now be shown to be technically correct. For the 'cutting' to occur, both the blades of purchasing power and pricing power have to be employed. More specifically, the relative sharpnesses of *both* blades plays a part in that cutting process at *all* times. Neither pricing power nor purchasing power are solely determined in supply or demand vacuums respectively: both need inputs from supply *and* demand to be properly measured.

Supplier pricing power faces the market's appetite at the 'top' end of its margin. At its 'bottom' end, it is determined by the bedrock of costs underlying the making of the good or service. Consumer purchasing power is, by contrast, limited by its ability to pay on the one hand and the nature of the supply market it faces on the other.

This is implied in the scissors quotation. Marshall talks about '*when one blade is held still*'. To elaborate this comment, one can imagine the sharpness of pricing power to the relative 'bluntness' (or 'inelasticity') of purchasing power as the dicing knife to the unyielding chopping board – the latter actually assists in the cutting process *by being 'blunt'!* To underline this point in traditional and obvious economic terms, **demand aids profit generation if it is inelastic.** There is nothing a monopolist would like more than an unyielding demand curve against which to supply a product – Nirvana would be to sell only one item for all the money in the world!

¹⁵⁴ Marshall A., 1890

The reverse can also be shown to work at the other end of the product lifecycle – purchasing power has been honed during the progression of the PLC so much so that it eventually cuts against a relatively blunted pricing power, the relative bluntness particularly brought about by edge-corroding competition amongst rival suppliers leading to the diminution of corporate pricing power and so the decline of value-added margins. Although this means that the upside of the supply curve moves towards near perfect elasticity as near chronic surplus capacity manifests itself in an industry, just occasionally the supply curve manifests itself as being kinked: over a limited price range, it is almost totally inelastic. This occurs when demand contracts but industry suppliers keep producing to meet capacity utilization targets. This is when the pricing power becomes the chopping board to purchasing power's dicing knife. The result? Prices fall precipitously until either suppliers come to their senses and reduce output (or go bankrupt – another way of reducing output!) and/or the demand that would be forthcoming at the lower price/quantity combination is satisfied in a way which the industry can also 'live with'.

If purchasing power is seen as being on the side of the consumer, and so on the side of Marshall's 'utility' while pricing power can be said to be on the side of the suppliers and so on the side of Marshall's 'costs', one can argue that there *are* times when suppliers 'govern' value – broadly during the first half of the PLC. So too there *are* times when consumers start to 'govern' value – broadly during the second half of the PLC.

Recall what Dietzel said about the origin of value: *'the value of scarcity goods is determined by utility, while the value of freely reproducible goods is*

determined by costs'.¹⁵⁵ View this comment through the medium of a PLC and (after adjusting for the absoluteness of Dietzel's division), there is a lot of truth in the observation.

In conclusion, just as one hand cannot clap alone, so Marshall is right to imply that one blade of a pair of scissors is not sufficient to cut a piece of paper on its own. In other words, there are no times in a product's life when the purchaser's utility *alone* or the supplier's costs *alone* govern the creation of value: both are always needed.

¹⁵⁵ Quoted by Böhm-Bawerk E., 1894-95

Section 4.

The Cost of Capital and Producer Pricing Power

This section further examines two concepts more often used in business circles but both of which are firmly grounded in economics. The nature of financial capital itself is re-examined in this context.

4 a) Cost of Capital I: Measuring Capital's Opportunity Cost¹⁵⁶

The financial cost of capital (equity, debt or a blend of both) is the hurdle rate financial markets expect a company employing capital to achieve for it not to destroy capital value. By implication, if a company cannot beat this opportunity cost, its capital could (and if one were to accept the paramount dictates of the reproductivity of capital, 'should') be employed elsewhere.

The cost of capital is time-dependent. Time, as it concerns an investment's feasibility, primarily focuses on the gestation period before payback. Generally, the longer the gestation period, the greater the risk that the investment will not be able to reproduce its initial capital stake. This means *'Present goods are, as a rule, worth more than future goods of like kind and number.'*¹⁵⁷

Reasons for this vary. For example, information bleed could alert potential competition to a profit opportunity and thereafter impact negatively upon the conditions of supply. Alternatively a potential customer could be lured away to

¹⁵⁶ This section draws heavily on an article by Mäkeläinen E. of the Helsinki School of Economics and Business Administration entitled *'Economic Value-added as a Management Tool'*; www.evatomics.com

¹⁵⁷ Böhm-Bawerk E., 1889

a competing product. Any doubts about the future that add to uncertainty would add to the cost of capital.

Marshall wrote that *“the element of time [is] the source of many of the greatest difficulties in economics.”*¹⁵⁸ Corporate finance, perhaps in recognition of this, has devised a ‘practical solution’ to these difficulties that is both straightforward and simple, perhaps brutally so. Borrowing from the workings of Fisher¹⁵⁹ and Keynes¹⁶⁰, corporate finance has appropriated the discount rate as the central solution to the issue of time.

Though this approach can be said to cut corners, it provides a ‘rule-of-thumb’ that is at least, after Keynes, *“... vaguely right, (rather) than precisely wrong”*¹⁶¹. It also provides a ‘ready reckoner’ by which to do cross comparisons between various projects competing for the attention of capital and thereby evaluates their differing opportunity costs.

On this issue, Keynes acknowledged the fact that different investment propositions have different interest rates – *‘a wheat-rate of interest, a copper-rate of interest, a house-rate of interest, even a steel-plant rate of interest’*¹⁶² – though he did not distinguish the cost of capital as a composite of the risk-free rate and an activity-based equity risk premium as will be followed below.

The ‘consilience’ used above superimposes the cost of capital line on the PLC, thereby determining where and when returns exceed or do not exceed the hurdle rate. **This synthesis highlights the critical observation of this thesis –**

¹⁵⁸ Marshall A., 1890

¹⁵⁹ Fisher L., 1930

¹⁶⁰ Keynes J.M., 1936, especially Book IV

¹⁶¹ Quoted by de Long B., on his webpage: <http://econ161.berkeley.edu/Economists/keynes.html>

the point of commoditization where the PLC falls below the unit cost of capital, that point where Keynes noted *'it is not profitable to produce'*.¹⁶³

When a particular industry is subjected to commoditization and can no longer cover its cost of capital, its firms may face 'fatal' consequences.

Because the distinction between *true* profit and covering cash costs can be wide, many companies live on in the corporate equivalent of limbo – not truly 'alive', not completely 'dead'.¹⁶⁴ Though they are not covering their imputed cost of capital, they *can be* covering their running expenses, what Brenner calls *'covering only the cost of their circulating capital'*.^{165, 166}

Generally the closer a product comes to being commoditized, the greater will be the capital risk associated with both investing anew or remaining invested in that project, usually because returns become more volatile. This volatility is reflected in a higher 'beta' (essentially a measure of the volatility of value creation against an average benchmark) being used in the determination of that company's specific cost of capital. Higher betas add to perceived risk, raising the required rate of return for the capital-utilizing company.

Where that venture is located in an emerging market (not unusual where both traditional and now more 'modern' commodities are concerned), there would

¹⁶³ Keynes J.M., 1936

¹⁶⁴ Keynes J.M., 1936

¹⁶⁵ In the US, 'Chapter 11' is arguably a form of corporate limbo, and redemption is possible from this status. Marx also used the concept of *'dead capital'* to refer to an industry that was no longer profitable. Herein the commodity is shown to be not so much dead capital but a dying product that still contains within it capital that could be otherwise usefully employed if it could be salvaged from that product.

¹⁶⁶ Brenner R., 1998

¹⁶⁶ In extremis this is done with the aid of borrowings: typically it is only when borrowings can no longer be serviced that bankruptcy occurs and the period of limbo ends.

likely be an additional geographic risk premium (often subsumed in 'political risk'), making the required hurdle rate even higher.

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4 b) Cost of Capital II: WACC – A Modern Definition¹⁶⁷

In 1960, Sraffa noted, *'The rate of profit is susceptible to being determined by the levels of the money rate of interest.'*¹⁶⁸ Modern corporate finance theory has fleshed out this statement so that, in today's business world, the most widely used definition of true profit incorporates the 'weighted average cost of capital' (WACC) concept. At the core of this concept is the level of the risk-free interest rate offered on money. WACC is a company-specific measure that blends the cost of equity with that of debt so as to derive a hurdle rate above which any earnings achieved would be true profit.

The specific definition used by Stern Stewart, the management consultants who popularised the related Economic Value Added¹⁶⁹ (EVA¹⁷⁰) concept, is as follows:

$$\text{WACC} = \text{cost of debt} \times \text{level of gearing} + \\ \text{cost of equity} \times (1 - \text{level of gearing})$$

$$\text{where cost of debt} = (\text{risk-free rate} + \text{lending margin}) \times (1 - \text{the tax rate})$$

¹⁶⁷ This section relies heavily on the website of Stern Stewart, www.sternstewart.com and Copeland T., Koller T. and Murrin J., 2000. In addition, it draws upon various articles in *The Journal of Applied Corporate Finance*, published by Stern Stewart; in particular from 1999 vol 12 num 1 spring: Schramm R. M. and Wang H. N.; O'Brien T. J.; Pettit J. and Ferguson M. and Gluck R.

¹⁶⁸ Sraffa P., 1960

¹⁶⁹ The EVA term is the registered trademark of Stern Stewart.

¹⁷⁰ The EVA approach will be used extensively in this thesis though specifically the variant used is the adjusted EVA (AEVA) concept, which uses market value of assets to calculate the capital charge, not the arbitrarily depreciated asset schedule. **It is not claimed here that it is the only method that can or is used to analyse whether projects are value creative or destructive.** EVA has its critics and it has its rivals of which CFROI (cashflow return on investment) some claim to be more robust. However EVA and its variants are probably the most widely used and universally accepted capital efficiency evaluation methodologies today. The main source for this section is <http://www.economics.com/evastudy/evastudy.shtml>

and cost of equity = (risk-free rate + (beta x equity risk premium)).

The risk-free rate is usually taken as the yield on a long-dated government bond – for example, the US 30 year Treasury bill.

The beta is the volatility of a particular stock against a benchmark index – for example, the S&P 500 index.

The equity risk premium is the extra reward needed by an investor to lure them away from the risk-free option (usually taken to be the 30-year US Treasury Bond) into the normally riskier option of equities.

The WACC can either be deducted from aggregate earnings as a charge representing the opportunity cost of the total capital still employed or (as used here) as a per unit capital charge from the gross profit margin. Gross profit is derived from the net operating profit after tax (NOPAT), a measure which includes all standard cost deductions *including* tax but *excluding* interest paid on borrowed money, the latter being covered in the WACC deduction.

The History of EVA

EVA is not a new concept. Marshall first mentioned the '*residual income*' principle underlying it in 1890¹⁷¹ when he defined economic profit as total net gains less the interest on invested capital at the current rate. EVA is such a '*residual income variable*'.

This idea appeared in accounting theory literature in 1917 (Church) and in 1924 (Scovell)¹⁷². It reappeared in management accounting literature in the 1960s, where it was used mainly as a performance measure.¹⁷³ EVA as trademarked by Stern Stewart is one variant of the residual income concept, with specific definitions on calculating income and the cost of capital¹⁷⁴.

The economist's definition of profit is EVA-compatible though the specific term 'cost of capital' is mentioned infrequently in standard textbooks. Lipsey and Chrystal are notable exceptions, specifically defining profit as being '*the excess of revenue over all opportunity costs including those of capital as Economic Profit (EP) rather than EVA to avoid problems caused by trademarking*'.¹⁷⁵ They add – pointedly – that '*Economists count the opportunity cost of capital as a cost; accountants treat it as part of profits.*'

Notwithstanding Lipsey and Crystal's claims, there is a widespread lack of understanding on how to define true profit in mainstream economics, especially amongst economists focussing on macro issues. As shown below, the imputation of a non-cash deduction required in determining true profit is at the root of much confusion. Politicians, corporate managements and even some accountants share in this confusion as to the true definition of 'profit'. The net result is often profits are assumed to exist when, properly calculated, losses are being made. Arguably, it is the growing insistence of management consultants like Stern Stewart and zealous converts in the fund management industry that the cost of capital must be deducted from 'accounting profits'

¹⁷¹ Dodd J., Shimin C., 1996.

¹⁷² Dodd J., Shimin C., 1996.

¹⁷³ Dodd J., Shimin C., 1996.

¹⁷⁴ Stern Stewart company website. www.sternstewart.com

¹⁷⁵ Lipsey R. and Chrystal K.A., 1995.

that is waking up all parties to the idea that 'true' profits are much harder to earn than had previously been thought.

The biggest weakness to the EVA approach is that it cannot always adjust the value of the capital base to reflect accurately its true market value at any one point in time. Instead it tends to use the depreciated asset base as determined by the auditors as the monetary amount against which to impute the cost of capital charge. Technically, this is not a bad measure as it is traditionally conservative, though depreciation schedules are frequently driven more by tax considerations than the desire to reflect asset values accurately. Consequently this method does not always work well if asset value depreciation has the net effect of *underreflecting* the true monetary value (in break-up salvage value terms) of the asset base, not uncommon for mature businesses¹⁷⁶. Furthermore, this estimate is less accurate in inflationary environments, which again can mean the imputed capital charge is understated, thereby overstating true profit.

In both cases, since the capital charge is understated, the imputed deduction from declared income to arrive at EVA flatters to deceive, perhaps implying value creation where there was value destruction. Either way, if EVA *is* negative, the company *is* destroying value.

EVA: simply a measure of capital productivity

The most commonly used version of 'productivity' in economics measures changes in labour efficiency as it relates to (for example) physical output, time worked or overall GDP. (This succeeded Ricardo's bias, which focussed on the

¹⁷⁶ One former Falconbridge Nickel executive I know calls 'profit' earned from a fully depreciated asset (in Falconbridge's case, it was a nickel refinery in Norway), *the big lie*.

marginal productivity of land.) EVA can be seen as a way of substituting financial capital for labour in the productivity measurement process. In money terms, it calculates the input/output ratio of goods and services required to create a product, the difference being a financial measure of the capital value created or destroyed in that process.

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4 c) Cost of Capital III: Modigliani-Miller – Spentre at the Corporate Finance Feast?¹⁷⁷

Return on equity (ROE) is arguably the measure about which investors of equity capital in a firm (which can include management) tend to be most concerned. This is because ROE is normally the 'cleanest' measure defining how efficiently an investor's equity capital is being used.

Notwithstanding the findings of the Modigliani-Miller Theory (MMT; addressed below), the related belief is that if a given management can achieve the best possible ROE at a given time in its firm's lifecycle, it gives the company a better chance of being highly valued by the stockmarket.

ROE is a measure derived from the return on capital employed (ROCE), the overall returns generated by a firm's combined equity and debt. The ratio of debt to equity or 'gearing' defines what share of these returns accrue first to the lenders of debt capital in the form of interest and what remains (before paying taxes)¹⁷⁸ for the owners of equity capital.

Generally speaking, over the lifecycle of the firm, the wider ROCE measure initially improves but eventually tends to give way, notwithstanding the best efforts of management. That said, a clever management would gradually raise gearing later in the firm's lifecycle (usually aided by growing free cashflow capable of servicing such increased debt) so as to ensure the narrower ROE measure remained strong even when overall ROCE started to decline. This is

¹⁷⁷ This Section relies heavily upon Brigham E. and Weston F., 1999 and *The Economist, Survey of Corporate Finance*, 27.01.2001

because lenders do not require capital growth, merely debt to be serviced; raising gearing can concentrate whatever capital gain still remains to be extracted from the firm's lifecycle on a smaller capital base.

Even such financial engineering is unlikely to prevent the gravitational forces of aging from slowly reducing the company's market value. Rather it would indicate to the stockmarket that the balance sheet *'still goes to the gym three times a week'*¹⁷⁹ thereby deserving as good a rating as possible. In practice, only towards the end of the lifecycle of a well-managed, single product company need ROE start to suffer as lenders sense a growing risk of default and either raise their interest rates¹⁸⁰ or refuse further advances, preventing higher gearing and thereafter squeezing ROE as ROCE continues declining.

(The definition applied to 'free cashflow' is one used by Jensen: *'Free cashflow is cashflow in excess of that required to fund all projects that have positive net present values when discounted by the relevant cost of capital'*.¹⁸¹)

Microsoft and Ford, companies at very different stages of their respective lifecycles¹⁸² both had returns on equity of 21% during 2000. But Ford only achieved this by having gearing of 38.4% whereas Microsoft was not only ungeared but had a net \$27 billion in cash.¹⁸³

¹⁷⁹ Both the before and after tax ROEs are easily calculable.

¹⁷⁹ A quote I heard while working in the Corporate Finance department in Rothschild's in London.

¹⁸⁰ In October 2000, after six profit warnings, Xerox saw its borrowing spread over LIBOR rise almost 200 basis points to 450 basis points in one day as the market finally lost patience with the company and repriced its bonds as 'junk'. (*The Economist*, 27.01.2001.)

¹⁸¹ Jensen M. C., 1986

¹⁸² See [Section 5](#): Stage 2/Splendid Isolation and Stage 5/Slippery Slope respectively

¹⁸³ *Merrill Lynch Analysis* Reports, both dated 19.1.2001

During a successful firm's lifecycle, the blend of equity and debt will tend to change, often falling from being geared soon after its foundation only to rise again to be heavily geared later in its life.

The various phases approximately follow the following route:

Start-up: A new company, say one owned by two partners, will usually try to run on as little founding risk capital as the original investors can get away with, often simply their own contribution and so not 'shared' with other investors. Beyond this, the venture would usually try to grow on loans, thus 'hoarding' the equity capital for the founders and ensuring that they benefit from 100% of any appreciation of value (*'capital gain'*) arising. (Frequently founders fund start-ups with 'token' equity supplemented by shareholder loans.)

If the company turns profitable during this stage, ROCE will start to rise, but ROE may lag if most of the ROCE is due as interest to lenders. Where the founders sense longer-term value of the company to be rising, the likelihood of the promise of future capital gain will usually be compensation enough.

Sharing the equity capital with outsiders. At some point – and growing companies nearly always face tight cashflows and so a sizeable and growing 'working capital overdraft' with their bankers – further equity injections may become necessary. Often this occurs at the behest of increasingly nervous bankers; *'We think you are a great company with an excellent future but we would be happier if you reduced your gearing by getting new risk equity'* is their usual comment. Assuming other forms of debt capital are exhausted, the owners must either risk more of their own capital or approach outside providers of venture/mezzanine capital. (Owners can use the stockmarket to raise capital,

but usually this does not happen until later as IPOs often involve founders cashing up some of their original stake, before perhaps raising new equity.)

As gearing starts to decline, the debt/equity mix changes. Normally, operating profit is not affected by such changes, though the split of earnings between owners of risk capital and lenders of debt capital will. A successful company will see ROE rise, often overriding dilution arising from the capital base being shared amongst a wider group of investors.

Less successful companies (invariably the majority in numbers terms) will have different experiences. For the sake of completeness, we follow the fortunes of a company that succeeds in getting through this stage, whose earnings start to rise, whose ROCE continues to improve, whose gearing starts to fall and so, by extension, whose ROE increases.

Issuing equity on the Stockmarket. An IPO probably follows at some point to allow existing investors to realize some of their capital gain and/or to raise further equity capital. Thereafter, a company is not so dependent on lenders for working capital and playing off bankers against additional equity investors becomes a serious option. In a good company both ROCE and ROE will continue to rise, the latter at a faster rate than the former if gearing is falling.

The ideal of not having to share ROCE with lenders. If a company achieves both strong profits and positive cashflow – in 2000 Microsoft found itself with profits of \$11bn and annualised cashflow of \$11.6bn¹⁸⁴ – *on the face of it* there is no need for outside lenders: the owners of risk capital can take all the extra ROCE earned for themselves as ROE.

The qualification hinted at here – *on the face of it* – is covered below. Essentially the situation can and usually does arise whereby clever gearing – such as borrowing to buy back shares, thereby shrinking the capital base – can improve ROE even further, though this practice may not change anything material at the operating profit level.¹⁸⁵ Share buybacks funded out of debt are a form of debt creation without the retention of the proceeds. This, Jensen notes, allows management to ‘*bond their promise to pay out future cashflows*’. Thus ‘*debt can be an effective substitute for dividends*’, and good managements can concentrate whatever capital gain remains to be made over a smaller equity base, preventing ROE erosion, perhaps even enhancing it.¹⁸⁶

Notwithstanding such tactics, the peak of a company’s ROCE is usually reached during this stage. Thereafter, management’s challenge is to run a tight balance sheet matching business demands (in particular not undermining future prospects through short-changing R&D) with shareholder demands, the latter centring mainly on the desire to see a high ROE.

When ROCE starts to slip. As a general observation, given the shortening lifecycle of most products today, ROCE starts to slip sooner than previously. But ROE need not immediately follow it. Because debt is cheaper than equity (interest is a pre-tax expense), the blending process – that judicious mixing of debt with equity – tends to begin in earnest when ROCE starts to decline.¹⁸⁷ Debt starts to replace equity. This change makes cashflow even more important.

¹⁸⁴ *Merrill Lynch* Analyst Report, 19.1.2001

¹⁸⁵ Again, even Microsoft follows this practice, having repurchased 22.8 million shares for \$1.5bn during Q4 of 2000, essentially using more than half its free cashflow during the period to do so *Merrill Lynch Analyst Report*, 19.1.2001.

¹⁸⁶ Jensen M. C., 1986, emphasis added

¹⁸⁷ Well-managed companies will already be geared to some degree even before this point.

as the blend between equity capital whose cost 'need only' be imputed and capital whose cost *must* be serviced shifts towards the latter.

This is fortuitous as Mueller, in his exposition of the firm's lifecycle¹⁸⁸, notes: '*the maturer the firm, the greater the likelihood of internally generated free cashflow*'. He suggests that the move away from equity funding to internally generated free cashflow (which can then be used to finance higher levels of gearing) moves the company away from the greater discipline of equity markets to the relative freedom of being self-sufficient in cashflow terms (or even to the lesser discipline of the debt markets who 'merely' need their debt to be serviced and so almost never focus on ROE *per se*). This switch tempts managements to '*relax*' in their campaign to use capital productively.

Furthermore not only does Mueller suggest '*internally generated free cashflow is used less wisely*' but that '*large sluggish firms invest too much in growth (where)...they should not be growing at all.*' This implies that the marginal productivity of that extra unit of capital has declined to the extent that, *if used efficiently*, it should thereafter be applied to a younger, smaller firm. The latter – having exhausted their own start-up capital and the limited bank facilities available to companies without free cashflow – have little option *but* to resort to equity markets to raise further capital, and by doing so accept their greater discipline.

Thus the cycle of reaping and sowing capital evolves – though not without the occasional 'lapse of discipline' as with the dot.com mania of 1999-2000 where young companies could obtain equity financing so easily that one observer was

¹⁸⁸ Mueller D., 1972; Grabowski H. G. and Mueller D., 1975

moved to enthuse that '*capital has become a commodity instead of a scarce resource*'¹⁸⁹. Subsequent events showed this 'lapse' not to be permanent.

Owners of capital seem to sense growing capital 'wastage' by more mature firms. A study by Baumol and others¹⁹⁰ shows the marginal return for a mature firm is often substantially below the market discount rate thereby prompting a rising preference for earnings to be paid out in dividends rather than retained. This campaign by investors to '*give us back our money*' is shown below to tie in with the growing nervousness of owners of capital when they perceive that their capital might be 'trapped' in a company heading for commoditization.

'Blending' of debt with equity is pursued more aggressively than it used to be, most likely because of the juxtaposition of shares buy-backs, the ready availability of corporate debt to fund such buy-backs and the motivation of managements invigorated by the prospect of their own share option schemes becoming more valuable as share prices rise.¹⁹¹

Reflecting this, corporate debt levels in the US have been rising – average gearing (measured against book value) has risen 13% to 83% over the past

¹⁸⁹ Strassmann P. A., 9.8.1999, *The Search for Productivity*. *Computerworld*: the word 'commodity' is not used in the tighter context that is normally employed herein.

¹⁹⁰ Baumol W.J., Hain P., Malkeil B.G., Quant R. E., 1970

¹⁹¹ This confluence of interests would be something of a virtuous circle was it not for the continued non-treatment of share options as a corporate expense under US GAAP, even though such schemes are treated as income in the hands of the recipients by the tax authorities. Warren Buffett has famously asked: "*If stock options aren't a form of compensation, what are they? If compensation is not an expense, what is it? And if expenses shouldn't go into the calculation of earnings, where in the world do they go?*" Cited in *the Economist*, 27.1.2001: Microsoft has been a major user of this charitable interpretation. In the same *Economist* article, a study done by *Smithers & Co* is cited: "*Had Microsoft accounted for its options properly, in 1998 it would have not made a profit of \$4.5 billion, as its accounts showed, but a loss of \$17.8 billion.*"

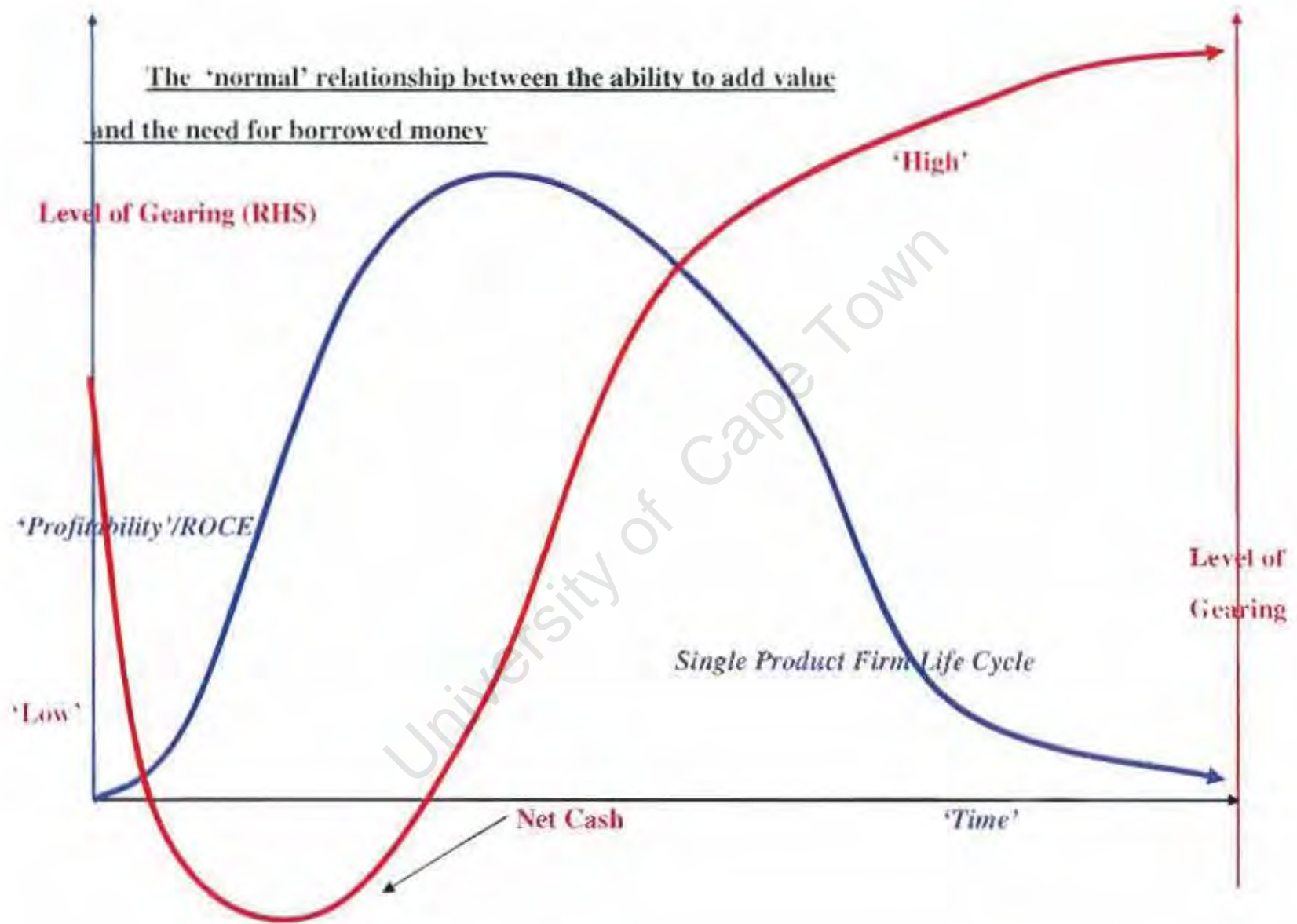
three years¹⁹², even though this was a period of rising profits and robust cashflows. But, there has to be a limit:

*Clearly, piling up more debt benefits shareholders only up to a point. That point, roughly speaking, is reached when bondholders are so worried about the company defaulting that the cost of its debt rises to unsustainable levels. To go on borrowing beyond that point may even lead to bankruptcy – though note that bankruptcy in America is rather less onerous to shareholders than it is in many other big economies. Moreover, inflation, both in America and elsewhere, is much less of a problem than it was in the 1970s and early 1980s, so interest rates are lower and companies can afford to borrow more. Some commentators, notably Stern Stewart, a consultancy that does a lot of work in this area, maintain that many firms still have too little debt. Mature, profitable firms, with the least need to borrow, probably benefit most from doing so. Bond markets are a harsh taskmaster: that interest has to be paid.*¹⁹³

What emerges is that ROCE, ROE, cashflows and judicious levels of gearing tend to vary according to where a firm is in its lifecycle. The diagram on the next page tries to summarise the “normal” experience of a firm that would live a full and productive life, before addressing the claim that holds that the above is *irrelevant* insofar as it affects market value – the Modigliani-Miller Theory.

¹⁹² *The Economist*, 27.1.2001

¹⁹³ *The Economist*, 27.1.2001



Notes to the above diagram

1. There are always exceptions to this generalization but the portrayal above would be familiar to corporate financiers analysing funding requirements of a successful and reasonably long-lived company.
2. Value-addedness over the lifecycle would correlate highly with ROCE.
3. The timing of switching out of being borrowed to relatively ungeared during the early stages of a company's lifecycle would be very dependent upon free cashflow – which typically lags profit growth in an emerging company.
4. Companies can have 'negative gearing' – as with Microsoft's \$27bn net cash position at present. At the other end of the spectrum, gearing can rise over 100%. This is standard in the paper and pulp sector because this is the only way to make a highly cyclical, near commoditized business achieve a positive return on equity. However, limits to gearing were illustrated by Daewoo of Korea – gearing rose over 600% before its bankers called it to account, though not soon enough to prevent its bankruptcy.
5. The tax environment is critical to determining the debt-to-equity blend as interest on borrowings is a tax-deductible expense, as the *revised version* of the MMT admits and accommodates (see below).
6. Share option schemes – were they treated as an expense – could still be comfortably accommodated in the above diagram. The fact that they are not (and that the market has largely ignored this fact thereby overstating 'value-addedness' in earnings per share measures¹⁹⁴) makes the typical measurement of both value-added *and* potentially gearing overstated (assuming outstanding options are 'in the money').

¹⁹⁴ This oversight by the market does not sit well with the Efficient Markets Hypothesis (EMH), which some might regard as an outgrowth of the Modigliani-Miller Theory; one suspects Franco Modigliani in particular would be uncomfortable with this.

7. Another anomaly in US accounting rules – the treatment of goodwill arising upon acquisition (the ‘pooling of interests’) has until recently¹⁹⁵ caused the above diagram problems. The true definition of capital employed can become obscured in such circumstances, meaning that the size of the capital base was understated and so the return to that base overstated.¹⁹⁶

The Modigliani-Miller Theory (MMT)

In 1958, Modigliani and Miller collaborated on a paper entitled ‘*The Cost of Capital, Corporation Finance and the Theory of Investment*’¹⁹⁷ establishing a tradition that was to win them Nobel Prizes for Economics¹⁹⁸.

The essence of MMT is that, given certain assumptions, the market sees through all attempts at financial engineering; efforts to manage the capital base of a company judiciously do not change the fundamental value of the firm.

*The market value of a company is independent of the way it chooses to finance its investment or distribute dividends.*¹⁹⁹

The argument extends the line of thinking begun by Ricardo – and captured in the concept of Ricardian equivalence – that the only decisions that matter are those that deal with real variables. MMT does *not* say that the split between returns to suppliers of capital cannot be varied but rather that the *overall* value of the firm will not change even if that split does.

¹⁹⁵ US law is being altered to exclude this practice.

¹⁹⁶ Again, this misperception causes a problem with the Efficient Markets Hypothesis.

¹⁹⁷ Modigliani F. Miller M, 1958

¹⁹⁸ Modigliani in 1985: Miller in 1990.

¹⁹⁹ 1998 *Dictionary of Economics*, edited by Bannock G., Baxter R.E. and Davis E.

Modigliani had already extended the logic of Friedman²⁰⁰ to include a Lifecycle Theory of Consumption²⁰¹. Together, they addressed the demand-side consumer's saving, investment and consumption patterns. MMT essentially did the same for the supply side of the equation insofar as it dealt with the way that the market allocates capital to a firm over its life.

The implication of MMT is that investors determine a firm's value by discounting its forecasted revenue streams by the risk attached to those streams – the dividend discount model that is at the heart of financial economics. The bottom line is that, in valuing a company, the market is neutral to the way a firm finances its capital base and pays out its profits.

There is no doubt that markets can see through certain tactics employed by corporate financiers. For instance, buying back shares to maintain a high ROE does not automatically maintain a high valuation. Though Ford and Microsoft both achieved an ROE of 21% in 2000, and Ford's profits were more than 50% those of Microsoft, Ford's \$54bn market capitalisation was only 16% of Microsoft's \$330bn²⁰². Consequently Microsoft's historic price/earnings ratio of 32 times was almost 4 times Ford's 8.5 times. This difference is a relative reflection on the market's take of the future earnings prospects of both companies. This is neither inconsistent with MMT nor with saying that Ford is later in its corporate lifecycle than Microsoft.

It is not intended to do a detailed critique of MMT here other than to comment on the way that it impacts on the cost of capital issue that is so critical to determining the point of commoditization in the approach adopted herein.

²⁰⁰ In formulating his Permanent Income Hypothesis; Friedman M., 1957

²⁰¹ Modigliani F, 1986

²⁰² Yahoo Finance, 5.2.2001

MMT's smooth operation depends upon a number of pre-conditions²⁰³:

1. No taxes.
2. No costs of financial distress.
3. No transaction costs when firms issue securities.
4. Investors and the firm have equal access to the market and can trade in it at the same price.
5. Investors and the firm have the same information about a firm's prospects.

The above does not always, or even typically, prevail in the real world. Today's debate centres on to the degree to which the qualification of these pre-conditions undermines the essential conclusion of MMT²⁰⁴. The answer that the financial markets believe to be the case (and corporate financiers are not disinterested in this debate's resolution!) is that the impurities in the system are sufficiently great that one cannot be held to the idea that remixing a firm's capital structure between debt and equity has no effect on the firm's value.²⁰⁵

Even the modifications to MMT (for instance, those accommodating tax and depreciable assets) are not sufficient to meet all objections, with the result that the WACC-style approaches are in practice the central suppositions concerning the cost of capital in modern corporate finance theory.

But this does not address the idea of how valuable a firm 'should' be. Perhaps the strongest claim that can be made is that the market *believes*, rightly or (as

²⁰³ Sercu P. and Uppal R., 1995

²⁰⁴ Brickley J.A. and McConnell J.J. in their 1998 *Palgrave* entry on 'Dividend Policy'

²⁰⁵ This debate is extensive and the case for MMT 'not yet proven'. The purist extension – the Efficient Markets Hypothesis – is particularly questioned. Summers L. and Schlefer A., Spring 1996, noted that: *The stock in the EMH – at least as it has traditionally been formulated – crashed, along with the market, on October 19th, 1987.* See also Schiller R., 2000, especially Chapter 9.

MMT would have it) wrongly, that given two companies with similar ROCEs roughly at the same stages of their corporate lives, the one that runs the tightest balance sheet – which ‘*goes to the gym three times a week*’ – deserves the best rating and so the higher value. This is logical as it is distinctly likely that such a corporation will live longer and so have more earnings to discount.

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4 d) The Cost of Capital – the Bedrock Coasean Transaction Cost?

After Coase²⁰⁶, the cost of capital can also be seen as but another transaction cost faced by the firm – indeed in a sense it can be viewed as the underlying monetary *numéraire* of *all* transaction costs since all a producing firm's inputs can be seen as capital bought and, when in final product form, capital sold.

Unlike transaction costs that involve the direct expenditure of cash, the cost of *equity* capital must be imputed. This represents a sort of unwritten contract between the suppliers of equity capital and its users, and one whose price – the cost of equity capital – is (at least legally) unspecified, though it can be derived from applying the dividend discount model to the share price.

Equity capital markets mediate the individual discount rate of an entrepreneur with the multiple discount rates of potential suppliers of financial capital to arrive at an imputed cost of equity capital. Together with this imputed cost, the entrepreneur (using the tax shield of deductibility on loans) must balance the *actual* cost of loan capital (the after-tax interest cost, noting that the pre-tax amount is a *cash* item) to create a combined weighted average cost of capital still would still allow that entrepreneur to add value.

Note also that the rationale for Williamson's *'make or buy'* decision becomes clearer²⁰⁷. In performing a particular function, unless a firm can add value by covering the cost of capital specifically employed in that function, it will benefit by outsourcing that activity. Such behaviour would then underline Coase's central contention that a firm is an institution that aims to minimize

²⁰⁶ Coase R., 1937

transaction costs. The dictates of financial economics would argue that the firm 'should' pursue this objective in its effort to maximize its capital productivity.

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²⁰⁷ Williamson O. E., 1985

4 e) Producer Pricing Power I: Rebalancing it with Consumer Purchasing Power

Producer pricing power is a concept more used in the business world. Even though the phrase is uncommon in economic literature, it is hardly as if economists have never focused on this idea. The '*economics of mark-up*', be it of marginal or average cost, deals with issues that are familiar to a businessman trying to determine his pricing power.

Though Piero Sraffa never mentioned the phrase 'pricing power', he arguably thought of little else, as epitomized in his reservations about the demand curve bias – the *purchasing power bias* – of the Marginalist Revolution.

This bias in the economics profession *is* changing but, if the language still used is any indication²⁰⁸, only slowly.²⁰⁹ Amongst some of today's central bankers schooled mainly in macroeconomic thinking, there frequently appears to be little understanding of what drives investment decisions that create supply, such as the need for an investment to produce products with sufficient pricing power to cover their associated cost of capital. Perhaps Keynes explains why:

We leave saving to the private investor... We leave the responsibility for setting production in motion to the businessman.... [T]hese

²⁰⁸ It is telling that no standard economic's textbook reviewed used the term 'pricing power'. And, to be fair, rarely would a piece of corporate investment research use the phrase 'purchasing power' though many would frequently refer to 'pricing power'.

²⁰⁹ Despite their name, it is *not* the so-called 'supply-siders' that are foremost in restoring this balance; their agenda is wholly different. Rather it is the 'business economists' and analysts in the investment community that are leading this campaign.

*arrangements, being in accord with human nature, have great advantages.*²¹⁰

'We' in this sentence presumably means '*macroeconomists advising a government*' and broadly speaking, Keynes's comment is probably still good advice.²¹¹ But '*not interfering*' need not mean '*not understanding*'.²¹²

Perhaps not unsurprisingly, it is economists in the private sector who seem to have developed a keener understanding of the nature of supply and who have often more accurately predicted the changes now evident on the supply side of the global economy. Ironically their understanding of corporate pricing power has risen even as the strength of that pricing power seems to have declined.

Take the foresight of David Roche who edited a publication entitled: '*Pricing Power to the People: the Shape of Economic Growth in the Nineties*'.²¹³ The introduction – entitled '*What PPP means for investors*' – involved a none-too-deliberate hijacking of an acronym well known to economists; Roche meant instead '**Pricing Power to the People**'.²¹⁴

His emphasis was deliberate; as Roche put it, '*our acronym stands for a slow, productivity-led*²¹⁵ *recovery in a low inflation environment ...which is marked*

²¹⁰ Keynes, J.M., 1923

²¹¹ It could be argued (though it will *not* be done here largely for those reasons cited by Keynes as '*being in accordance with human nature*'), that given the level of overcapacity that exists in many product lines today, the world today needs *supply management* much more than demand management – the global steel industry is a case in point.

²¹² In my experience as an Emerging Market fund manager used to interacting with macroeconomists working in governments and central banks, their lack of understanding how businessmen set production in motion verged on the chronic. The sole exception was Jacob Frenkel, then Governor of the Bank of Israel.

²¹³ Morgan Stanley, October, 1992

²¹⁴ Roche uses the term '**Pricing Power**' as something also possessed by the consumer. The implication is that up until the start of the 1990s, it was something that was often found to be in the possession of the producer. The 1990s were to be a decade when the consumer 'stole the producers' thunder'.

²¹⁵ Roche uses the term '*productivity*' here in its more traditional 'labour' sense

by a shift in pricing power from the supply side of the economy to the demand side'. Among the pertinent observations were:

- *The supply side of PPP is dominated by three key macroeconomic trends... a relocation of production to those regions of the world with successful emerging markets and where labour is plentiful and cheaper... the shakeout in the service sector globally...(and) intensive application of technology and innovative systems to get more out of existing inputs of labour and machinery.*
- *Company strategies will be aimed at gaining market share in slow-growing markets. This means that price-driven margin improvements are out and improved productivity²¹⁶ and competitiveness are in.*
- *At the heart of the 'Pricing Power to the People' concept is the massive transfer of pricing power from the supply side to the demand side of the global economy, with a concomitant change for the better in the productive use of capital.*

His forecasts have proved to be very accurate as will be illustrated below.

4.1) Producer Pricing Power II: Born of exploiting a Control Point

Everyone lives by selling something.

Robert Louis Stevenson²¹⁷

This quotation contains a kernel of truth that is often underestimated, especially by governments faced with the human fallout – unemployment – of the uncomfortable corollary statement: *If you cannot sell something, you cannot 'live'*. But just as it might be argued that the neo-classical tradition is too demand-sided in its approach, the same charge could be levelled at Robert Louis Stevenson – and many *'supplisiders'*²¹⁸. No seller can succeed without a buyer; supplier pricing power cannot exist in a demand vacuum.

Recognising the ultimate futility of this 'chicken-vs.-egg' debate, can one nevertheless pinpoint what it is that fathers pricing power? The two-fold answer is at one end, control points, and at the other end, costs.

Demand control points are those nexuses that aggregate the various discount rates of consumers, of *purchasing power*, into a 'market' that can be exploited by suppliers. More than anything else, such control points allow suppliers to regulate the relative scarcity faced by consumers.

²¹⁶ Again, Roche uses the term *'productivity'* here in its more traditional sense, but goes on to note *"a concomitant change for the better in the productive use of capital"*; emphasis added.

²¹⁷ Stevenson, R. L., 1892.

²¹⁸ The term is a controversial one. There is a small school of economists – mostly found working in financial markets – who are 'supply siders'. But they **ARE NOT** 'supplisiders' in the US sense, which generally refers to a group of commentators whose political ideology is masqueraded as mainstream economics. Their school largely depends on tax cuts for the rich and 'trickle down' theory.

Similarly supply control points aggregate the various discount rates of input suppliers into creating a unit hurdle rate that must be covered for a profit to be made. Costs are a measure of the scarcity of a supplier's inputs.

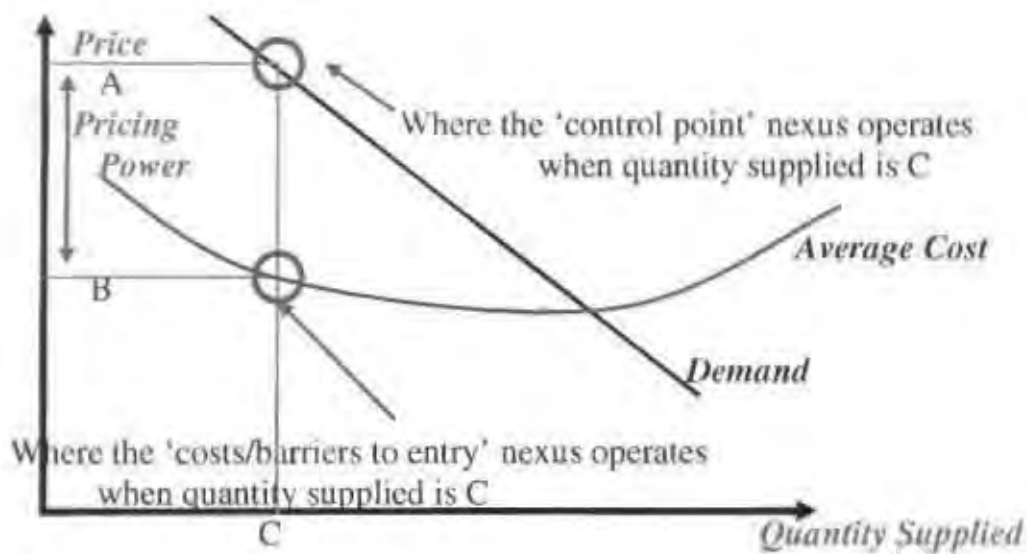
Profit then can be seen as a successful arbitrage between two different levels of scarcity – when expressed in monetary terms, that the scarcity of inputs is less than the scarcity of the resultant output.

A supplier's inputs could be aggregated and expressed in terms of a common denominator, a *gross* unit 'cost of capital'. This version of cost of capital is, as a hurdle rate, the monetary definition of the barrier to entry. Generally speaking, especially in the early stages of a PLC, the lower the gross unit cost a supplier can achieve, the higher the barrier to entry that supplier builds.

As noted above, a supplier will earn a profit if he succeeds in arbitraging between the average consumer discount rate as expressed in a price and his own hurdle rate, an aggregation of the discount rates of all his suppliers expressed as a unit cost of capital. Any positive difference between the two is profit, the essence of pricing power.

The art of pricing power is to juggle two these representations of scarcity – consumers' versus suppliers' – to one's own advantage. *The catch, as this thesis will show, is that the supplier's definition of scarcity – born of the need to employ capital reproductively – is more restrictive than the demand-biased one traditionally used in economics.*

The above comments can be easily represented in a format familiar to economists:



Pricing power is of course the margin between A and B.

'Ownership' of a control point allows a supplier to keep prices higher than they would otherwise be if subject to competition. A good example would be the control exercised by British Airways at Heathrow Airport on landing rights for transatlantic routes, a vice-like grip that allows it to charge higher ticket prices than would be available if this stranglehold did not exist²¹⁹.

Writing on the subject of control points, Thomas Stewart noted²²⁰:

Here's how to make money. Wrap your fingers around a jugular and then ask every passing corpuscle to pay a toll. Free markets, through the law of diminishing returns, destroy profits; the businessperson's job is to elude the law by setting up in a market place that is valuable and can be made less free. Control points – seizable, squeezable veins where money flows – change over time. A once priceless franchise becomes just another business, less valuable or no longer controllable.

²¹⁹ Notwithstanding this 'advantage', British Airways is still destroying value...

²²⁰ *Fortune*, 8.11.1999.

Where control points are legally enforced or based on contract, they tend to be more durable. Consider the contractual relationship between Coke and McDonald's: a customer buying a cola with a Big Mac must buy a Coca-Cola.

There are various types of 'qualitative' (i.e. not *obviously* price-based) control points that nevertheless have pricing power implications. They include:

❖ Being 'Number One' at making a product that possesses a defining characteristic – Gillette's Mach 3 razorblade is regarded as giving the smoothest shave. Providing that the market remains convinced that this blade is '*The Best a Man can get*', Gillette will have a grip, *based on perceived utility*, on the premium end of the product range.

❖ Other control points based upon market perception of excellence include:

The market knows me for...

...best in-flight service Singapore Airlines

...longest lasting batteries Duracell

...safest cars Volvo (in Europe)

❖ Some products have a paramount characteristic that defines their effectiveness. A nappy may look pretty, but dryness matters above all else! Occasionally the defining characteristic becomes something that every producer can offer – for instance, a watch that tells accurate time. Here, secondary characteristics are used to differentiate the product e.g. waterproofness. In such circumstances, styling also becomes very important. The counter-attack by the Swiss watch making industry on Japanese

competitors was the Swatch – unusually a late-cycle product that combined a sharply differentiated style with low cost.²²¹

❖ Control points arise for a wide variety of reasons:

Copyrights: Disney's Mickey Mouse

Patents: Eli Lilly's Viagra

Becoming the industry standard: Microsoft's Windows.

Government issued licenses: Vodacom's cellular license network.

Strangleholds over distribution channels: Coca-Cola's equity links with its bottlers plus 'lending' of coolers to retailers on condition that they store only Coca-Cola's.

Ownership of a limited resource: Anglo Platinum's control of its South African platinum group metal ore-bodies.

Control over key skills: Liverpool Football Club's contract with Michael Owen.

Geographical advantages: the Caribbean's tropical beaches and sunshine; the Swiss Alps for skiing; Africa's safari circuit.²²²

Pricing power reflects how well a producer keeps a hold on consumers with one hand and a tight grip on suppliers with the other.

²²¹ It is possible to argue that when a product whose attraction was based on a technical function must migrate towards styling as its key selling point, commoditization threatens – Apple's Cube would be a current example here.

²²² As with all these control points, they are unlikely to be forever, take the limitations of geography.

"In many ways it was the very success of the Mamluk sultanate (in Cairo) that pushed Europe to overtake it. In the 14th and the 15th centuries Cairo exercised a near monopoly of trade to the Indies. Its rulers, ever fearful of palace intrigue, ever pressed for money to buy and maintain new generations of slave soldiers, clamped increasingly crippling duties on commerce. By one Sultan's decree in the 1430s, for instance, the price to European traders for a load of pepper – bought in India for two dinars and exchanged at Mecca for ten – was to be no less than eighty dinars. "Because this city is situated where she is," complained one Venetian of Cairo, "merchants cannot do else than come there and allow themselves to be devoured at the Sultan and his officials' will." In time, Europeans found they could do otherwise. Aside from beginning to manufacture of their own goods, they sought new trade routes. By the end of the fifteenth century Iberian

The word 'durability' reflects both 'hardness' and being 'long-lasting', from the Latin word 'durare' meaning 'to harden, to endure, to last'.²²³ A product lifecycle is above all characterised by its durability, echoing a Benthamite logic that the longer a product creates value, the more valuable it will be.

Durability has two distinct facets:

1. How high can pricing power be pushed?

Amplitude – the height of the PLC curve above the cost of capital line, a measure of pricing power at a given point in time that reflecting the 'room for manoeuvre' a company has between the market nexus and the cost nexus thereby permitting it to sustain its value-added margin.

2. How long can pricing power endure?

Duration – the time-related ability a company has to resist the downward pressures of purchasing power against its continuing ability to reduce unit costs, thereby allowing it to maintain its pricing power and continue to make a profit.

There is a necessary time dimension to durability, but it is not as time critical as it might appear at first glance.²²⁴ *The most important aspect of durability is*

sailors – having improved the performance of their square-riggers by adding lateen sails copied from the Arabs – had discovered the New World and rounded the Cape of Good Hope." Rodenbeck M, 2000

²²³ Chambers Dictionary of Etymology, ed, 2000

²²⁴ There are cases of a price being paid before the product has been made. The author Amy Jenkins was advanced £600,000 for a book not yet written. Source: Louise Moore, Editor of Penguin Books, private

that pricing power be translated into sufficient value-added margins, earned over whatever period, for the upfront investment to be recouped in present value terms. That said, there *is* a trade off between amplitude and duration: the shorter the duration, the greater the amplitude must be if a product is to be value-creative over its lifecycle.

Hollywood conventional wisdom has it that if a blockbuster has not recouped its production costs in gross ticket sales within 6 to 8 weeks of its US opening, it will be a flop. This is because the 'fade' is nearly always dramatic: the screens the film was occupying will be replaced by new arrivals on the circuit.

Duration is increasingly a function of how rapidly information is disseminated into the market, both among rival suppliers and consumers. Generally, information does appear to be 'bleeding' more quickly thereby reducing the duration and potentially the durability of PLCs; only if higher amplitudes can be obtained in the shorter time available would durability be preserved. This 'bleed' happens through a number of routes: lower cost imitation from copy-cat competitors, shorter 'fad' lives amongst consumers and quicker introduction of newer, more advanced versions from R&D-driven rivals.

The example of digitisable knowledge – the feedstock of the New Economy – that can be disseminated almost instantaneously over the Internet is instructive. Such items must be copyrighted to be durable. But this may not be sufficient if technological advances bypass legal rights. Though the music industry appears to have won their battle with Napster regarding Internet distribution of sound recordings in MP3 format, it remains to be seen whether *any* laws can be

communication. Gregory Mankiw got an advance of \$1.4 million for the 'New Samuelson', his *Principles of Economics* (*The Economist*, 23.8.1997)

enforced against peer-to-peer swapping technology; Israel-based iMesh and Netherlands-based KaZaa already threaten this US legal decision²²⁵.

Within durability other sub-concepts occur, each showing how control points can be defended. **Ratchetivity**, the (increasingly rare) ability to raise nominal prices, is a practice epitomised by the US cigarette manufacturers: their annual increase is announced simultaneously suggesting intra-industry collusion. **Branding** aids durability by setting a product apart from its substitutes thus forestalling pricing power erosion: advertising attempts to reinforce a psychological control point by persuading the consumer that *'this product, by being different, deserves a price higher than a rival, less special equivalent'*. **Franchises**, geographically defined control points, often permit market segmentation that allow a seller to 'cherry pick' sub-markets according to their ability to pay. **Mass customisation** is the ultimate form of market segmentation. Modern production techniques that allow for each product to be individually tailored – Ford's goal is a customised car, assembled and delivered within five days – combine the advantages of economies of scale with giving the consumer their 'own' product; the hope is that customers will 'pay up' for this privilege.

Durability reflects the degree of the success that a supplier has, through using pricing power, in turning a capital investment to good account.

²²⁵ *New York Times*, 20.7.2001

As was noted in Section 3 above, the evolution of a product's pricing power almost certainly has its roots in the changing organizational structure of its producing industry.

This observation highlights the place – or more specifically *the lack of it* – of perfect competition in the world of the product lifecycle. In doing so, it will confirm Sraffa's reservations about the irrelevance of perfect competition to the real world of business²²⁶, but in such a way that not only does *not* banish the concept to oblivion but rather – by defining precisely what it does not mean rather than estimating what it might – brings it into sharper focus.

What emerges is that, as Schumpeter noted, perfect competition is largely 'wishful thinking'²²⁷. Perfect competition *requires* the existence of perfect information, not just in the sense of that for the here and now but also in the sense of perfect foresight about the future. And if it is accepted there will never be perfect foresight, it follows that there will never be perfect competition.

Competition not only understands this but also is predicated upon it.

*Competition among agents... has merit solely as a device to extract information optimally. Competition per se is worthless.*²²⁸

The implication here is that the more optimal the extraction of information, the more advantage will *generally* accrue to the extractor in the form of profit. But when there is insufficient information left to be extracted from a given market

²²⁶ Sraffa P., 1926

²²⁷ Schumpeter J., 1942

that would translate into true profit – a status that occurs in the product's lifecycle at commoditization – competition becomes largely meaningless.²²⁹

In this sense, the very phrase 'perfect competition' becomes an oxymoron: in the idealised world of perfect competition, *there is no purpose for competition as there is information to extract and so no reward for which to compete.*

Juxtapose this observation with the related view of Frank Knight that all profit is the consequence of monopoly and uncertainty²³⁰, and the role of financial capital is then brought into sharp focus. If capital is risked in anticipation of the reward of profit, those owners following the rules of financial economics would never invest it where there is no profit potential – in particular where information and competition are 'perfect' – for such an action would be incompatible with capital's very *raison d'être*.

The PLC approach also raises fundamental reservations about the second main concern that Sraffa had: the applicability of partial equilibrium analysis to the theory of value²³¹. The neoclassical school explained the value of a good in terms of its equilibrium price. This would be where the quantity demanded – the amount that consumers are willing and able to buy – matched the quantity supplied – the amount that producers are 'willing' and able to sell.

What the study below will underline is that industries in the final Round of the PLC – herein called the Sinking Ship – are usually 'willing' to sell more than they 'should', if they adhered strictly to the dictates of capital. This should

²²⁸ Holmstrom B., 1982

²²⁹ See also Jagdish Bhagwati's related comments in [Section 3h – C\)](#) below on the new emphasis of 'contestability' over 'market share' in anti-trust theory

²³⁰ Knight F., 1921

²³¹ Kurz H., Salvadori N., 1998

mean producing only up to the point where the cost of capital is covered – the point of commoditization – and no more. Yet arguably, there will come a time in the dynamics of the PLC where the neoclassical ‘equilibrium price’ can only be obtained by overruling the strictures governing the efficient use of capital, and producing beyond that point of commoditization.

In his *‘Economics of Global Turbulence’*, Brenner suggests we must develop:

*...a theory of a malign invisible hand to go along with Adam Smith’s benign one – a theory which can encompass a self-generating series of steps resulting from individual (and collective) profit maximising which leads not towards adjustment, but rather away from it.*²⁴²

Producing in the ‘Realm of Abundance’ – where that ‘*malign invisible hand*’ operates – does not allow for an equilibrium that owners of capital would seek out. On the contrary, it produces a malign result – the destruction of their capital – that they would actively seek to avoid. And yet many players have little option but to continue behaving in ways that destroy capital, moving away from an equilibrium that is benign in that it is also value creating towards a destination that is malign in that it is value destructive ultimately ensuring their own demise. Competitors in the Realm of Abundance usually end up digging their own graves.

If the point of commoditization were itself somehow stable and *no* owner of capital on the supply side wanted to move from it, some sort of second best solution might be possible. But as will be illustrated below, in the real world, it is extremely unlikely that such a second best solution will endure. Critically, the point of commoditization is a *weighted average* for an industry.

²⁴² Brenner R., 1998; emphasis in original

Consequently, assuming not all firms have the same size and cost structures, it suggests that, at commoditization, less efficient firms have already started to destroy value even if the more efficient are still creating it in equal quantity.

Furthermore, it is perfectly reasonable for the individual firms that have not started to destroy value at this point to continue producing further output: individually they are still value creators even if collectively their industry is not. (Even though Compaq, Hewlett Packard and Gateway *et alia* have collectively destroyed more value in the personal computer industry than Dell has created in 2001 – Dell's profit: \$361m vs. rest of industry loss \$1.1bn²³³ – 'should' this stop value-creating Dell from selling another unit? Given that Dell *can* still cover its cost of capital by selling another unit, hardly surprisingly, Dell is selling more.)

Thus even the point of industry commoditization is unstable, and logic suggests that new supply will continue to be forthcoming at least until the last individual firm in the industry is no longer capable of creating value *for itself*. (Furthermore, for reasons related to the traditional (and lax) definition of 'profit' used for accounting and tax purposes, as well as to cashflow and to barriers to exit faced by capital, individual firms frequently *do* continue producing further output even when it is destructive of the capital still embedded in their operations to do so.)

Acknowledging financial capital, and in particular the cost of capital, as a (and arguably 'the') fundamental variable in the model of value creation removes the product lifecycle model as applied herein from the Walrasian framework and its associated theory of value.

²³³ *BusinessWeek*, 24.9.2001; year-to-date

Firstly: Capital and perfect competition cannot co-exist within the same conceptual universe. The *best* one might argue is that the siren call of perfect competition grows louder as commoditization looms. But a producing vessel with its cargo of capital cannot, by its very definition, reach the idyllic shores of the Island of 'Wishful Thinking'. Any vessel that did flounder on the rocks of this Avalon would have another oxymoron as its cargo: valueless capital.

Secondly: Capital and partial equilibrium are mutually exclusive too. The *best* one can argue here – and this point will be developed below – is that some sort of dynamic equilibrium can temporarily exist in an industry when it is still value creating. This will be when the individual suppliers of a given product pursue their own paths of profit maximization (perhaps collusively) and collectively carve out an industry path that extracts close to the greatest amount of profit from a given opportunity, given the changing variables that will affect both supply and demand. But as soon as commoditization threatens (let alone when it is reached), the owners of capital embedded in the various competing firms will become unhappy even with this dynamic equilibrium and want to remove their capital so that it can be more productively employed elsewhere.

This prompts the image of capital in eternal motion, being sown to create value then being reaped to avoid destroying it only to be replanted again in search of new value creation. This is the image championed by Schumpeter: *'...the same process of industrial mutation – if I may use that biological term – that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.'*^{23A}

^{23A} Schumpeter J., 1942

The PLC approach thus allows for a model to be built that would not conflict with the main reservations raised by Sraffa in 1926.²³⁵

One detects that Keynes was grappling with these issues in Chapter 11 of *The General Theory*. Also Prompted by Irving Fisher's *Theory of Interest*²³⁶, he highlighted the point where the marginal efficiency of capital falls below the interest rate and so where '*it is not profitable to produce*'.^{237 238}

Even so, Keynes's approach was still mainly 'macroeconomic', hardly surprising given the demands of the time. By contrast, the approach here is micro as it focuses on the industry dynamics surrounding a single product's life. Yet the product lifecycle approach *is* 'macro' in the alternative sense that it *does* look at an industry and '*not only relate to the goods produced by a particular firm*'²³⁹. By detailing the supply curve of output for a single product *over its whole life*, it also allows examination of '*the process of diffusion of profits through the various stages of production*'²⁴⁰. This answers one of Joan Robinson's suspicions about Sraffa that, in his preoccupation with supply curves, he was onto something but that '*his objections do not apply to the supply curve of output (as a whole)*'²⁴¹. Using the PLC does precisely this at the product level. The second half of this thesis will extend this logic to the national level.

²³⁵ It even allows for a case to be made that financial capital is the '*basic commodity*' that Sraffa was referring to in his 1960 magnum opus, '*The Production of Commodities by Means of Commodities*'.

²³⁶ Fisher I, 1930

²³⁷ Keynes J.M., 1936

²³⁸ He was to refer to Sraffa's coalescing thoughts on the relationship between capital and the rate of interest, specifically in Chapter 17.

²³⁹ Piero Sraffa, 1926

²⁴⁰ *But these are mainly aspects of the process of diffusion of profits throughout the various stages of production and of the process of forming a normal level of profits throughout all the industries of a country. Their influence on the formation of the prices of single commodities is relatively unimportant, and their consideration is therefore beyond the scope of this article.* Sraffa P., 1926

²⁴¹ *I think that, like the rest of us, you have had your faith in supply curves shaken by Piero. But what he attacks are just the one-by-one supply curves that he regards as legitimate. His objections do not apply to*

4i) The Character of Capital II: Barriers to Entry and Exit

By focussing on financial capital by understanding its cost, it is possible to re-interpret the function performed by barriers to entry in a competitive market. They exist as a gauntlet for entrepreneurs and their capital to run – indeed, who are these barriers for if they are not for entrepreneurs and their capital?

What precisely is a gauntlet? It is a process whereby the differing time preferences of potential suppliers of inputs to a productive process (inputs which have a cost and so by definition capital embedded in them) are assessed by an entrepreneur who believes that by acquiring (or simply 'renting') various inputs from other suppliers, creating a product and later realising that product's end-value in a market sale, that entrepreneur can sell the end product for more than it cost to make. Only then would such an entrepreneur earn a true profit, one capable of covering the cost of the capital needed to make a given product.

An entrepreneur that decides to proceed is someone whose judgement about the future is reflected in a less steep discount curve than the weighted average of the owners of those inputs that must be utilized if that entrepreneur is to turn his ideas to profit. If his judgement turns out to be correct, his pleasure is profit; if not, his pain is loss. It is as if the entrance to the market for producing a given product is 'picketed' by a set of discount curves representing payments that must be made to those inputs required to breach that market. Some of those costs must be paid upfront; others, including money borrowed from banks, will be contracted for up front but borne during the production process; finally the cost of the equity capital also required to fund the venture must be imputed, ***but this makes it no less of a cost that must be borne.*** For the entrepreneur who,

supply curve of output (at a whole) – but however help us when he starts thinking out objections that do

upon reflection, decides not to enter the market because his discount curve is more steep than the weighted average discount rate he would have to beat to succeed in that market, he has been turned back by the barriers to entry that 'defend' that market.

Barriers to entry are the nexus through which the differing views of the owners of capital (in all its varied input forms) as to what their capital is worth must be mediated before an entrepreneur decides to enter a given market. The cost of capital – *capital's price* – is the resolution of that mediation. (This explains why, in corporate finance, the price of capital is determined by a single discount rate representing the weighted average of the underlying capital value of all the inputs that must be employed: *the weighted average cost of capital*.)

National borders represent a more complex form of barrier to entry. Crossborder investment usually involves crossing a more daunting picket line composed of a wider set of discount rates, one of which is the country risk component included in the combined cost of capital implicit in that foreign investment opportunity.

Barriers to exit involve essentially the same logic but in reverse. Following the point of commoditization (and even leading up to it), the tension between the owners of a firm's capital and its corporate managers will likely become more pronounced. (This may explain why a commoditized company like Cargill can continue to operate: it is a private 'family' company thereby substantially narrowing the differences between the ultimate owners of its capital and its temporary managers: while not synonymous, these two groups substantially overlap.) At (or approaching) commoditization, it is the owners of capital

whose discount curves have become steeper; simply put, they start to want their capital back. The corporate management – who by now have most likely become entrenched with perhaps only ‘token’ ownership in the equity capital of the company – have less steep curves so far as their management of that capital is concerned: crudely put, they would usually rather keep their jobs.

Governments, who have a social interest in maintaining employment (more for the entire workforce than the management!), often erect ‘two-faced’ barriers to exit: either the ‘friendly’ variety that persuade firms to remain or the ‘unfriendly’ variety that penalise firms when they leave. The former delay departure by employing such ‘carrots’ as tariffs on imported rival products, concessionary finance or direct subsidies such as farm aid. The latter coerce staying by employing such ‘sticks’ as taxes on any unrealised capital gains²⁴², insistence on costly lay-off packages for those that might lose jobs, or prior completion of environmental clean-ups for curtailed operations.²⁴³

If the barriers to exit are too high, capital becomes stranded. The salvage costs (which are usually mostly payable upfront) may be too high to recoup the potential opportunity gains (which are often not fully realised until later). This will leave capital trapped in a firm like a Titian on the Titanic²⁴⁴: valuable in other circumstances, but too costly to save given the opportunity costs facing the savers!

²⁴² Such taxes are on gains that in true value-creating terms may actually be capital losses: governments, not surprisingly, do not make the distinction!

²⁴³ Such ‘legacy’ costs can be huge: the struggling US Steel Industry in aggregate has a contingent liability of over \$13bn; Bethlehem Steel alone has 130,000 ex-employees and dependents to provide for, compared with 13,000 current employees. One manager likened the situation to one of negative equity more common in the property business: ‘Like owning a \$100,000 house with a \$200,000 mortgage’. *The New York Times*, 5.12.2001; *The Financial Times*, 5.12.2001

²⁴⁴ The most famous painting lost on the Titanic was arguably Blondel’s ‘*La Circusienne Au Bain*’.

4 j) The Character of Capital III: Answering Joan Robinson's famous – and famously coarse – question

Largely inspired by Piero Sraffa's '*pregnant suggestion*'²⁴⁵ that the whole Theory of Value can be treated in terms of monopoly analysis, Joan Robinson wrote '*The Economics of Imperfect Competition*'²⁴⁶. This eventually led her to initiate the '*Great Capital Controversy*' at Cambridge University with her article on the Theory of Capital in 1953.²⁴⁷

In the course of one heated discussion, Joan Robinson, with characteristic bluntness, asked:

*What the #### is a unit of capital?*²⁴⁸

The impetus behind the suggested answer that follows comes from evolutionary biology. The logic behind employing such a metaphor is not new; indeed Marshall wrote that '*The Mecca of the economist lies in economic biology...*'²⁴⁹. This is a return compliment; Darwin and Wallace both credit Malthus as inspiring them (independently) to come up with the concept of natural selection.²⁵⁰

Building on this tradition of cross-fertilization, the definition of capital used herein is as follows:

²⁴⁵ Quoted in 1999 *Encyclopaedia of International Political Economy*

²⁴⁶ Robinson J., 1933

²⁴⁷ Robinson J., 1953

²⁴⁸ Cited by Taylor K.S., 1996

²⁴⁹ Marshall A., 1890

²⁵⁰ Quammen D., 1996

A unit of capital is akin to a metaphysical gene that prospers when invested in an environment where it can be reproduced. Traditionally the body corporate into which a capital gene has been invested was (and largely remains) a limited liability company. But in an age where intellectual property is of increasing value, this capital is increasingly invested in the ultimate form of body corporate, the human being, by way of education, thereby transforming it into knowledge and potentially intellectual capital.

Investment selection can be seen as being akin to natural selection; it approves of those body corporates which use capital genes efficiently and disapproves of those that do not. This approval process centres on the idea that 'fit' body corporates recreate value from their capital endowment whereas 'unfit' body corporates destroy it.

Broadly accepting capital's Clark-Knight conception of being a 'quantum of productive wealth'²⁵¹ that is essentially a 'monetary measure'²⁵², if capital is the *numéraire* of all value as expressed in financial terms, it cannot be regarded as a 'normal' factor of production. Not only would capital be, though Samuelson thought otherwise, a substance that 'transmutes itself from one machine form into another like a restless reincarnating soul'²⁵³, more broadly it would be embedded in every other factor of production as well – including pointedly 'labour' – and thereby, as their common denominator, be the *unifying underlying* factor of production. This would suggest – notwithstanding the rivalry of the Clark/Sraffa traditions in capital theory – that financial capital might also be regarded as Sraffa's one 'basic commodity' that enters into the production of all other items²⁵⁴.

²⁵¹ Clark J.B., 1899

²⁵² Knight F.H., 1933

²⁵³ Samuelson P., 1962

²⁵⁴ Sraffa P., 1960

It further suggests that capital – ideally in its growth, at least in its preservation – is the object of the economic game, even if man is its subject. Samuelson was loath to accept capital as ‘a restless reincarnating soul’²⁵⁵; yet, after Dawkins²⁵⁶, it could be likened to being the ‘selfish gene’ of financial economics. Only when the wider realm of political economy is considered do we shift the central focus away from servicing the self-interested needs of ‘genetic’ capital towards serving the needs of the broader body politic of humanity. But in doing so, we may end up compromising the *apolitical* essence of capital value creation in the process.

This parallel between financial capital and genes, while close, is not perfect – for instance, financial capital is assumed to be homogenous whereas genes are not. But there are many other aspects in the analysis that follows that can be seen to have equivalents in the biological world. For instance, stranded capital trapped in a company and unable to escape is remarkably similar to genes that might get stranded in a dying species. They could be ‘useful’ if they could be somehow redeployed, but that does not happen and so the otherwise ‘valuable’ genes go down, again like Titians on the Titanic, with their carrier.

²⁵⁵ Samuelson P., 1962

²⁵⁶ Dawkins R., 1989

4 k) The Character of Capital IV: Bovine Insights

It has long been recognised that cattle were instrumental in helping fashion the character of capital and wealth in human society. Not only do the English words '*capital*' and '*cattle*' share the same root²⁵⁷, the Hebrew word for '*herd/flock*' – *ashtoroth* – is closely related to its word for '*wealth*' – *ashiruth*²⁵⁸.

Few have given this idea a firmer grounding than Jared Diamond²⁵⁹, who attributes the natural distribution of species suitable for domestication – '*an accident of biogeography*'²⁶⁰ – as one of the main reasons why Eurasia led the world in economic development. In this sense, Eurasia had more endowed *capital* than any other region.

	Eurasia	Sub-Saharan Africa	The Americas	Australasia
Candidates	72	51	24	1
Domesticatable Species	13	0	1	0
Percentage Domesticated	18%	0%	1%	0

Diamond gives six criteria as to what made an animal a serious candidate for domestication – criteria which have equivalent meaning so far as the prosperity of modern day capital is concerned. The species had to:

²⁵⁷ 1998 *Chambers Dictionary of Etymology*

²⁵⁸ www.aish.com

²⁵⁹ Diamond J., 1999

²⁶⁰ Diamond J., 1991

1. *have a high rate of conversion of food biomass into consumer biomass* – today's owner of capital measures capital productivity by how much output returns exceed input costs.
2. *grow quickly* – a capital investment with a 'short payback period' is particularly favoured.
3. *be able to reproduce in a captive environment* – today's owners of capital are predisposed towards allowing capital to prosper in a legal entity, be it a 'closed' or 'public' corporation.
4. *not have a 'nasty disposition'* – capital's owners prefer hostile conditions (such as capital gains taxes) not to be attached to its use.
5. *not have a tendency to panic when threatened* – an owner prefers capital to be employed in an environment where it will not easily scare and run away, as FPI did in Thailand in 1997.
6. *be able to have a social structure that could accept man as its head* – as man is capital's owner and utiliser, this goes without saying.

Healthy cattle (and other livestock) produce 'dividend income' while still alive in the form of milk (and for sheep, wool) and, when culled (in *the* classic example of 'joint production'), are used not just for meat but leather, soap, bone implements and clothing fibres.²⁶¹ Furthermore, oxen in particular are still used in agrarian societies for pulling ploughs and threshing crops.

²⁶¹ The Maasai of East Africa still employ cattle for all these uses – even using cow's blood mixed with cow's milk as their everyday staple food; the urine is used for medicinal purposes; the dung to cover their houses. They also use cattle as a critical item in their own reproduction – it pays their 'bride prices', and even attracts the bride! The song sung by a young woman to the warrior she loves says: '*Mee osingolio*

De Soto²⁶² also notes that cattle possess qualities that allow for the storing, growth and transmission of wealth, their being low maintenance possessions not costing much to keep, mobile and can be moved away from danger and easy to count and measure²⁶³. He reinforces Diamond's point about wealth generation:

*But most important, from livestock you can obtain additional wealth, or surplus value, by setting in motion other industries, including milk, hides, wool, meat and fuel. Livestock also have the useful attribute of being able to reproduce themselves.*²⁶⁴

Such reproduction is the ultimate payback – from one unit of cattle, another.

kisiaje nemeo ongopiro natii elpapat, kisiaje ilooitong' oseroo lalaram onaree irrepeta. ('It is not your dancing nor your feather in your hair that attracted me, but rather your big herd of cattle which tramples the bush and clears the forest passes. It is this which deserves praise.') Tepelit Ole Saitoti, 1980, who adds: It is through their cattle that the Maasai have earned their self-sufficiency. It is no wonder, then, that they consider little in the world to be of equal value.

²⁶² de Soto H., 2000

²⁶³ One can add that through proper cross breeding, the stock could be upgraded and so made more valuable.

²⁶⁴ de Soto H., 2000; emphasis added

Section 5. The Micro Case Studies

The Evolution of the Product Lifecycle's 'Six Rounds'

Each Case Study examines the six influences that would shape the industry PLC faced by the six cited companies²⁶⁵. The six influences follow on from [Section 3b\)](#) and are as follows:

- A: The Purchasing Power of Consumers
- B: The Price-Setting Power of the Producer
- C: The Competitive Environment faced by the Company
- D: The Cost Structure faced by the Company
- E: The Company's Ability to Regenerate its Products
- F: The Capital Market's Perception of the Company

5 a) Rising to Brenner's challenge

This section meets Robert Brenner's challenge.

If we are to understand not only the historical regularity of secular capitalist development, but also the historical regularity of secular capitalist downturn, we therefore need a theory of a malign invisible hand to go along with Adam Smith's benign one – a theory which can encompass a self-generating series of steps resulting from individual

²⁶⁵ General reference books for Section 5 included in particular Besanko D., Dranove D., Shanley S., 2000; Knox P. and Agnew J., 1998; Dicken P., 1998. Other books referred to include: Pine B.J. and Gilmore J.H., 1999; Pine B.J. and Gilmore J.H., 2000; Loewen J., 1999; Kantor R.M., 1995; Drucker P., 1999; Ohmae K., 1999; Ohmae K., 2001; Stutz F. and De Souza A., 1998

(and collective) profit maximising which leads not towards adjustment, but rather away from it.

Brenner's words serve as an introduction for this section.

I shall present an account ... which finds the source of the profitability decline, schematically speaking, in the tendency of producers to develop the productive forces and increase economic productiveness by means of the installation of increasingly cheap and effective methods of production, without regard for existing investments and their requirements for realization, with the result that aggregate profitability is squeezed by reduced prices in the face of downwardly inflexible costs.

I shall explain the perpetuation of the crisis by demonstrating that the profit-maximising steps capitals find it rational to take in response to the reduction in their profitability not only fail to resolve the problem that brought down profitability in the first place, but have the effect, in aggregate, of making necessary and rational additional responses which further undercut aggregate profitability.

In the face of their reduced profitability, numbers of firms thus find that it makes most sense to persist in a line rather than leave it and search for a better alternative; meanwhile, numbers of other still lower-cost producers find it individually profitable to enter into the same lines despite the lines' reduced profitability. As a consequence of the resulting consolidation of over-capacity and over-production and of reduced profitability (or the even further fall thereof), investment and output growth will decline and wage growth will be cut back, leading, in turn, to both a decline of productivity²⁶⁶ growth and a decline in the

²⁶⁶ Brenner uses the term productivity here in its more traditional sense

*growth of effective demand (both investment and consumption), which put still further downward pressure on profitability.*²⁶⁷

Section 5c) describes a ‘*series of steps*’ – the Six Rounds – which detail how firms (in Brenner’s and, before him, Smith’s word, ‘*capitals*’) pursue profit maximization. Initially they operate under the conditions of Adam Smith’s ‘*benign hand*’; here they are profitable and create value. By Round 6, they operate under the conditions of Robert Brenner’s ‘*malign hand*’; here they are not profitable and destroy value.

By way of introduction to these case studies, the chart in **Section 5b)** shows how *an owner of capital* might react to developments in the conditioning factors affecting the evolution of the product lifecycle. Because Round 1 more precisely captures an event – *the IPO* of VA Linux – that would launch the lifecycle rather than constitute an examination of the nature of the business itself as do Rounds 2 to 6, it is excluded from this tabular summary. In the event, the pricing power of VA Linux’s share was short lived: within 7 months of the IPO, the ‘value lifecycle’ had fallen below the \$30 offer price.

Section 5d) concludes the micro case studies by using ranking methodology to tie together the strength of pricing power with the market rating accorded by capital to a company with that pricing power.

The most critical feature to observe is that when a company is doing well, it is rewarded with a lower cost of capital, a fact that thereby allows it to do even better. But when the market decides that a company has ‘lost it’, it is punished with a higher cost of capital, which in turn makes it do even worse. The ‘positive double whammy’ usually takes place in Round 1 – Hot Cakes – when

²⁶⁷ Brenner R., 1998; emphasis in original

the rise of the PLC is at its sharpest incline and this when capital is on offer at its cheapest rate²⁶⁸. Its equivalent 'negative double whammy' usually happens in Round 4 – the Slippery Slope – when decline of the PLC becomes most pronounced and so when capital becomes sharply more expensive²⁶⁹. Whilst both '*tipping points*²⁷⁰' do reinforce a logical trend, it is not unusual for these trends to be exaggerated by capital markets driven by, in the words of Charles Mackay, '*extraordinary delusions and the madness of crowds*'.²⁷¹

Both tipping points would radically alter the value-creating prospects for a product thereby playing a critical self-reinforcing role in the subsequent evolution of its lifecycle.

Paul Ormerod has noted that it can be very difficult to reverse the self-reinforcing process by which products and technologies gain dominance in markets²⁷². In capital markets too, there are times when a herd-like behaviour dominates capital movements²⁷³ and a hot stock can do no wrong. But as and when a reversal of fortune does set in, what might be termed the 'negative externality' of the capital markets means that the affected company's fall from capital's grace can be as dramatic as was its rise. Bagehot's erstwhile '*blind capital*'²⁷⁴ suddenly sees with startling clarity.

²⁶⁸ This is also when the first and second derivative trends are moving in the same positive, upward direction.

²⁶⁹ This is also when the first and second derivative trends are moving in the same negative, downward direction.

²⁷⁰ A term given its own 'tipping point' in terms of current usage by a book of the same name – *The Tipping Point* by Malcolm Gladwell, 2000

²⁷¹ Mackay C., 1841

²⁷² Ormerod P., 1998, especially Chapter 11

²⁷³ As with cattle!!

²⁷⁴ '*At intervals, from causes which are not to the present purpose, the money from these people - the blind capital, as we call it, of the country - is particularly craving; it seeks for some one to devour it, and there is a 'plethora'; it finds some one, and these is 'speculation'; it is devoured, and there is 'panic'.*' Quoted in Feldstein M. (editor), 1991

A high profile recent example for the latter was the *'day the music died'* for Tyco.²⁷⁵



Capital is not a passive passenger in its reproductive employment by companies. It plays an active part in the rise and fall of companies as judge, jury and ultimately executioner.

²⁷⁵ www.cnn.com

	<i>Round 2</i>	<i>Round 3</i>	<i>Round 4</i>	<i>Round 5</i>	<i>Round 6</i>
	<i>Splendid Isolation/ Microsoft</i>	<i>Second's Out/ De Beers</i>	<i>Cracks in the Wall/ Gillette</i>	<i>Slippery Slope/ Ford Motor Co</i>	<i>Sinking Ship/ Cargill</i>
<i>Consumer Purchasing Power</i>	Weak, especially where market appetite grows with only one supplier	Now evident but branding offsets consumer power; some look for 'value' option	Growing choosiness means company must deliver quality and value	Strong; consumer pickiness means suppliers at consumer's pleasure	Rampant; divide and rule; company takes whatever prices offered
<i>Producer Price-Setting Power</i>	Strong especially where network effects operate	Still some freedom but increasingly constrained from price increases	Limited to 'new' features commanding new mark-ups	The best that can be hoped for is to limit downside pressure on prices	Non-existent; takes whatever price is on offer;
<i>Competitive Environment</i>	No competitors but risk of competition rising	Once entry occurs, could become fierce very quickly	Perhaps the most competitors numerically; fierce competition	Consolidation may not lessen fierceness of competition	Effectively irrelevant; could be dispersed or concentrated
<i>Cost Considerations</i>	Lip service paid, but fat margins do not encourage discipline	Now an important consideration; volume gearing and market share important; scale economies grow	Margin squeeze is increasing and first signs of spare capacity limit output; scale economies vital	Economies of scale curbed by spare capacity; barely covering capital costs	Essential but in the sense of covering circulating capital; cannot cover capital costs
<i>Best Reward for Innovation</i>	Probably the best returns on R&D of the PLC	R&D is vital as differentiation critical; may allow branding	The crossroads: innovate or face commoditization	Innovate to stay in the value creation game	Cannot afford R&D; besides advances are short-lived
<i>Capital Market Conclusion</i>	High growth but tangibly so; capital has a handle on growth prospects	Growth status; above average; capital still enthralled with future prospects	Value Status; going ex-growth can reduce rating sharply towards market average	Cyclical; below market average; equity capital starvation now in evidence	Commoditised; very speculative; attracts virtually no new capital

Colour key, from the owner of capital's perspective:

Best period for this criteria; supports 'high growth stock' status;	Above Average; supports 'growth stock' status	Middling; undermining 'growth stock status'; suggests 'value stock' status	Below Average; undermining 'value stock' status; supports 'cyclical stock' status	Worst; prompts consideration of 'break up'; estimates salvage value
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5 c) The Six Corporate Examples

Round 1: Hot Cakes

The price of monopoly is upon every occasion the highest which can be got.

Adam Smith, *'The Wealth of Nations'*.

The IPO of VA Linux Systems, Inc (VALS)²⁷⁶ – Hot cakes or a hot potato?

Background details

VALS distributes customised versions of Linux software, a free, 'open source' programme that may yet challenge Microsoft's Windows-based hegemony. IBM regards Linux as a technology almost as disruptive as the Internet itself,²⁷⁷ believing that it will become the *lingua franca* for the e-business applications, as free to use as the English language²⁷⁸

IPO Summary Details

VALS shares issued: 4.4 million, 10.6% of the company

Issue price: \$30

Opening price: \$299

Opening premium to subscription price: 897%

²⁷⁶ This section on Linux VA draws on comments in the Financial Press during the past two years. Among articles referred to are: *Financial Times*: 8.8.2000; 25.8.2000; 18.1.2001; 21.2.2001. *The Economist*: 23.7.2000; 19.8.2000. *Yahoo Finance*: 2.19.2000. The website *IPO.com* was the source of nearly all technical data referring to the Linux VA issue. Individual quotations separately cited.

²⁷⁷ *The Economist*, 19.8.2000

²⁷⁸ *Financial Times*, 8.8.2000

This Round is, by virtue of the example chosen, very short term. It begins with the determination of the subscription price (\$30 a share) and ends with the determination of the opening trade price on the following day (\$299 a share).

Furthermore, the product in question is the **quoted share** in VALS; VALS's business is only peripherally relevant.

I-A: The subscribers' purchasing power.

1. VALS's NASDAQ IPO took place on 9.12.1999. During 1999, the NASDAQ index rose 84% from 2208 to 4069.²⁷⁹ This technology-laden market was not only hot but, in traders' jargon, *'on fire'*.

2. Virtually any NASDAQ IPO was guaranteed success in this environment with more than 176 offerings more than doubling on their first day in the 1999/early 2000 period; average first day returns exceeded 60%.²⁸⁰

VALS was not just 'any IPO'; it was the first listed vehicle exposed to a phenomenon that might yet undermine Microsoft's Windows, Linux, a software platform available **free** over the Internet.

3. Given the excessively attractive nature of the issue, purchasing power mobilised to bid for 4.4 million shares being issued was enormous. It was 'inconceivable' that a successful subscriber would lose money on this issue. Using the 'bookbuilding' system, allocation was partly based on spreading the

²⁷⁹ In the first two months of 2000, the index would reach 5048, a rise of 128% over 14 months.

²⁸⁰ mba.tuck.dartmouth.edu/pages/faculty/kent.womack/workingpapers/StrategicUnderpricingV23.pdf

issue wide and, where oversubscription occurred, on a pro rata basis. These features added to the IPO's attractiveness.

4. The 1998/1999 rise of the net-enabled day-trader added a new dimension to investing, especially IPOs. Typical day-traders brought only seed capital to their activities, often even borrowing their ante money. Most subscribers would 'stag' the issue, and 'flip' the shares on the first day of trading. What minimal capital is risked can be leveraged through margin facilities provided by brokers. Any seed capital committed by investors can be magnified many times making the total purchasing power mobilised enormous. This knowledge only made the issue more attractive.

BOTTOM LINE: The purchasing power mobilised for the VALS IPO was enormous, with almost no attention paid to the 'true' underlying value of the shares. A stage-managed issue, it sold 'like hot cakes'.

I-B: The price-setting power of the sellers of VALS shares.

1. With the issue's success all but guaranteed, the sellers' agents used a number of fire-stoking tactics and signalled them to the market in a highly visible way.

2. The first was to restrict the first issued tranche to a small percentage of the total shares in issue – only 4.4 million or 10.6% of the 41.5 million in issue.

3. The second was to 'lock-up' the balance thus starving the aftermarket thereby guaranteeing a profit to successful applicants.²⁸¹ The lock-up of the remaining 89.4% shares lasted six months.

4. The net effect creates 'strategic underpricing' – deliberately 'leaving money on the table' rather than 'clearing the market'; aside from obvious financial benefits, success is also judged by how investors 'notice' the IPO.²⁸²

BOTTOM LINE: The seller's agents knew that 'Doling out IPO shares during the tech stock bubble was...like handing out free money.'²⁸³ By deliberately underpricing the issue at \$30, they 'left honey in the mouths of the investors'. The sellers – in that they owned the remaining 89.4% – were still delighted with the outcome. They realised \$132 million from the sale of 10.6% but, at the first traded price, saw their remaining stake rise in value from \$1113 million to \$11093 million, an increase of almost \$10 billion. VALS was the most successful IPO ever – investors could not but notice the 897% percentage premium of the first trade over the subscription price.

I-C: The competitive nature of the industry.

1. At issue, there was a 'pure monopoly' in the product – shares in VALS – with only one seller, the original shareholders. The lock-up feature minimised aftermarket competition by limiting secondary supply. However 4.6 million shares became, once trading began, tradable; every successful subscriber became a selling 'firm'. The competitive nature of VALS shares moved quickly

²⁸¹ There is a second motive for keeping the share price high in the early Rounds of listing – the shares can be used as payment for acquisitions. Thus it is in the interests of the company's owners to keep the value of their 'currency' high.

²⁸² *Ft.com*, Womack K., *Mastering Investment, Part IX, Reading the Signs from First Day Returns*

²⁸³ *Fortune*, 3.9.2001

from monopoly to the Slippery Slope and even the Sinking Ship rounds, a fact borne out by VALS post-issue trading record – by 30.10.2001, the price had fallen 99.5% from an all time high of \$299 to \$1.29!



BOTTOM LINE: Competition was a factor that would immediately thereafter assert itself after the issue.

I-D: Industry cost structure.

I. Given the product in question, a share traded over a 24-hour period, it is not meaningful to speak of its cost except to note the \$30 a share subscription cost.

BOTTOM LINE: not a conditioning factor in this Round

I-E: Product regeneration.

I. Neither is it meaningful to speak of its regeneration.

BOTTOM LINE: not a conditioning factor in this Round

I-F: The financial character of the industry.

1. There was virtually no risk in subscribing to the VALS issue. Reward was all but guaranteed. Price in such circumstances was *effectively* academic. With the cost of capital very low due to the availability of margin facilities, the likely value-added capital gain was enormous. Though not used as applied in this thesis, one can understand why one observer was moved to note that '*capital has become a commodity instead of a scarce resource*'²⁸⁴. Indeed it was the opportunity for profit that was scarce, not the capital seeking that profit.

2. From the perspective of an investor risking capital in Linux's IPO, and given the cost of that capital, an appropriate return could be obtained; the issue was a 'no-brainer'; the reproduction of any capital risked was all but guaranteed.

BOTTOM LINE: The near 'free' nature of capital available added to the PLC's amplitude.

COMBINED IMPACT OF THE SIX CONDITIONING FACTORS ON ROUND 1 OF THE PRODUCT LIFECYCLE:

There was no factor that was materially pulling down against the rise in the IPO price from \$30 to \$299. The sellers – as continuing 89.4% owners – wanted a higher price. The buyers wanted a higher price, and with the capital required to buy their position all but free, that higher price was all-

²⁸⁴ Strassmann P.A., 1999, *The Search for Productivity*, *Computerworld*, 9.8.1999; emphasis added

but-guaranteed. Which conditioning factor would have stopped the VALS share price from going higher on its opening day of trade?

University of Cape Town

Round 2: 'Splendid Isolation'

The monopolists, by keeping the market constantly understocked, by never fully supplying the effectual demand, sell their commodities much above the natural price, and raise their emoluments, whether they consist in wages or in profit, greatly above their natural rate.

Adam Smith, '*The Wealth of Nations*'

Microsoft – Sleepless in Seattle?²⁸⁵

II-A: The purchasing power of Windows' buyers.

1. The software industry possesses characteristics that have forced revisions in traditional economic commentary about the firm. The two issues most often cited are 'network externalities' and 'the near zero marginal cost of the second and subsequent units of production'. The first suggests that once a critical level of penetration has been achieved, the more people that use the product, the more useful it will be – a rare case of *increasing* marginal utility.²⁸⁶ This supports further adoption of the product within the market place – demand begetting demand. Positive externalities arising from widespread adoption of Windows have kept consumer purchasing power in check. For many prospective buyers of software programmes, there is a material disadvantage in

²⁸⁵ This section on Microsoft draws heavily on comments in the Financial Press during the past two years. Among articles referred to are: *Financial Times*: 26.7.2000; 7.8.2000; 10.8.2000; 3.10.2000; 18.10.2000; 12.12.2000; 18.1.2001; 23.1.2001; 31.1.2001; 7.2.2001; 14.2.2001. *BusinessWeek*: 22.11.1999; 6.12.1999; 10.4.2000; 17.4.2000; 24.4.2000; 8.5.2000; 15.5.2000; 22.5.2000; 5.6.2000; 19.6.2000; 31.7.2000; 22.1.2001. *The Economist*: 8.4.2000; 10.6.2000; 7.10.2000. *The New York Times*: Paul Krugman's Columns of 29.4.2000; 6.11.2000; 9.4.2000; 4.26.2000. *Fortune*: 15.5.2000. *Merrill Lynch Stock Report*: 19.1.2001. Individual quotations separately cited.

²⁸⁶ Metcalfe's Rule: 'The value of a network is the square of the number of people connected to it.' Quoted on Hal Varian's website: <http://www.sims.berkeley.edu/~hal/>

buying a rival programme arising from incompatibility of that programme with the vast majority of networked users.

2. With business moving into cyberspace, not being wired is not an option. That connection, where done through a PC, is best done through Windows.

3. Customers cannot buy 'imitation Windows' as Microsoft's intellectual property is copyright protected.

4. Once 'hooked' onto Windows, a near-involuntary imperative exists to upgrade regularly – MS-DOS to Windows 3.0, '95, '96, '98, 2000, ME and now XP. Microsoft, by cannibalising its previous offerings, creates several 'quasi-annuity' sales.

5. Microsoft's hegemony is encountering resistance, *anti-trust issues aside*.²⁸⁷ The open source movement – led by Linux and Sun – is giving sophisticated buyers options, with core programmes available free. This increases consumer purchasing power. Furthermore, the centre of computing gravity is moving from PCs – a Microsoft 'colony' – to the Internet and hand-held devices – which are not.

BOTTOM LINE: Purchasing power is a function of consumer need matched by ability to afford. Where strong appetite and money co-exist with only one supplier, consumer purchasing power is weak. But, as Microsoft is discovering, not only does competition eventually find a way in but, if 'control points' persist, competitors shift the centre of gravity. By blurring the

²⁸⁷ This begs the question as to whether the Libertarian approach to anti-trust in today's world – notwithstanding network externalities – may not have a case. One lawyer involved in anti-trust even quoted me Thucydides: "Hegemony kills itself".

edges of the market, purchasing power then spreads across a wider group of suppliers, increasing consumer purchasing power as a result.

II-B: Microsoft's price-setting power.

1. A company with significant influence over price determination can often exploit purchasing power weakness. In Microsoft's case, it has not aimed 'to kill the goose that lays the golden egg' by maximizing possible price²⁸⁸. As in the VALS IPO case, Microsoft's prices Windows artificially *low*. This wins Windows converts, reinforcing addictive network effects.²⁸⁹

2. Microsoft has '*not so much clients as hostages*', OEM computer suppliers selling 'tied in' Windows software. Microsoft favours loyal and volume clients with lower prices, an 'abusive' practice according to anti-trust authorities.

3. Once the network effects take root, Microsoft 'bundles' additional Windows family offerings further reinforcing its stranglehold on consumers and adding to price-setting power. Because Microsoft rarely discloses its source code, most secondary software *must* be sourced from Microsoft or its allies.

4. Copyright protection underwrites Microsoft's price-setting power by enforcing its 'legalised monopoly'. Selling prices cannot be influenced by other Windows sellers – although pirated software is an issue – and only scant attention is paid to other software prices.

²⁸⁸ Krugman P., *New York Times*, 29.4.2000

²⁸⁹ Paul Krugman, in expressing his reservations about the Microsoft anti-trust decision, suggests that neither of the two companies that might arise from the enforced split would have any of their own reservations about pushing their respective pricing powers to the level that the market would bear, suggesting rising prices and a consumer who would be *worse* off as a result of the settlement! *New York Times*, 29.4.2000

BOTTOM LINE: Microsoft's price-setting power remains strong but preliminary evidence suggests that its hegemony is being challenged.

II-C: Microsoft's competitive position.

1. Microsoft has an effective monopoly over 90% of PC operating systems.

2. Although this monopoly is 'sanctioned' by copyright, any behaviour violating the Sherman Act was bound to attract anti-trust attention. This has happened notwithstanding a revision of the emphasis of what constitutes a monopoly. Not yet embodied in law, the definition is moving away from a market share-determined measure towards one driven by the concept of 'contestability'.²⁹⁰ This redefinition reflects the lifecycle concept:

A monopoly that occurs at the beginning of a lifecycle when price-setting power is strong, purchasing power weak and competition almost non-existent may attract regulatory attention. Intervention to prevent abuse of competitive position that the market cannot, of its own, prevent may be necessary.

A monopoly that occurs at the end of a lifecycle when pricing-setting power is weak, purchasing power strong and individual corporate behaviour kept at bay by very low barriers to entry is unlikely to be 'abusive'. There is little profit arising and if it were to increase, this market, through new entrants, would be self-regulating.

BOTTOM LINE: In Round 2, Microsoft's effective monopoly adds to its PLC's amplitude. If this monopoly is maintainable, the duration of the PLC

²⁹⁰ See Comments by Jagdish Bhagwati in [Section 3h - C\)](#)

could be considerable. But the ingenuity of prospective competition aided by the passage of time means that most monopolies are only temporary. Today's market tends to outwit persistent 'control points'. Only if market forces fail might state intervention be necessary, and then only if the company engaged in 'anti-competitive behaviour'. If the market fails to supply one, the fiercest 'competitor' facing a Round 2 monopolist may be the Government.

II-D: Microsoft's cost structure.

1. Software's distinguishing cost feature is that marginal cost falls sharply after the first sale, when significant economies of scale are accessed. Thus it may be difficult to make the *direct* cost structure much more efficient during the PLC, suggesting Windows *direct* costs are not a material conditioning factor.²⁹¹

2. The apportionment of *indirect* costs to the net value-addedness of the PLC is more significant. R&D costs keeping software cutting edge are usually amortised over the useful life of the product upgrade. One item often not reflected – retaining key staff through share options – should be included in a full definition of costs. Microsoft is famous for its generosity here and, although not required by US GAAP until such options are exercised, it has been suggested that were 'in the money' options included in issued share capital, profits per share would not have grown in the past five years!²⁹²

BOTTOM LINE: Low unit costs emphasise the amplitude of the Windows' PLC. But if Microsoft loses its stranglehold on operating systems, high total costs could quickly become material seriously impacting on the full amplitude

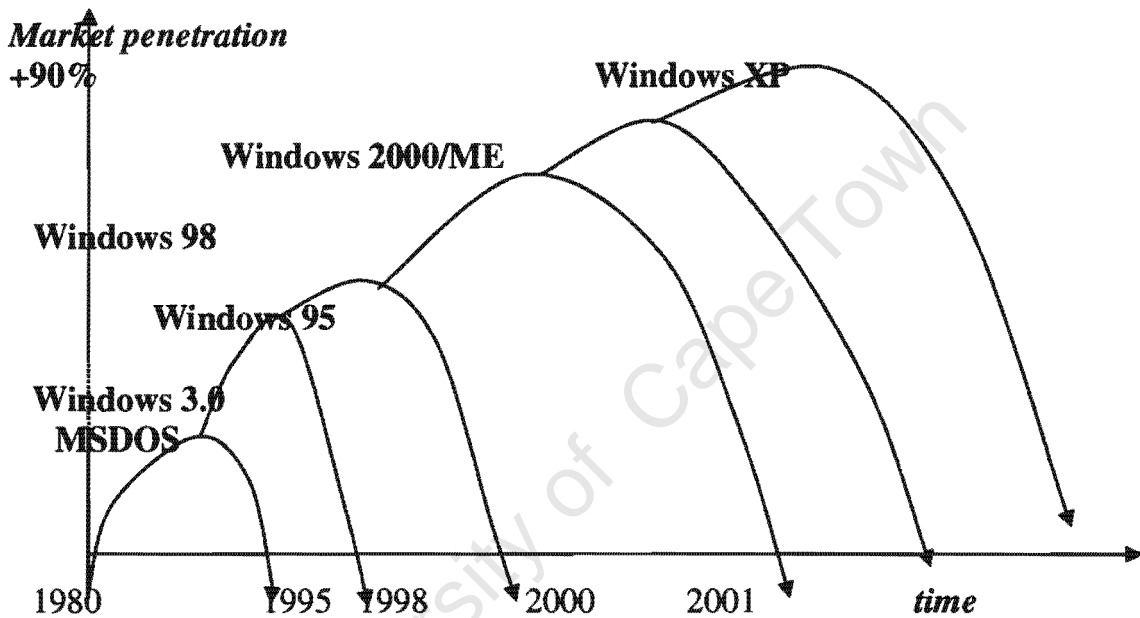
²⁹¹ Windows 2000 retails for \$199 and yet the direct material costs for a box and CD are only a few dollars.

²⁹² Andrew Smithers, Smithers & Co as quoted in *The Economist*, 27.1.2001

of Windows' PLC. This could happen especially if its share price falls and the share option 'golden handcuffs' cease to have value.²⁹³

II-E: Microsoft's product regeneration.

1. Product regeneration – upgrading the Windows family – is central to Microsoft's strategy.



This not only reinforces Microsoft's advantage by increasing path dependency of consumers on its products, but also builds higher entry barriers. No software developers can match Microsoft's current \$4bn per annum²⁹⁴ R&D budget.

2. Microsoft, where improvements are not developed in-house, practices a policy of 'embrace, extend and extinguish'. It either copies or buys rights to third-party software concepts and 'bundles' them into Windows products.²⁹⁵

²⁹³ In the past year, Microsoft has had to both reprice downwards its exercise price on options as well as issue new tranches of options to retain key staff. *BusinessWeek*, 22.1.2001

²⁹⁴ Source: *Merrill Lynch Analyst Report*, 19.1.2001

3. One line of defence Microsoft took against its break-up was that this might undermine innovation. If innovators can have their reward negated by the courts, their kind would arguably be disincentivised.

*Temporary monopoly power is justified if it is the reward for innovation*²⁹⁶.

BOTTOM LINE: *For Microsoft, innovation is adding value to its product line and, if not still expanding the company's margins, preventing them from contracting. That said, the combined effects of the emergence of innovative software that can challenge its core competence, the increasingly marginal benefit derived from each successive Windows upgrade and the rise of alternative centres of gravity where Microsoft does not control the innovation agenda, suggest that each extra dollar invested on regenerating its product line may be yielding less incremental value-added.*

II-F: Microsoft's financial character.

1. While Microsoft is no longer a high growth company, it still enjoys a premium stockmarket rating: 38 times historic price earnings ratio versus a Standard & Poors 500 average of 26²⁹⁷. This implies it is perceived as employing its capital very productively. Accepting its accounting policies as 'fair', this is reflected in the 21% ROE achieved from an ungeared balance sheet. Even though uncertainty about the Company's future has been reduced, Microsoft will probably never exceed its previous best PER multiple, implying

²⁹⁵ Examples include undermining the Netscape web browser with the free add-on, Explorer, or the transmutation of Adobe's typeface technology into Microsoft's TrueType fonts.

²⁹⁶ Krugman P., *New York Times*, 12.7.2000

²⁹⁷ *Yardeni.com*; 8.6.2001

that its Hallelujah Days are over. As CEO Ballmer admits, *'We're becoming a normal company'*.^{298, 299}

2. By virtue of its network strategy, the company may be able to resist gravitational forces for now. But Microsoft will eventually go 'ex-growth': the rise of freeware like Linux and the migration towards the Internet suggest that the writing is on the 'screen' and the Age of Microsoft will pass.

BOTTOM LINE: If previous examples apply – IBM's 1990s fall from grace – today's hero will become tomorrow's fallen angel. But for now a growth premium remains in Microsoft's share price and appears largely deserved.

COMBINED IMPACT OF THE SIX CONDITIONING FACTORS ON ROUND 2 OF THE PRODUCT LIFECYCLE:

Splendid Isolation is usually a company's Jeunesse Dorée. Microsoft uses this Round to combine strong pricing-setting power with dispersed and weak purchasing power. The profitability generated has been applied to fund the research effort necessary to stay ahead. It also enjoys low direct marginal costs, a near-impenetrable market and near-cult status in financial markets. This is the best combination of conditioning factors that a company would face during its product's lifecycle. To be such a monopolist and be allowed to get away with it is a licence to print money.

In Round 2 however, there exist the seeds of a company's inevitable progression to Round 3. Looking at Microsoft, struggling to keep up with

²⁹⁸ *BusinessWeek*, 22.1.2001.

²⁹⁹ Earnings per share compound annual growth rate for the past five years has been 15%; Merrill Lynch forecast a much lower 6.8% in 2001 and 7.3% in 2002; Analyst Report, 19.1.2001.

the move from PCs to the Net and splendidly isolated in Seattle, initially unaware of the power that the competition authorities in Washington might muster, it is not hard to conclude that even the richest company in the world can fall victim to all the forces that influence a market – of which government is *still* one.

It remains to be seen whether Microsoft's ability to define the 'language of computers'³⁰⁰ will die with this generation or be regenerated during the more rigorous market conditions of Round 3: 'Second's Out'.

³⁰⁰ Scott McNealy of Sun Systems noted that only the patent rights on the use of the English language would have been more profitable than Microsoft's patent rights over computer software.

Round 3: 'Second' is Out'

'People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices.'

Adam Smith, *'The Wealth of Nations'*.

De Beers – Is the diamond cartel forever...over?³⁰¹

Background

De Beers recently hired Bain & Co to examine the diamond industry. This led to De Beers overhauling the structure of an industry that has been 'theirs' for a century.

The essential finding was that *'De Beers should no longer be the default custodian, cost be damned'*.³⁰²

*We want to position De Beers to compete more effectively in a more competitive world to place its own diamonds with its clients satisfactorily... We should become the preferred supplier of our clients...*³⁰³

³⁰¹ This section relied heavily upon the De Beers's website and direct communication with their London Office. *A consortium led by Anglo American and the Oppenheimer family successfully taken De Beers private. In terms of the diamond industry's lifecycle, this event has only marginal impact. But it will affect the sixth conditioning factor: the financial character of the company.* I should also note that my master's thesis in economics was on a comparison of how cartels operate in the real world and compared De Beers to OPEC. Among other articles in the financial press referred to are: *Financial Times*: 30.7.2000; 28.12.2000; 9.1.2001; 13.1.2001; 17.1.2001. *The Economist*: 19.12.1998; 3.6.2000; 15.7.2000. *Fleming Martin Analyst's Report*: July 2000; 16.1.2001; *Fleming Martin Market commentaries*: 7.7.2000; 7.7.2000; 17.7.2000; 24.7.2000. *UBS Warburg Analyst's Reports*: 13.7.2000; 31.7.2000; *Ord Minett Analyst's Report*: 19.10.2000 (on BHP). Individual quotations separately cited.

³⁰² *The Economist* 3.6.2000

³⁰³ *De Beers* press release, 20.6.2000

De Beers has long had an effective monopoly in supplying uncut gem diamonds. It secured its market position through a cartel with smaller diamond producers that could not afford to 'go it alone'. De Beers has now opted to move from the Round of 'Splendid Isolation'³⁰⁴ to that of 'Second's Out'. The underlying theme running throughout the new departure is that De Beers is switching from *controlling prices through restricting supply to driving volume, if necessary through being more competitive on pricing*³⁰⁵.

De Beers is dismantling the cartel that has defined its corporate identity. Its control of the gem trade will fall 30% to around 60% with nearly all its throughput coming from company-related mines. As De Beers has run one of the few durable commercial cartels, this event provides unusual insights into what happens when an effective monopolist capitulates to *'unfamiliar market-driven forces'*³⁰⁶.

III-A: The purchasing power of De Beers's customers.

1. De Beers's main customers are diamantaires, dealers in uncut stones, *not* the end consumer. Previously, this group of 'sightholders' were invited to London ten times annually, and offered a pre-selected 'box' of diamonds on a 'take it or leave it' basis. The purchasing power of buyers was heavily circumscribed in that if they declined the selection, they *might* not be re-invited. Given De Beers's control of the uncut trade, buyers usually bought the box offered.

³⁰⁴ And, having visited their Head Office in Kimberley, South Africa, it is not unfair to ask 'Was ever there a company more splendidly isolated than De Beers?'

³⁰⁵ Though for obvious tactical reasons they only talk about driving volume, not varying price.

³⁰⁶ *The Economist*, 3.6.2000

2. Henceforth, 125 sightholders – down from 300 – will be designated core buyers. Membership will be less determined at De Beers's discretion and more on a transparent set of merit-based conditions. Sightholders will indicate stone preferences and De Beers will try to meet their requests. This reflects a marked increase in sightholder purchasing power.
3. Most non-De Beers mines will use Antwerp-based agents to market their output. This will increase sources of uncuts for all diamantaires, making being 'independent' an easier option.
4. De Beers' took the unusual step of consulting widely with its customers whilst restructuring, apparently backing down on a number of key points, thereby creating a more friendly market environment.
5. Amongst end consumers, purchasing power has been increasing as consumers become better informed about diamonds, partly due to De Beers's 4C education programme. A choosier client has greater purchasing power.

There are also additional pressures to which our business has been prone: greater consumer knowledge... price lists that the consumer can refer to... the Internet ... product competition... What we want to do is to compete more aggressively with those other rival products after they are in the market place. And, of course, what is also helping us to drive our new strategy is increased supply competition.³⁰⁷

6. Looking ahead, if the industry promotes volume over price, competition for each extra sale will increase, thereby strengthening the consumer's hand. As

³⁰⁷ Gary Ralfe, CEO of De Beers, 13.7.2000

this works up the supply chain, all diamond suppliers, including De Beers, will need to improve responsiveness to the precise needs of the market.

***BOTTOM LINE:** Historically, purchasers of uncut diamonds have either had to curry De Beers's favour or live on the 'shady' edges of their business. It was a seller's market. Now De Beers is treating clients with more respect, if not as equals. Such 'concessions' may seem small in 'normal' competitive market terms but they constitute a seismic shift in the diamond industry. The weight of purchasing power is beginning to exert a noticeable downward force on the PLC of gem diamonds.*

III-B: De Beers's price-setting power.

1. De Beers will retain enormous price-setting power over uncut diamonds, not being *'about to abandon the market to its own devices'*³⁰⁸. But that power will not be as unfettered as before even if list prices remain non-negotiable. The new strategy's logic – drive demand more than restrict supply – suggests that De Beers will not set prices as aggressively as previously.

2. De Beers experimented with branding via engraving gems with its *'Forevermark'*. Positive market response encouraged retail expansion via a joint venture with LVMH.³⁰⁹ De Beers also encourages sightholders to develop *'own brands'*. If branding succeeds, this will increase industry price-setting power, but with value-addedness born more of a brand than restricted supply.

3. De Beers's brand will access end consumers directly, creating *'channel conflict'* with existing clients. *'Downstream disciplining'* by being part of the

³⁰⁸ *The Economist*, 3.6.2000

³⁰⁹ *Financial Times*, 9.1.2001

pipeline will increase De Beers's price-setting power. Smaller diamantaires may suffer, prompting widespread consolidation (which would be in De Beers's interest) of this 'cottage industry worth \$60bn'³¹⁰.

4. Despite a long-held belief that demand for uncuts was inelastic ('it did not matter what price we sold diamonds at, the demand was only so much and no more'), evidence suggests demand *is* becoming more elastic, even that margin loss due to lower prices can be offset by higher volume sales. This suggests a more subtle pricing strategy going forward, not the traditional sledgehammer approach ('raising prices when we can get away with it, *never* lowering them'). Perhaps De Beers *did* abuse its monopoly pricing power previously in a way that was self-defeating. If so, De Beers is exploring the counterintuitive world of how to *increase* pricing power conceivably even by *lowering* prices: higher margins born of lower costs due to lower unit overheads born of higher volume sales. If uncut prices fall, De Beers will use branding to forestall margin declines.

*Now that only 60% of the world diamond production is bespoke to De Beers, what we are looking at is to make our business look much more responsive at the other end, at demand, how do we manage to create demand for our diamonds... so that we can sell all the diamonds that are coming to us...*³¹¹

BOTTOM LINE: De Beers's price-setting power remains strong, though no longer unquestioned, mainly due to its 60% value share of global mine output. That price-setting power derived from market share is now being reinforced by branding. In lifecycle terms, notwithstanding growing consumer purchasing power, the company may actually expand margins. If

³¹⁰ Lex, *Financial Times*, 16.1.2001

the deadweight loss of financing the industry's diamond stockpile is eliminated, overheads would fall and profits rise.

III-C: De Beers's Competition.

1. De Beers has always faced competitive pressures from outside the cartel, which intensified when Argyle became an independent. Recent Canadian discoveries have added to industry supply.

2. Historically De Beers maintained a second level degree of pricing influence by buying on the Antwerp market. Rival buyers like Tiffany's then created integrated mine-to-jeweller channels.

3. In one sense, De Beers wants to *encourage* competition if it leads to a consolidation of the downstream pipeline.

4. Many businesses have recently realised that the definition of their market has often been drawn too narrowly.³¹² De Beers's 'share of discretionary spending on luxury goods' was small compared to its share of the gem diamond business. Luxury goods manufacturers – a status to which De Beers aspires – operate in a much bigger dollar pool. But competition for that 'share of wallet for luxury goods' seems likely only to intensify.

BOTTOM LINE: Moving to the 'Seconds Out' Round often means, aside from having to face competitors in one's core market, recognising that the

³¹¹ Gary Ralfe, CEO of De Beers, 13.7.2000

³¹² Robert Goizueta, the former CEO of Coca Cola, memorably pointed out that while Coke's share of the carbonated drinks market worldwide was impressive, its 'share of throat' was only 1%!

precise definition of one's market may be 'fraying at the edges'. For De Beers, even in its core market, competition is intensifying.

III-D: De Beers's cost structure.

1. The key question behind De Beers's strategic review was why, despite its effective monopoly, it only earned 7.5% on its capital. The key finding was the cartel's overheads were too high; thus it was decided that *'De Beers should no longer be the default custodian, cost be damned'*³¹³.

2. The stock market 'rewarded' this low capital efficiency with a 3.5 times price earnings ratio on diamond profits, *much lower than even most ordinary commodity companies*. Cartel costs included financing a \$5bn stockpile, equivalent to 1 year's sales.

*The very substantial stocks that De Beers built up in the difficult years through to 1998 ... were excessive and certainly value destroying as far as De Beers ... was concerned...*³¹⁴

De Beers also financed nearly all the industry's marketing costs, an annual commitment of \$200m.

3. By voluntarily ceding control of the cartel, De Beers is no longer *obliged* to 'mop up' stones on the open market to keep the supply/demand equation tight, nor will it to pay commitment fees on billion dollar bank credit lines used to finance inventory. More stock will be carried at mine-heads and so at cost. Its

³¹³ *The Economist*, 3.6.2000

³¹⁴ *Nicky Oppenheimer*, Chairman of De Beers, 13.7.2000

largest mine, Botswana's Jwaneng, carries stock at \$7 a carat; once it is sold to London at \$120 a carat, that becomes its carrying cost.¹¹⁵

4. Besides encouraging *diamantaires* to pursue branding, De Beers's expects 'burden sharing' in marketing. De Beers will not reduce its own 'adspend', but refocus it on the LVMH joint venture, encouraging consumers to buy De Beers-branded jewellery. Returns from this expenditure are expected to rise.

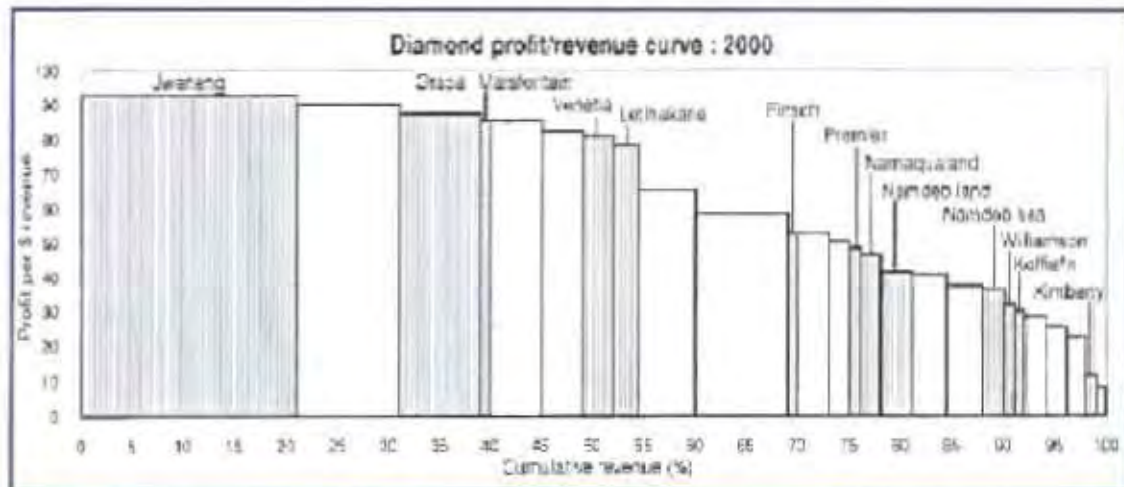
5. Connected to cost reduction efforts will be an attempt to bring order to the 'dysfunctional'¹¹⁶ downstream pipeline; its current inefficiencies cannot but impact negatively on De Beers. Aside from consolidation, De Beers wants to shorten the pipeline so it can respond quickly to market mood.

6. De Beers is re-emphasising low cost production. This can be seen from the diagram below which explains expansion at Jwaneng – output raised from 15m to 20m carats – as well as the minority buy-out Venetia¹¹⁷. (Shaded bars are De Beers's mines.)

¹¹⁵ This is a ratio reminiscent of the \$4 materials cost to \$199 sales price that Microsoft charges for Windows 2000.

¹¹⁶ *The Economist*, 3.7.2000

¹¹⁷ Brenton Saunders, *J P Morgan Chase (formerly Fleming Martin)*



BOTTOMLINE: Unlike the first two Rounds where the issue of costs are secondary, it was the pressure of the market – the capital market – that forced De Beers to realise its cost structure was too high. By abandoning its role as industry ‘protector’, it now aims to make more money from controlling less market share. This moment of truth is not uncommon in the product lifecycle and it is best symbolized by the point where a cartel/monopolist chooses to switch from being a controller of quantity to a setter of price – but not without realising that the price-setting process is (unsettlingly) one of ‘give-and-take’. The clever company has seen this inevitability coming and has already developed a brand to shield it from pure price-based competition. De Beers must do this late. If it is successful, there is much more value-addedness left in the diamond business. Any cost reductions at the ‘Second’s Out’ Round adds value by increasing the PLC’s amplitude whilst laying the groundwork for extending its duration.

III-E: De Beer’s product regeneration strategy.

1. To drive demand, De Beers is branding diamonds and marketing its own stones.

2. De Beers has segmented its market by developing specialist demand curves, like the 'Chris Evert Tennis Bracelet'. In addition, De Beers has spread its main product – the diamond engagement ring – geographically, with great success in Japan and Korea. Yet a family tree of diamond PLCs would be largely contrived. This underlines why branding has become critical to the new De Beers, as it must during the 'Second's Out' Round.

The strategic review really excited us with what branding might do for the diamond jewellery business, bring to it energy – a revitalisation of the whole diamond jewellery sector – create more marketing, increase demand, create product differentiation and generally just grow the sector.³¹⁸

3. De Beers also has an unhidden agenda. The old De Beers was banned from doing business in the US because of its cartel structure. By voluntarily disbanding the cartel, De Beers hopes that – with less than 50% of the gem diamond market – it will be permitted to operate directly in the world's largest market. Alternatively, it will access this market via the LVMH joint venture.

BOTTOMLINE: Though De Beers had long promoted diamonds, it has never branded them – 'a diamond may be forever' but that diamond was never a De Beers's diamond. The new strategy involves branding and retailing with the world's largest luxury goods group, LVMH. It also aims to raise the industry's marketing costs from 1% to 10% of annual sales, more in line with the luxury goods business norm. Given the pressures of competition and rising purchasing power, this is the logical way to hold off emerging margin squeezes. But branding has another, more subtle agenda – to drive

³¹⁸ Gary Ralfe, CEO of De Beers, 13.7.2000

volumes without giving up as much margin as would otherwise have been required to stimulate that increase in demand. To borrow a Keynesian phrase, branding creates 'sticky' prices and 'sticky' prices create more durable PLCs.

III-F: De Beers's financial character.

1. De Beers's financial character was **not** typical of a 'Splendidly Isolated' company. Its share price assumed the cyclical character of the underlying diamond *mining* industry and, combined with its 35% investment in Anglo American, it was regarded as a 'commodity' company. Normally a Round 2 company would have enjoyed a premium rating because of its 'growth' nature.

2. Given that De Beers's ROE was a lowly 7.5%, its low investor rating was deserved. Indeed *the* primary objective of the recent reorganization was to boost returns, a fact that was just starting to be reflected in its share price³¹⁹ before related parties took the company private.

3. De Beers had hoped to rebuild its stockmarket reputation³²⁰ – what did it need to do to earn the ratings enjoyed by luxury goods companies like LVMH or Richemont?

If De Beers decides to embrace branding, it may open entirely new markets for the stodgy company. 'Why limit the De Beers brand to

³¹⁹ As at 15.5.2001, the price was at Rand 321.20 with the high/low of the previous year being Rand 339.80 down to Rand 140.00

³²⁰ *'The strategic plan (was) born of our strategic review last year the purpose of which is to try and grow De Beers's diamond business, to grow its shareholder value.'* De Beers press release 13.7.2000, emphasis added.

diamonds?’ asks Mr Capon (of De Beers), ‘Why not watches, or hand bags?’³²¹

The joint venture announcement with LVMH was the chosen solution.

4. De Beers never aggressively pursued raising equity on the stockmarket.³²² Its ‘Siamese Twin’ relationship with Anglo American³²³ shielded the company from understanding its true cost of capital. As such, it was not so dissimilar from many companies entering the ‘Second’s Out’ Round. Some premium ratings are derived from ‘blind faith’ in continued outperformance more than from actual performance.

BOTTOM LINE: De Beers was unusual: a Round 2 company without having the favourable stockmarket character that went with it. In PLC terms, it was destroying value, notwithstanding margins made on its core business – stones costing \$7 to mine being sold to London for \$120. The costs associated with maintaining the cartel weighed down on the PLC, meaning that returns were lower than cost of capital. By shedding these ‘industry’ responsibilities, De Beers hopes to earn the Round 3 returns that ‘are its due’.

If investors believed De Beers’s branding initiatives improved its value-added margin by lowering its cost of capital, this would have improved its stockmarket standing... so lowering its cost of capital and further raising the PLC’s amplitude. The fact that the Oppenheimers and related parties took the company private before this was fully reflected in stock prices may suggest that these insiders saw value creation coming and wanted it for themselves.

³²¹ *The Economist* 3.6.2000

³²² Or more likely, its controlling family has not wanted to pursue this option.

³²³ Each owned between 32% to 35% in each other, a ‘Siamese Twin’ defence mechanism that has helped maintain the Oppenheimer Family’s control over both companies.

COMBINED IMPACT OF THE SIX CONDITIONING FACTORS ON ROUND 3 OF THE PRODUCT LIFECYCLE:

'Second's Out' asks a boxer's trainers to leave the ring. In De Beers's context, it signifies abandoning the comforts of a cartel for the boxing ring of competition.

'Second's Out' also implies that the market now has more fighters out in that ring. Competition challenges the incumbent's sole right to run the industry.

It also means the audience can choose which fighter to cheer for – consumer purchasing power will grow in influence and be manifested in customers choosing their preferred supplier. This allows heavyweights – perhaps the original incumbent – to show the audience their 'brand' of boxing and, if it is appreciated, earn their loyalty and money.

Played right, the 'purse' in Round 3 contests can be even better than it was in Rounds 1 and 2. De Beers enters Round 3 as the bookie's favourite. But Round 3 is not just about 'winning'. Arguably this is the Round that determines how long this boxing match will last and how large the combined earnings of *all* those who will compete in it will be. It is critical in determining the PLC's full shape, both in terms of amplitude and duration.

Round 4: 'Cracks in the wall'

When the stock of many rich merchants are turned into the same trade, their mutual competition naturally tends to lower its profit.

Adam Smith, 'The Wealth of Nations'

Gillette – Death of a Salesman?³²⁴

Quote 1: (Hawley) shares Zeien's vision of Gillette as a company driven by technological innovation and superior products – exactly the sort of R&D-intensive strategy that produced Sensor in 1990. At that time, Gillette's razor business was threatened by disposables, which commanded more than 50% of the market and were quickly moving it towards commoditization. Gillette countered with a lavish campaign aimed at re-establishing brand loyalty. Then it backed up those ads with a demonstrably superior product – one that segmented the market and commanded a hefty premium from consumers. The result was that Sensor actually reversed the ascent of the disposable razor. That formula – the use of superior technology and savvy advertising to segment markets and prevent commoditization – came to be known informally as 'the Gillette Way'.³²⁵

Quote 2: Gillette spent ten years and \$1 billion developing its new Mach 3 razor; it took a British supermarket only a year ... to produce a reasonable imitation.³²⁶

³²⁴ This section relies heavily on data from the Gillette website and the Financial Press. Among articles referred to are: *Financial Times*: 14.2.2000; 28.2.2000; 24.3.2000; 2.6.2000; 21.7.2000; 22.8.2000; 19.9.2000; 19.10.2000; 3.11.2000; 19.12.2000; 22.1.2001; 26.1.2001. *BusinessWeek*: 12.8.1999; 8.11.1999; 2.10.2000; 16.10.2000; 6.11.2000. *The Economist*: 18.4.1998; 4.12.1999. *Fortune*: 8.11.1999. *Strategy + Business: Q2, 1999: Anatomy of Gillette's latest Global Launch*. *New York Times*: 27.1.2001. *Merrill Lynch Analyst's Report*: 26.1.2001. Individual quotations separately cited.

³²⁵ *Fortune*, 8.11.1999. Hawley has since lost his job after 2 years of flat earnings, 6 profit warnings and a halving share price; his replacement, James Kilts, comes from being CEO at Nabisco.

³²⁶ *The Economist*, 4.12.1999.

*Quote 3: Since the 1960s we have entered into a period of parity manufacturing and parity marketing, meaning that there are almost no areas in which you can have an exclusive advantage anymore.*³²⁷

*Quote 4: As a result of overcapacity, increased competition and scarce talent, branding – the differentiation of ...products – is more important than ever before. But it is increasingly difficult to differentiate products ... tangibly. Technological progress ensures that competitors can copy developments quickly, so product advantages are temporary...Branding alone is not enough to make it in the new era.*³²⁸

Are we witnessing the fall of 'consumer brands' as we know them?

The following table shows the fall in relative value of all branded goods companies amongst the top 200 companies ranked by market capitalisation (2000 vs. 1999) in Institutional Investor's Global 1000

2000 rank	Company	Change in position on 1999 rank
26	Coca Cola	-15 places
51	Proctor & Gamble	-29 places
62	Nestlé	-11 places
84	Philip Morris	-49 places
90	Pepsico	-12 places
113	McDonalds	-34 places
114	Unilever	-51 places
120	L'Oreal	-20 places
153	<i>Gillette</i>	<i>-81 places</i>
155	Anheuser Busch	-31 places
170	Kimberley Clark	-35 places
181	Colgate Palmolive	-29 places
188	Diageo	-69 places

Of branded companies still in the top 200, the average fell 33 places. Gillette, down 81 places, was worst performer.

³²⁷ John Grace, New York-based Executive Director of Interbrand, the branding consultancy. *Financial Times*, 18.2.2000

³²⁸ Sorrell M., Chairman of WPP, the world's largest advertising agency, 2000. *Foreign Policy*, Summer

Company Background³²⁹

Gillette is built on razor blades; other lines include Duracell batteries and toothbrushes.³³⁰

The Gillette Way

Gillette is '*beloved by management consultancies*'³³¹ as the branded goods company that pioneered the strategy for the avoidance of commoditization. Its essence remains continuous product improvement backed by heavy advertising. Gillette also underlines how a product innovating company can combine 'top-of-margin' gains adding real value with 'bottom-of-margin' gains from cost reduction.³³²

IV-A: The purchasing power of safety razor buyers.

1. Buying power directed at razor blades is huge; 60% of adult Western males shave daily. The main qualities looked for are the '3 C's' – closeness, convenience and comfort.

Gillette, the safety razor's inventor, has historically been the supplier of choice for those wanting the closest, most convenient, most comfortable shave.

³²⁹ *BusinessWeek* and *Fortune*, both of 8.11.1999

³³⁰ Other product lines – include stationery (Paper Mate, Parker and Waterman – sold August 2000); the Braun household appliance business (still for sale); and the personal care products centred on the shaving supplies.

³³¹ *The Economist*, 18.4.1999

³³² Audi were able to make a virtue out of a similar strategy in the UK market by using the phrase "*Vorsprung durch technik*" (Advancement through Technology) in their advertising. For many Britons it is still probably the only German phrase they know! No matter, as Audi now has the reputation of being a leader in the Auto industry when it comes to technology

Unusually, the market's centre of gravity has been with Gillette's higher priced options, though Gillette also offers budget options.

Notwithstanding Gillette's premium price, it has 71% of the North American and European blade market – larger than De Beers's share of the gem market.

2. Gillette nearly 'lost it' in the early 1990s when threatened by the disposable razor. Purchasing power was distracted by the '75% of the shave for 25% of the price' claim. Consumers defected en masse on a 'value for money' argument as Gillette's premium price no longer secured its client base. Gillette had two options – cut prices or improve quality. They chose the latter, reasoning that customers would pay up for a better shave.

3. This strategy, like De Beers's diamonds, must be forever. Purchasing power is loyal only up to a point, usually a price point. Gillette's has bought loyalty by spending \$1 billion on Mach 3's R&D.

4. In the US, Gillette must play the 'coupon game' on its budget blades to secure price conscious customers. Gillette knows well the margin-corroding demands of rising purchasing power – 'Every day low prices' – from its battery lines. The danger is that this 'virus' will infect its higher margin blades.

BOTTOM LINE: By the 'Cracks in the Wall' stage, purchasing power is playing off quality against price. Gadflies with budget options may not earn what market leaders do but because some purchasing power wants value for money, corrosive competition will play into consumers' hands by forcing leaders to innovate or reduce prices. Either way consumers win. By Round 4,

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purchasing power is starting to exert significant downward pressure on the PLC's amplitude.

IV-B: Gillette's price-setting power.

1. King Gillette invented safety razor blades (1901). Gillette has re-invented them with the Blue Blade (1932), dispensable (1946), stainless steel (1963) and twin blade, the Trac II (1971). The Atra (1977), Sensor (1990), Excel (1994) and Mach 3 (1998) represent newer generations of this product family – *and regenerations of capital employed in the blade product line.*

Each reinvention refreshed Gillette's price-setting power. The mark up from Atra to Sensor Excel was 60%; from Excel to Mach 3, 35%. But is the Mach 3 so efficient that the next upgrade can only – like Windows XP – be a marginal improvement? If so, there *is* a diminishing marginal utility to innovation improving the same basic product. As such, return on each R&D dollar invested in each new generation can fall as the PLC ages.

2. By Round 4, price-setting power born of superior quality tends to be short-lived as innovations are more quickly adopted as industry standard. Barriers to entry are lower where barriers to imitation are lower. The UK's Asda/Walmart took a year and \$3m to develop an imitation blade that did not violate the 35 patents surrounding Gillette's Mach 3.³³³

3. With choosier customers – besides, there *is* more choice – price sensitivity rises as a percentage of what determines the purchase decision. Companies cannot price as previously and have the same certainty that a given price will

³³³ *The Economist*, 12.2.1999

yield a certain volume of demand. Price points become more critical as a product ages, constraining pricing-setting power.

Gillette's strategy 'underprices' the razor handle and then exacts compensating 'rent' from annuity-like blade repurchases. Customers – especially the marginal 'floating voters' – often chafe at 'tied purchases'. Gillette compensates customers – raising their purchasing power – by improving individual blade life: from Atra to Mach 3, average blade usage per year fell from 32 to 25.

4. Gillette's products may be expensive relative to the competition, but as a percentage of the targeted shaver's budget, they are often 'non-material' – 2 weeks shaving at \$1.60 a Mach 3 blade means 11 cents a shave. Gillette exploits low income elasticity of demand for low priced products.

Yet the marginal convert – he who must be won over every year to keep volumes, profits, share prices and management share options rising – is often more price sensitive.

What must a company with a 71% market share do to capture the next 1%? One option is to cut prices – but a 1% price cut on margins means that profits earned from the seventy-second percentile are unlikely to compensate for the profits foregone on the 71% already secured. Gillette can cut prices in lower valued lines to win converts to their 'shaving system', thereafter seeking to upgrade that convert. But Gillette risks potential converts saying 'so what?' to a 'mere' 1% cut in prices. Thus a company can get stuck on a profits plateau, be seen as ex-growth, see its share price fall, all leading to demands for new management. This exactly describes Gillette's fate over the past two years.

BOTTOM LINE: By Round 4, management's price-setting flexibility is constrained. Innovation buys time, but competition emulates each new improvement more quickly. Between copycat competition and choosier customers, even kings like Gillette are no longer king makers in price.

Gillette's Duracell, the leading premium price battery, has seen its market share eroded by 'cheap Asian imports' and competition from Rayovac and Energiser. Will Mach 3's fate be similar? In South East Asia, it already is – low cost, Chinese-made fake Mach 3 blades swamp that market.

By Round 4, for price-setting power still to support PLC amplitude, it must be matched by the market's willingness to pay up for a superior product. Otherwise, forces marshalled by consumer purchasing power, aided and abetted by competition's corroding influence, will undermine it.

IV-C: The competition facing Gillette

I. Notwithstanding a 71% market share, Gillette faces competition not just from Phillips and Remington (the electric option), Wilkinson Sword and Schick (blades) or Bic (disposables), but from two quarters difficult to face down.

The first is mass retailers like the UK's Asda/Walmart. Because they offer '90% equivalent quality at 50% of the price', they are hard to compete with on quality, impossible to compete with on price. Yet by winning new shavers' custom or eroding Gillette's market share, Gillette experiences lacklustre volume growth. And 'Who wants to be around when growth decelerates?'³³⁴

³³⁴ A retail analyst commenting on the recent slowdown at The Gap; *Business Week*, 24.4.2000

2. Gillette's most formidable competitor is ... itself! With only 29% of the market available, raising prices is only really achieved by getting existing custom to trade up. Except in the wake of a new product launch like Mach 3, this is risky, lest the consumer switches outside the Gillette stable altogether.

3. By Round 4, competition can be bought out, using such defensive justifications such as '*consolidating market share*', '*rationalising the industry's cost base*' and the ubiquitous '*exploiting synergies*'. For Gillette, this is not an option, having few rivals with whom it could derive 'synergies'. Both US and EU anti-trust authorities would almost certainly veto the idea. Gillette bought Braun's electric shaver business in 1965 but this sector commoditized; Gillette is now selling Braun. Gillette may itself be a takeover target; Colgate Palmolive is the favoured acquirer.

BOTTOMLINE: For a branded company like Gillette, Round 4 means staying ahead of the competition by innovating and, as discussed next, cutting costs. Industry consolidation is possible only where allowed.

IV-D: Gillette's cost structure.

1. Costs are arguably *the* critical determinant of corporate success in the PLC's second half – by Round 5, they may be the only determinant. Gillette can 'see this coming' given its Duracell experience. Stockmarket unease with Gillette's 'lack-of-growth' record has forced additional cost reductions.

2. Gillette has long adopted a two-pronged attack towards maintaining margins. Aside from 'innovate, innovate, innovate', since 1990 it has aimed to reduce unit costs 4% annually by improving production and distribution.

3. Responding to investor unease in 1999, Gillette implemented radical cost-cutting. Saving \$200m annually, it cut its workforce 11% and closed down 14 factories and 12 distribution centres.³³⁵ In 2000, *another* restructuring reduced head count by 8%, closed 8 factories and 13 distribution centres and outsourced low-volume products, reducing annual costs by \$125m.³³⁶

4. As with De Beers, inventory control has long plagued Gillette. Rising 43% between 1996 and 1999, retail inventories also became 'overstuffed'³³⁷.

This usually arises from pushing output towards maximum capacity, achieving optimal marginal production costs...but then being unable to sell the extra output. That Gillette's fastest volume growth markets (sales are 70% non-US) suffered from the 1998 Asian crisis and the Euro's 2000 weakness did not help.

Inventory issues often surface during Round 4. The marketing department cannot sell higher volumes without giving away on price. Alternatively another crack shows: surplus capacity. This can be 'solved' by closing factories (Gillette's preferred option) or giving way on price, the latter sometimes promoted by 'buy four, get one free' offers.

BOTTOMLINE: No modern day corporation is cavalier with costs and just as brand building tends to begin in earnest by Round 2 (even Round 1), so cost control will feature heavily by Round 3 (perhaps Round 2). By Round 4, it definitely moves centre stage.

³³⁵ *Fortune*, 8.11.1999

³³⁶ www.gillette.com

³³⁷ *Financial Times*, 28.2.2000

Increasing product prices is now rarely an option. But management can influence costs. Modern Gillette has long been cost conscious. If it cannot paper over the cracks now appearing in its product line, cost control will occupy virtually all its time.

Being the lowest cost producer helps defend the PLC's amplitude. Staying low cost producer helps extend the PLC's remaining duration, an extension that can (as it did with GE) allow the company to reinvent its products and rejoin the lifecycle at Rounds 1 or 2 again.

IV-E: Gillette's product regeneration strategy

1. The first five Rounds all emphasise product regeneration, yet – for survival purposes – Round 4 is arguably more critical than any other in the PLC. Recognising this, Gillette is the leading proponent of innovating to avoid commoditization spending 2.2% of sales on R&D, twice the average of comparable companies.

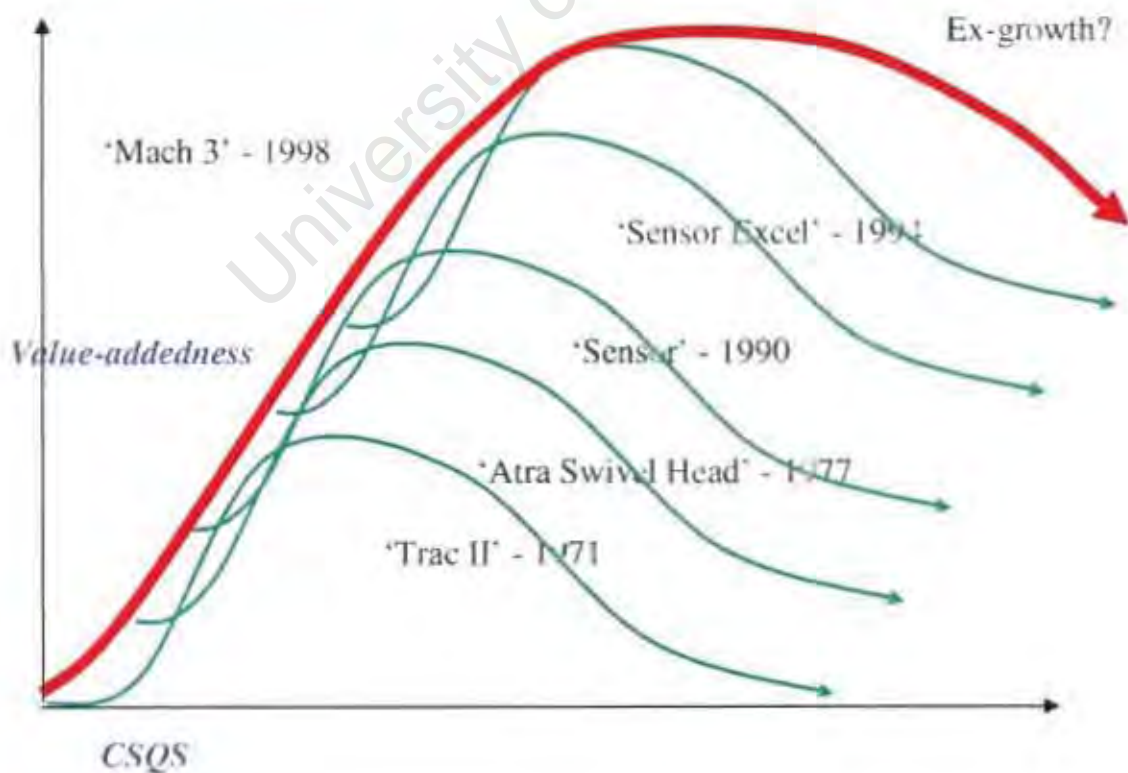
2. Gillette cannibalises existing lifecycles – Sensor Excel would have been profitable for perhaps five years before commoditising. Yet Gillette absorbed its 1990 lesson – do not defer the next model or you may not be financially powerful enough to repel cut-priced competition.

3. Since 1990, Gillette has not simply regenerated the product but re-engineered the production process, spending more on the latter than on R&D. Mach 3's blade production line was three times faster than Sensor Excel's.

4. Mach 3's successor was on the drawing board *before Mach 3 was released!* The company may introduce an intergenerational Mach 3 upgrade, as Sensor Excel was to Sensor.

5. Is Gillette reaching the limits of 'the best a man can get', a terminal velocity equivalent for innovation: 'the best the product can get'? To reinvent itself, Gillette may have to reinvent shaving with a 'disruptive technology' such as a beard-dissolving gel, thereby creating a **completely** new lifecycle.

BOTTOMLINE: *Is each blade regeneration an enhancement within an 'overarching' blade lifecycle?*



Round 4 is where players can realise there is little improvement left in their product that would add amplitude to the overarching lifecycle. Any R&D spend reduction (arguably more necessary if profit margins that must finance R&D are being squeezed) would undermine product advancement thus creating another crack in Round 4's wall.

Since 1990, Gillette has reinvented blades 'early'. Occasionally, it used delaying tactics: Sensor Excel papered over the cracks in Sensor's 'wall' to buy time before Mach 3 was launched.

Round 4 regeneration is not just about raising amplitude but gaining ALTITUDE. Once ascent ends, the higher that altitude, the longer the 'glide-path' down to commoditization.

IV-F: Gillette's financial character.

I. Gillette – before discovering the Gillette Way – was financially 'old aged', a 1986 market capitalization of just \$3bn and four take-overs repelled in the 1980s. 1990's Sensor launch rejuvenated Gillette. By 1998, market capitalization was \$66 billion, up 20 times in 12 years. Until 1999's malaise set in, Gillette attracted a 42 forward price/earnings ratio.

Gillette's 1999 results tell the following divisional story:

Blades: average 5-year sales growth +6.1%, but flat over past two years

Toiletries: average 5-year sales growth -1.8%, and falling over past two years

Stationery (now sold): average 5-year sales growth +1.6%, but falling over past two years

Braun: average 5-year sales growth +3.3%, but falling over past three years

Oral B brushes: average 5-year growth +8.9%, but falling over past year

Duracell Batteries: average 5-year growth +7.9%, (but first six months of 2000 saw a 3% fall in sales and a 25% fall in profits).

Among remedial actions taken are:

- > Selling slower growing businesses – stationery division (Papermate, Parker, Waterman); White Rain hair products
- > Developing the Sensor Excel brand, Venus for Women

2. Today's Gillette is a fallen angel. Market capitalization has halved; the forward price/earnings ratio is 29 vs. the market's 26. *'Its status as a growth stock is in jeopardy'*³³⁸. Investors suspect Gillette's products have crested the top of their PLC. Is Gillette becoming an ex-growth stock?

The new CEO, Jim Kilts, identified Gillette's 'Circle of Doom' thus:

Advertising spending decreased;

Core franchises weakened;

Sales promotion increased;

Trade loading ensued;

Operating expenses increased;

Profit margins declined;

Capital expenditures exceeded group average;

Working capital discipline eroded;

ROIC declined; and

*Sales and profits were flat since 1997.*³³⁹

³³⁸ *BusinessWeek*, 12.10.1999

³³⁹ As reported in a *J P Morgan* research note dated 14.6.2001

Gillette must now show the stock market its 'aging lines' are temporary. Given recent examples of near commoditization by famous brand food companies like Heinz and Quaker Oats, markets remain sceptical. J P Morgan's analyst recently noted: *'We think it will take at least several quarters before the company proves that it can return to consistent top- and bottom-line growth.'*

3. Going ex-growth implies a company becomes a 'prisoner' of the economic cycle. Its 'beta' volatility rises increasing its cost of capital, making adding value more difficult. As the squeeze on value-added margins asserts itself strongly from above, a rising cost of capital pinches margin from below.

4. Gillette's challenges are symptomatic of those faced by the branded goods – to repeat Sir Martin Sorrel, *'the brand is not enough'*. As the table below shows, only Coca Cola and Colgate Palmolive trade at a US premium with L'Oreal beating the French average.

Company	P/E	Premium/discount to market average ¹⁴⁰
Coca Cola	54	74% premium to 31x average (US)
Procter & Gamble	23	26% discount to 31 x average (US)
Nestlé	27	4% discount to 28 x average (Switzerland)
Philip Morris	8	74% discount to 31 x average (US)
Pepsico	27	13% discount to 31 x average (US)
McDonalds	24	23% discount to 31 x average (US)
Unilever	20	39% (19%) discount to 33 x (21x) average (UK/Netherlands respectively)
L'Oreal	60	40% premium to 43 x average (France)
Gillette	29	26% discount to 31 x average (US)
Anheuser Busch	25	19% discount to 31 x average (US)
Kimberley Clark	19	39% discount to 31 x average (US)
Colgate Palmolive	34	10% premium to 31 x average (US)
Diageo	16	24% discount to 21 x average (UK)

¹⁴⁰ All figures from *BusinessWeek*, 10.7.2000

BOTTOMLINE: When investors hear 'cost control' more than 'innovation', they often downgrade the company from 'growth' to 'value' status. Unless Gillette convinces doubters that its blade business has not gone ex-growth, its 'value' rating will stick.

Forward-looking capital markets reflect perceptions of how efficiently a company will use capital. Share prices predict 'ex-growth' status ahead of realisation. Gillette's recent divisional performance – even in blades – suggests the market got it right.

Round 4's financial character is reflected in amplitude. By downgrading a company to 'value status' predicting a downturn in its PLC's amplitude, the market then helps precipitate that downturn by raising its cost of capital.

COMBINED IMPACT OF THE SIX CONDITIONING FACTORS ON ROUND 4 OF THE PRODUCT LIFECYCLE:

Round 4 is the PLC's moment of truth. Can a product further expand margins or will cracks in its defensive wall widen signalling descent to commoditization?

Round 4 is where the forces of supply (including cost cutting and innovation) are involved in the fiercest Round yet in the siege of the producers' citadel by massing consumer forces (aided by the Trojan Horses of competition operating from inside the city walls). The offensive tide will almost certainly seize pricing power's initiative during this Round, though the siege can be – as with Troy – long and hard-fought. The usual outcome is that the amplitude of the PLC starts to contract with

defensive, rearguard actions determining the duration of the PLC's value-creating tail.

The siege need not turn into capitulation; producer forces retain powerful weapons to repel consumer catapults. As Round 5 will show, the most effective tactic involves turning the Trojan Horses of competition into their own cavalry through mergers and acquisitions. They can also make tactical retreats by using share buybacks to consolidate their capital forces.

Notwithstanding these tactics, cracks in the wall may still widen requiring marshalling of a wide range of forces to prevent them becoming a full-scale breach in supply's defences.

University of Cape Town

Round 5: 'The Slippery Slope'

The diminution of profit is a natural effect of prosperity.

Adam Smith, 'The Wealth of Nations'

Ford Motor Company – Oil Road?³⁴¹

Even before 9/11 and Jac Nasser's resignation as CEO³⁴², there was evidence of deep-seated problems at Ford. These included:

- a) ageing products with a thin development pipeline
- b) low workforce morale constantly facing 'right-sizing'
- c) falling R&D spend and delayed launch dates
- d) high-level management disagreement over strategic direction
- e) pre-extraordinary losses in Q2 2001, declining cash reserves and the first dividend cut in ten years, all weakening the share price
- f) chronic inability to profit from European or Latin American operations
- g) brain drain at the senior levels (the CFO; Head of Labour Relations)
- h) 'stubborn' cost base – per car costs up \$1000 in recent years
- i) dealer networks upset by Ford's encroachment on their margins³⁴³

³⁴¹ This section relies heavily on data from the Ford Motor Company website and the Financial Press; coverage of the auto industry is especially extensive so the following list is not exhaustive. Among main articles on Ford referred to are: *Financial Times: AutoSurvey* published in February, June, September, December, 2000; February, October 2001; individual articles dated 24.9.1999; 19.2.2000; 13.7.2000; 19.7.2000; 20.7.2000; 28.7.2000; 31.7.2000; 2.8.2000; 6.9.2000; 15.9.2000; 18.9.2000; 22.9.2000; 2.10.2000; 4.10.2000; 5.10.2000; 6.10.2000; 16.10.2000; 17.10.2000; 18.10.2000; 1.12.2000; 15.12.2000; 17.12.2000; 18.12.2000; 21.12.2000; 22.12.2000; 28.12.2000; 3.1.2001; 8.1.2001; 11.1.2001; 18.1.2001; 31.12.2001. *BusinessWeek*: 11.10.1999; 25.10.1999; 28.2.2000; 6.3.2000; 3.4.2000; 17.4.2000; 29.5.2000; 19.6.2000; 9.10.2000; 16.10.2000; 23.10.2000; 20.11.2000; 4.12.2000; 8.1.2001; 15.1.2001; 5.3.2001. *The Economist*: 30.1.1999; 7.8.1999; 31.12.1999; 8.1.2000; 12.2.2000; 26.2.2000; 1.4.2000; 29.4.2000; 29.7.2000; 5.8.2000; 23.9.2000; 7.10.2000; 4.11.2000; 13.1.2001. World in 2000. *Fortune*: 15.5.2000; 16.10.2000; 18.12.2000. *Salomon Smith Barney Analyst's Report*: 10.1.2000; 26.1.2000; 31.1.2000; 28.6.2000. *Merrill Lynch Analyst's Report*: 19.1.2001. Individual quotations separately cited.

³⁴² 30.10.2001

³⁴³ *New York Times* and *Financial Times* of 30.1.2001; *Fortune*, 29.10.2001

These issues epitomise the precarious nature of a Round 5 company operating on the cusp of commoditization.

Industry Background

The following quotation³⁴⁴, annotated through immediately following footnotes, captures the current character of the automobile's PLC.

Ford and GM in Europe are already enduring weaker profitability¹ from their manufacturing operations². And a number of outside pressures could further dent the margins.

Arguably the largest threat is posed by the European Commission³. At the end of this year, Brussels is expected to begin a two-year review of the block exemption⁴, the system that allows carmakers to avoid normal competition law by selling and distributing cars only through captive dealers.

If ...the Commission abandons the system it could signal a revolution in car retailing. Manufacturers would lose much of their control of the European market place and prices in high volume countries such as Germany and the UK would fall⁵.

As prices fall, weaker manufacturers could become vulnerable to take over – prompting another wave of consolidation in the industry.⁶

Most carmakers will find it difficult to compensate for this by increasing prices in the US, where incentives and price competition are already intense. Volumes in Asian and Latin American markets are unlikely to contribute significantly in the near term.⁷

³⁴⁴ Tim Burt, Auto Correspondent, *Financial Times*, 24.9.1999

The malaise could coincide with rising costs as manufacturers meet new emissions targets and invest heavily in developing new fuel technology. New legislation on the recycling of cars and trucks could further increase their operating expenses.¹

The pressures imposed by those costs and pricing pressures could lead to a more marked polarisation of the industry. Those manufacturers unable to finance new technological developments or withstand price cuts could become take-over targets.²

They may be snapped up by cash-rich¹⁰ manufacturers looking to offset a shrinking market by extracting savings and increased volumes from new subsidiaries. 'Companies that are relatively cash-rich and buoyed by high stock prices are looking for acquisitions to deliver cost reduction that keeps pace with price cuts,'¹² says Andrew Blair-Smith, Head of Automotive Research at Commerzbank in Frankfurt.

Such large companies can also afford to expand downstream, buying up dealerships and increasing their presence in areas such as credit and servicing to bolster margins.¹³

'The only way it to make money is to offer product and service differentiation that customers are willing to pay for,'¹⁴ according to John Lawson of Salomon Smith Barney in London.

¹ The lifecycle is declining.

² There is little pricing power left in 'making things'.

³ Pricing power is squeezed between a tighter regulatory environment and rising consumer purchasing power.

⁴ A European legal barrier to entry is falling...

⁵ ...and the cracked walls of pricing power come tumbling down.

⁶ Consolidation – 'middle age spread' – is the natural response to thinning margins.

⁷ Industry cannot offset one market's fall with another's rise.

⁸ Regulators are raising 'operating overheads'.

⁹ Competition is sorting out the weak – who cannot afford R&D for the next round – from the relatively 'strong'.

¹⁰ 'Cash richness' reflects returns from yesterday's investments not being redeployed to finance tomorrow's growth. Why? Because ROCE is declining.

¹¹ Growth is more by acquisition than organic.

¹² Hopefully falling costs match falling prices, protecting margins.

¹³ Vertical Integration allows the supplier to capture more of the value-added chain.

¹⁴ The 'service' economy!

V-A: The purchasing power of car buyers.

1. Unlike a potential software buyer, a potential 'transport' buyer is spoiled for choice. Microsoft's Windows has low price elasticity of substitution. 'Transport' options have high price elasticity of substitution: bicycle vs. scooter vs. motorbike; or if buying a car, a multitude of makes. Bill Ford³⁴⁵ even forecasts:

*The day will come when the notion of car ownership becomes antiquated. If you live in a city, you don't need to own a car.*³⁴⁶

There is the 'negative' option – with 74% of US sales replacement³⁴⁷, keep the existing car longer (US average age of a car rose 6.5 to 8.5 years, 1975 to 2000³⁴⁸). Or buy second hand. This suggests strong purchasing power and correspondingly weak price-setting power.

2. Competing channels erode price-setting power. British buyers of a new VW Golf can source it as follows:

	Price for a VW Golf ³⁴⁹
Britain	\$13,040
Finland	\$8,290
France	\$10,510
Germany	\$11,040
Italy	\$10,690

Internet 'bots' search all these sources. Ford's European Internet sales even attract a 5% discount³⁵⁰. Though only 1% of sales are web-based, 60% of

³⁴⁵ Ford's Chairman and CEO

³⁴⁶ *Financial Times*, 5.10.2000

³⁴⁷ *SSB*, 31.7.2000

³⁴⁸ *SSB*, 31.7.2000

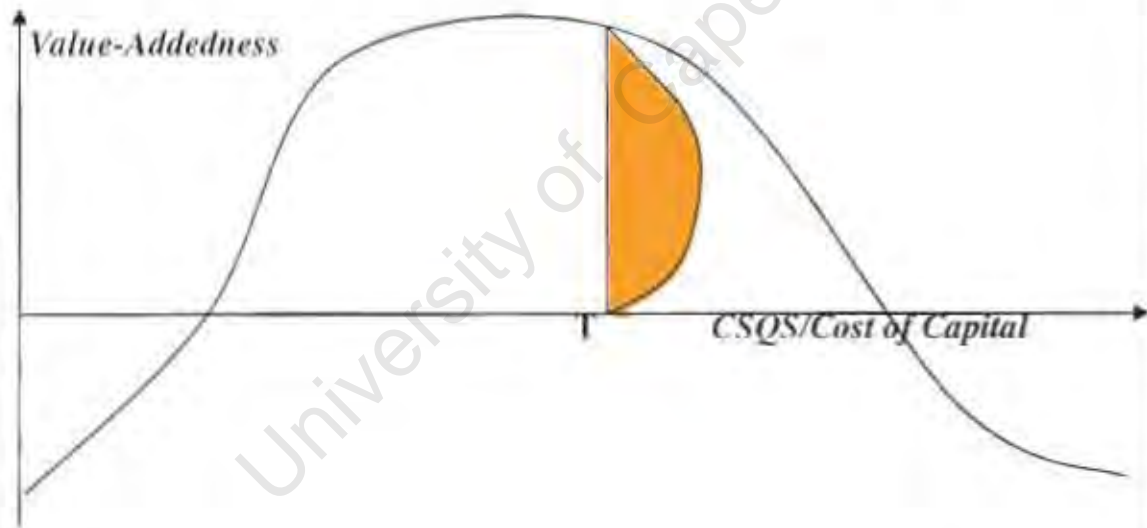
³⁴⁹ Price excludes taxes. *BusinessWeek*, 19.6.2000

purchasers do online style and price searches³⁵¹. This may aggravate channel conflict, but it allows transparent price discovery and drives down prices.

3. Agents usually offer inducements to clinch a sale – extended warranties, cash backs, low repayment interest or 3-year leases with buybacks – or ‘load’ cars with features, from airbags to air-conditioning.³⁵² Such behaviour underlines rising consumer purchasing power.

An aside on credit sales

In terms of the PLC, what financed purchases do is bring forward sales that would most likely have happened later. This can be represented thus:



At time T, credit sales are represented by the orange shaded area. Some of the value-added would be in the interest earned from the, say, hire purchase contract for a Ford Lincoln. One concern – very current in the US auto sector at

³⁵⁰ *Financial Times*, 6.10.2000

³⁵¹ *J. D. Power Associates*

³⁵² This practice may yet backfire on the industry as second hand car prices have fallen faster than estimated. The Big Three could lose \$4bn between them on this practice; for instance Ford is estimated to be facing an average loss of \$1,400 on every Explorer in this programme. *BusinessWeek*, 16.10.2000

present – is that 0% financing deals cannibalise future sales; if a PLC is close to crossing the Cost of Capital line, such cannibalisation is of particular concern.

4. Ford's response to rising purchasing power was to develop niches where consumers were more price insensitive. In 2000, pick-up trucks and SUVs were Ford's biggest earners; each F-150 earned \$10,000 profit.³⁵³ Ford also acquired rivals whose marques was less price sensitive than the typical Ford saloon. Its Premier Automotive Group has added Jaguar, Volvo, Aston Martin and Land Rover.

5. Whilst helping achieve Henry Ford's objective of 'building a car for the great masses', the Ford Explorer recall shows the fallout of safety product faults. Consumers 'rights' in developed countries make such mistakes costly (for Ford, \$3bn); such 'rights' are part of today's purchasing power.

BOTTOMLINE: Auto assemblers are all but price takers. Some 'price stickiness' exists in certain niches, like SUVs, but even their slope is slippery – in Europe, prices are falling 2.5% a year³⁵⁴. Auto assemblers try to offset rising purchasing power by staying ahead through innovation, keeping brands distinct and segmenting markets. Such tactics constitute rearguard actions: consumers win virtually every skirmish. By Round 5, purchasing power weighs heavily on the PLC's amplitude.

V-B: Ford's price-setting power.

1. By Round 5, price-setting power is almost the 'clean' inverse of purchasing power, 'clean' because, with sufficiently good knowledge, markets

³⁵³ *The Economist*, 7.8.1999

³⁵⁴ *The Economist*, *World in 2000*

become transparent. Internet age consumers are increasingly price-aware; *tâtonnement* today involves less groping in the dark and more seeing in the light. Market segmentation attempts are quickly exposed.

*Overcapacity in Europe is estimated at more than 4 million vehicles for 1999. The combination of the Internet and the adoption of the Euro should also lead to greater pricing transparency – hardly a great positive for margins. Such is the competition that consumers rather than shareholders probably will get most of the benefit from cost savings.*³⁵⁵

In size-of-purchase terms, cars normally rank second only to houses and are rarely impulse-based. Purchase decisions often take months. (How long does it take to decide to buy Windows?) The agent must ensure that the sale package is priced right, often the only value added service for a product that has otherwise commoditized.

2. *'Profit margins are shrinking'*³⁵⁶. Ford's margins fell from 4.8% to 3.2% in the year to Q1, 2001, mainly due to incentives: new buyers on average received cash backs of \$2,300.³⁵⁷

Even though (or because!) Europe has *'some of the most demanding consumers on the planet'*³⁵⁸, Ford's 1999 \$30bn European turnover yielded \$28m profit! Overcapacity of 40% is the root of poor performance – Europe's installed capacity is 2.25m against demand of 1.7m units.³⁵⁹ Worldwide, capacity utilization is 69% yet car companies only make 'true' profits at 80%.³⁶⁰ **Most**

³⁵⁵ *The Financial Times*, 19.2.2000

³⁵⁶ *The Economist*, 8.1.2000

³⁵⁷ *BusinessWeek*, 25.6.2001

³⁵⁸ *BusinessWeek*, 29.5.2000

³⁵⁹ *Financial Times*, 19.2.2000

³⁶⁰ *The Economist*, 8.1.2000

car companies are value destroyers and so Round 6 in character. But Ford and GM's 'true' 2000 profits offset these losses. (In 2001, the global auto industry was loss making.)

This is classic Round 5 – significant surplus capacity with paper-thin margins. But higher capacity utilisation would lead to prices sagging more than marginal costs fell: a net margin fall of 0.1% in Europe would send Ford into losses. **Not** being able to cut prices because it would deepen losses also limits a company's pricing-setting power – the practical consequence of the micro-level Marshall-Lerner criterion when 'devaluation' does not increase profits. Such an industry returns to Round 2 where the critical decisions are based on *setting output more than price*.

Between Rounds 2 and 5, it usually pays a company to sell an extra unit if this increases overall profits, even if it means conceding margin: scale economies ensure total profits rise with the extra sale. (And if you don't make that sale, someone else will.) Before this point in Round 2 and after some point late in Round 5, the 'reduce quantity' option may actually be more profitable! Either the monopolist is hoarding output so as to maximise profit, or – as with Ford Europe – output is reduced to preserve and perhaps increase what profit remains!

This ties back to Section 3h A-B's *Zugzwang* observation. The key table is:



Even if individual companies might disagree, the sensible *industry* option would be to reduce capacity, common practice following Round 5 mergers and acquisitions. Indeed the post-acquisition euphemism ‘taking out costs’ is a politically sanitised way of ‘taking out capacity’. Ford buys Land Rover and closes its Dagenham plant losing 900 jobs³⁶¹

The big question facing Ford is:

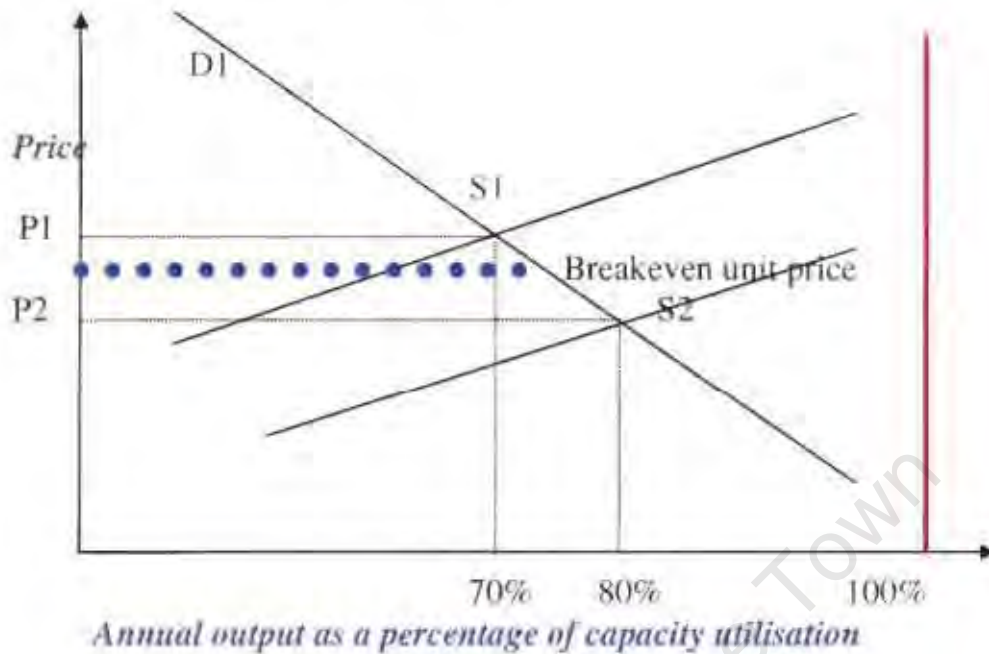
*Should Ford shrink to become stronger... or plot a new strategy for growth?*³⁶²

An interesting new dynamic may operate during Round 5 – market share may not only become unimportant, *it may become disadvantageous! What use is 100% market share if it means not making a profit?*

³⁶¹ *Financial Times*, 13.7.2000

³⁶² *BusinessWeek*, 1.11.2001

Consider the following diagram.



At 70% capacity utilization, the industry faces price P1, making it 'truly' profitable. Assume 7 industry players each with 10% market share: 6 are running at 75% capacity; the 7th, A, is running at 50% capacity (alone accounting for 10% of the spare 30% capacity facing the industry as a whole; the others collectively accounting for 20%.) Assume A increases his output to 100% capacity raising his market share to 25%; industry utilization rises from 70% to 80%. S1 moves to S2 but the extra output is only sold if P1 falls to P2. At P2, nobody – including the boat rocker – makes a 'true' profit. 25% market share for the 'boat rocker' is a pyrrhic victory. A far better 'solution' would be for 'boat rocker' to buy another player thereby increasing own market share to 28.6% (20/70). In the deal's aftermath, A reduces the capacity of the merged company in the name of rationalisation. Even before this, capacity utilisation of 'boat rocker enlarged' rises from 50% (10/20) to 60,6% (20/33,33), possibly reducing his marginal costs.)

3. Ending Europe's 'block exemption' will undermine pricing power³⁶³. After 2002, price differentiation by market will be illegal. Auto manufacturers call Britain 'Treasure Island' as the UK consumer must pay much more (89% for a Honda Civic³⁶⁴) than her Continental colleague.

*If British prices ... were to fall in line with Continental levels, that ... would wipe out \$150m earnings of PSA Peugeot Citroen, \$163m from Volkswagen and \$284m from Ford... That's 10 times more than Ford made in Europe (in 1999).*³⁶⁵

4. European and US authorities are tightening emission controls, adding costs that cannot always be passed on to the consumer. Adding new safety features can also add costs whilst impinging on margin.

5. Mass customisation may recoup some pricing power. Ford, which invented mass production and whose founder said 'any color so long as it's black', is 're-inventing the wheel'. By emphasising the 'division of customer', it hopes tailor-made margins will be more durable.

6. Ford has sold off low margin (commoditized?) Visteon³⁶⁶ and pursued a 'product life-management' strategy³⁶⁷ by diversifying into higher margin areas (consumer finance, Hertz car rental.) Estimating that a \$20,000 vehicle generates revenue of \$62,000 over its life, Ford sees that revenue as opportunity.

³⁶³ Prices have been falling by an average of 2.5% a year with Ford having to guarantee British buyers a refund if the list price falls after a purchase. *The Economist, World in 2000*

³⁶⁴ *BusinessWeek*, 19.6.2000

³⁶⁵ *BusinessWeek*, 19.6.2000

³⁶⁶ Formerly its car parts division

³⁶⁷ *Financial Times*, 28.2.2001; this may change again in the post-Nasser era

Whereas carmakers are lucky to scrape operating margins of more than 5% from actually making cars, other businesses such as leasing, renting, insurance, finance and car repair can all achieve margins of 10% to 15%.³⁶⁸

7. In 2000, Ford was the most profitable car company. Overseas losses were offset by \$5bn earned in North America³⁶⁹. Ford's fears – now being realised – are that its SUV niche will be attacked by imports³⁷⁰. Average unit profit margins of \$1894 per unit were strong enticements to profit-starved foreign competition³⁷¹. Such competition will undermine price-setting power.

***BOTTOMLINE:** Round 5 price-setting power is anaemic. The industry may still be profitable, but this is largely dependent on the economic cycle. Only when capacity utilisation rises near the top of that cycle does price-setting power improve. In the US, cash backs are structured so as to 'smooth' earnings using higher returns of cyclical peaks to subsidise lower levels in the troughs. Such tactics only make the slope less slippery.*

Ideally industry spare capacity should be reduced removing temptation to make that 'sale-too-far', thereby forestalling price erosion and margin contraction.

With cost and capital reductions, diversification into higher margin areas whilst shedding lower margin businesses and industry consolidation, the PLC's amplitude can be defended. Gillette's classic defence of 'reinventing price-setting power through product innovation' remains but by Round 5 such advances are costly and advantages short-lived.

³⁶⁸ *The Economist*, 23.7.1999

³⁶⁹ *BusinessWeek*, 11.10.1999

³⁷⁰ *BusinessWeek*, 11.10.1999

³⁷¹ *SSB*, 28.7.2000

Round 5's battle for survival is often won more by defeating an industry's internal weaknesses than the consumer forces.

V-C: The competitive nature of the auto industry at the 'Slippery Slope' Round.

I. Consolidation is critical to Round 5 as exemplified by the auto industry.

Majors	Shareholding structure	Other Auto Links
General Motors	Open Register	Suzuki (26%), Fiat (20%), Saab, Isuzu, Subaru (20%), (?) Daewoo
Ford	Ford family; 40% voting rights	Mazda (35%), Jaguar, Volvo, Land Rover, Aston Martin,
Daimler-Chrysler	Deutsche Bank 12%	Mitsubishi Motors (34%), Hyundai (10%)
Toyota	Toyoda Family via various crossholdings e.g. Toyoda Automatic Loom (TAL) 5.1%; Toyota in TAL 24.7%	Daihatsu (45%)
Renault	French Government owns 44.2%, Nissan 10%	Nissan (35%), Samsung
VW	German state of Lower Saxony owns blocking 18%	Audi, Skoda, SEAT; Scania (34%), Bentley, Lamborghini, Bugatti
Independents	Controlling Family	Other Brands, etc.
BMW	Quandt – 48%	Rolls Royce, Mini
Honda	Honda – Mitsubishi 'family' has 14.6%	Motor Cycles, Engines
Peugeot	Peugeot – 39%	Citroen

In 1995, 12 companies accounted for 70% of world auto production; today 6 companies do. Of the rest, *'Only the weak remain and their future is neither to difficult to predict nor especially important.'*³⁷²

2. Consolidation has reduced independents to a few family controlled hold-outs. (Ford, Fiat and Hyundai also remain family controlled.) Renault and VW have residual state holdings.

3. Competition – whilst concentrated – is fierce. Survival – as an independent or simply survival (witness the UK's Rover Group) – is at stake. The fittest are not necessarily the biggest, but size helps as this permits the R&D spend required for new models. BMW, with the best margins, may still be too small; its Quandt family may decide that they cannot afford to stay in this race.

*The current extremely competitive environment favours the big companies. Large companies in should be able to sustain profitability better than small companies at a time of limited pricing power, because of a more able to exert pressure on their suppliers. In addition, large companies may be better placed to exploit the gains from technology.*³⁷³

BOTTOMLINE: *Round 5, though exhibiting the intense competition classically associated with the idealised world of perfect competition, could yet have the highly concentrated industry structure last seen in Round 3. In this Round, the operating environment is getting tougher as the product has largely gone ex-growth; in Round 3, even if competitor numbers were increasing, there was new growth to fight for.*

³⁷² Graham Maxton of Autopolis, quoted in *The Economist*, 26.2.2000

³⁷³ *The Bank Credit Analyst*, January 2000

Once the auto industry's current Round of consolidation is complete, an uneasy 'armed truce' will likely prevail. The end game will be being plotted – if only a couple of players survive, who will they be? Boat rockers in such a fragile market know that precipitous behaviour is dangerous, perhaps suicidal. If Daimler cannot turn Chrysler to good account, will predator become prey? In this Round, defensive fear probably drives strategy more than aggressive greed; in Round 3, the opposite would most likely be the case.

By Round 5, the amplitude and duration of the PLC have become so interdependent – if amplitude falls, the PLC's 'true' profit duration would be over – that anything that benefits amplitude buys duration.

V-D: Ford's cost structure.

Nasser's cost cutting also did little to patch up Ford's woeful overseas operations. Facing mounting losses in South America, Ford announced a \$2 billion restructuring of its Brazilian unit on September 22nd. Things aren't much better in Europe, where Ford ekes out only \$245 million in profits in the first half (of 1999), on sales of \$14.6 billion³⁷⁴. MSDW's Steven Girsky says he hoped strong North American results would buy Nasser 'room to fix the rest of the world. But Ford may be running out of time.' The rivalry can only get fiercer. With every mega-merger – just in the past year, Daimler-Benz acquired Chrysler, Ford bought Volvo, and Renault took a big stake in Nissan – the industry is moving closer to the day when only a handful of companies have the scale to squeeze purchasing and manufacturing costs and plough billions into new models. In the meantime, the world is awash with

³⁷⁴ The total result for 1999 was \$28m on a turnover of \$30bn, implying a second half loss of \$217m.

*capacity: the industry can make 20 million more cars and trucks than it can sell.*³⁷⁵

1. Cost cutting defines Round 5. To avoid slipping into loss, companies must reduce the profit margin's bottom edge as they cannot raise the top edge price.

2. Inventory management is critical; Ford's averages 60 to 100 days, worth some \$6.4bn³⁷⁶. Were the dream of carrying only 5 days of stock for the 'five day car' realised, inventories would be cut by billions of dollars, annual costs by millions.³⁷⁷

3. Major auto assemblers aim to produce two million cars off the same basic platform.³⁷⁸ The logic is pure economies of scale: '*by spreading the fixed cost of investment across a variety of attractive cars, all made from the same kits of parts, the investment should deliver higher returns*'³⁷⁹. VW is the industry leader – from 30 models on 16 floor plans to 54 on only 4. BMW leads on flexible factories – it can switch 7 Series to 5 Series production overnight. GM has built the world's most integrated plant – Blue Macaw in Brazil; a central assembly plant is surrounded by 17 suppliers each delivering sub-assembled units to the hub; Ford is copying this model in Brazil's Bahia state.³⁸⁰ The most radical thinking is to outsource assembly to groups like Valmet and Steyr-Daimler-Pusch. Ford, *the inventor of the assembly line*, is considering this option in Brazil;³⁸¹ it would also shift production to lower labour cost emerging markets as predicted by Vernon.³⁸²

³⁷⁵ *BusinessWeek*, 11.10.1999

³⁷⁶ *SSB*, 31.1.2000

³⁷⁷ *The Economist*, 8.1.2000

³⁷⁸ *The Economist* 1.8.2000

³⁷⁹ *The Economist* 23.7.2000

³⁸⁰ *The Economist*. 29.7.2000

³⁸¹ *The Economist*, 12.2.2000

³⁸² Vernon R., 1965

4. In procurement, net-assisted B2B networks are increasingly the norm. Ford's Auto-Xchange B2B aims to reduce its \$83bn auto-part purchases by \$6bn over three years. Downstream dealer reduction from 2500 to 1000 is also envisaged³⁸³. Ford believes that by streamlining both suppliers and distribution, it could cut 25% off the cost of a car.³⁸⁴

5. Ford's (now ex-)CEO, Jac Nasser, made his reputation as a cost-cutter – his target for 2000 was a reduction of \$1bn³⁸⁵, mainly from rationalising European operations after the Volvo and Land Rover purchases. Ford has adopted GE's Six Sigma programme attempting to improve quality and efficiency. For example, by pinpointing why the Lincoln LS sedan did not always start first time, Ford saved \$52m in 2000.³⁸⁶

6. Ford considered a lower cost Asian location, being the original front-runner to buy Korea's Daewoo. Unable to deal Daewoo's debt mountain, it instead retreated to focus on 35%-owned Mazda of Japan.

BOTTOMLINE: Round 5 is when cost control becomes essential for survival. The product must still be purpose built for 'slippery conditions', but good driving skills – those of driving costs down and driving capital hard – count most AT THE MARGIN because they are more important FOR THE MARGIN if a company is to continue to earn 'true' profits.

Ford's emphasis is almost entirely cost-based. By reducing input and manufacturing costs, curbing inventory levels and rationalizing the route-to-

³⁸³ *BusinessWeek*, 19.2.2000

³⁸⁴ *BusinessWeek*, 26.2.2000

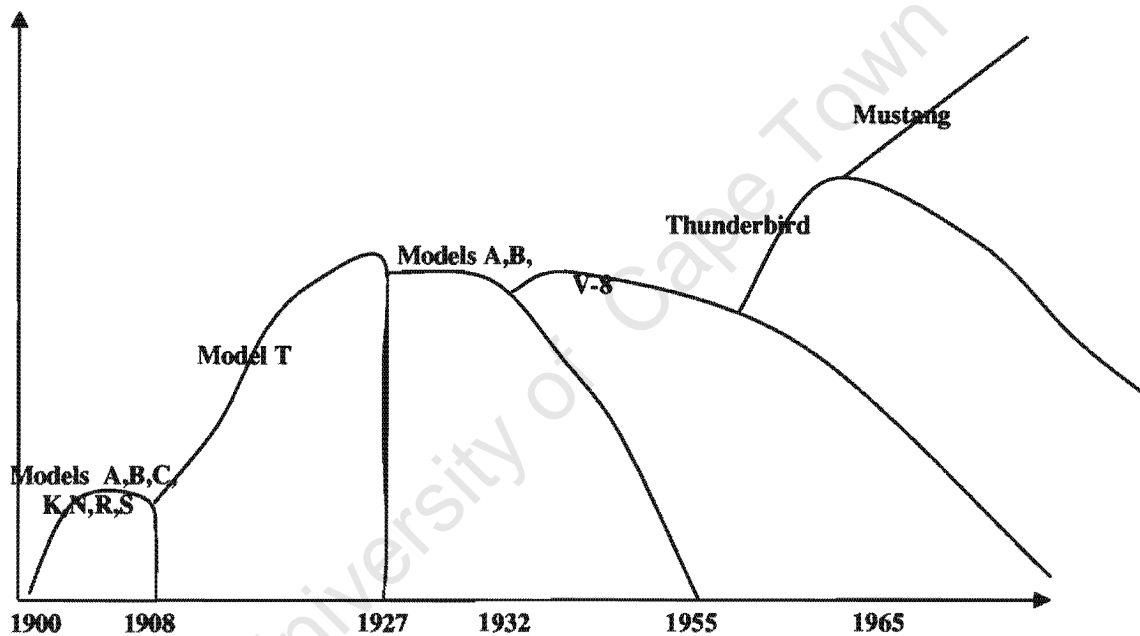
³⁸⁵ His nickname was 'Jac the Knife' Nasser.

³⁸⁶ *BusinessWeek*, 25.6.2001

market network, Ford will make most profit because this is where Ford can save most money. Cost control in Round 5 is about keeping the PLC's amplitude at 'true' profit levels, thereby buying a company its survival ticket.

V-E: Ford's product regeneration.

1. Ford arguably 'invented' the concept of regeneration. The first 60 years of its corporate life could be summarised thus:



The model T was Ford's classic offering. Yet Henry Ford made the classic mistake of sitting on a winner; General Motors's Chevrolet outmanoeuvred Ford in the mid-1920s. Jac Nasser undertook not to make the founder's mistake, approving 9 new Ford-brand models for 2000-2005.³⁸⁷ But new models rarely sell like 'hot cakes'. The 'trading-in tradition' is no longer entrenched practice; today's vehicles are more robust and last longer.

³⁸⁷ *BusinessWeek* 29.5.2000

2. Competition swiftly adopts rival technical advances as standard, making ability to differentiate narrow, especially in mass-market categories.

*Features such as air-conditioning, electronic brakes and suspension control are now becoming standard in small, inexpensive cars whereas 10 years ago they were confined to executive models.*³⁸⁸

3. Because profit levels no longer afford expensive R&D, expenditure that is done on product regeneration is tightly monitored:

*Mr Nasser's latest drive at Ford is supposed to exploit brands to sweat every dollar that the firm spends on product development, research and engineering.*³⁸⁹

But 'standing still' is not an option either; Ford's European troubles stem from its lead offering, the Fiesta, being 11 years old.³⁹⁰

The cost of research can become 'too' high. Chrysler forfeited its independence to Daimler because it could not afford the R&D required for the next generation of environmentally friendly automobiles.³⁹¹

4. As two of Ford's recent US offerings – the Contour and the Mystique (tagged the 'Detour' and the 'Mistake' respectively) – illustrate, product regeneration is hit-and-miss.³⁹² Ford had more success in Europe with the Baby Jag and the Ka although the latter cannibalised the Fiesta's market share. This

³⁸⁸ *The Economist, World in 2000*

³⁸⁹ *The Economist* 23.7.2000

³⁹⁰ *BusinessWeek*, 29.5.2000

³⁹¹ *The Economist*, 5.8.2000

³⁹² *The Economist*, 23.7.2000

suggests that car companies, as with Gillette, can become their 'own worst enemies by being their own fiercest competitors'.

5. Mass customisation is the newest trend and Ford, forsaking its heritage, has joined this '*any color*' revolution. Together with Qualcomm, it will offer custom-made telematics from 2003.

6. Ford is regenerating its product line by 'reverse engineering' back up the value-added chain via its newly acquired luxury marques – Jaguar, Volvo, Land Rover, Aston Martin. This stable of products has broadened its family of 'S' curves. The impeccable logic still underlines the gravity – in both senses – of the situation facing Ford. '*They're in a race to grow their luxury portfolio to offset the deterioration that will ultimately come in trucks*'.³⁹³

7. Some 'regeneration' is externally imposed. 'Green' pressure to reduce the gas-guzzling nature of autos means assemblers must adopt mandatory emission controls. And when Ford pledged to improve fuel economy 25% by 2003, General Motor's matched Ford's target immediately.³⁹⁴

8. The durability of brands will be tested to the full if the 'ultimate pattern' for car companies means that they give up assembly altogether and become 'VBO's – vehicle brand owners.

*They will do only the core tasks of designing engineering and marketing vehicles. Everything else, including even final assembly, will be done by the parts suppliers.*³⁹⁵

³⁹³ Rod Lache, Deutsche Bank Alex Brown *BusinessWeek*, 5.3.2001

³⁹⁴ 27.7.2000, *Ford* and *GM*'s websites

BOTTOMLINE: Round 5 regeneration is about giving the product ‘grip’ in slippery conditions. Fittingly, the products currently preventing Ford’s slide towards commoditization are multi-terrain SUVs and trucks. Meanwhile, Ford has bought higher-value-added marques to secure a foothold in ‘less slippery’, more profitable luxury niches.

Round 5 regeneration gives products steel plated ‘radial tyres’ to offset the ‘deteriorating road conditions’ brought on by rising consumer purchasing power. ‘Radials’ may help resist slippage of the PLC’s amplitude but do little to improve it, even if they extend the PLC’s duration. Operating conditions will continue deteriorating, and whilst product regeneration is necessary for avoidance of commoditization, it is not a sufficient strategy by Round 5.

V-F: Ford’s financial character.

In 2000, Ford disposed of its car parts division, Visteon. Ford rid itself of ‘the contaminating effect of its weighted average being pulled down’. Had the autoparts division commoditized? A \$2.3bn write-down acknowledged that Visteon had already destroyed value. The spinout underlines what a Round 5 company like Ford must do – not only return capital to shareholders if it must but get out of low margin businesses if it can.

I. Jurgen Schrempp³⁹⁶ was frustrated when Daimler Chrysler’s share price fell from \$103 to \$53.

BusinessWeek: Why is Daimler’s share price so low, and when will it improve?

³⁹⁵ J. Ferron of PriceWaterhouseCoopers, quoted in *The Economist*, 23.2.2002

³⁹⁶ The CEO of Daimler Chrysler

Schrempp: When? Well I don't know... I'm very impatient. We have a multiple like Ford or GM, 8 or 9. This does not reflect our potential.³⁹⁷

When a company reaches Round 5, markets will classify it more as a 'cyclical' than a 'value' stock; even the best cyclicals trade at multiples significantly less than the market average. Daimler's share price has arguably come down to a level more representative of its Round 5 status.

The auto world is a low growth, (machine) capital and labour intensive, globally competitive and highly cyclical industry...On average Ford has traded in a range between 8x and 12x trailing earnings over the past ten years.³⁹⁸

This lower multiple is the market's way of saying that the company is coming towards the end of its value-creating lifecycle. For a Round 5 company like Ford, this means a low market rating – indeed it is only the world's 89th most valuable company, still ahead of GM at 124th.³⁹⁹ Yet as the above quote from SSB illustrated, Ford can occupy Round 5 status for a long time.

Critical to a company's survival as an investible proposition in Round 5 is tight control not only of 'circulating' costs but the capital base. 'Good' Round 5 companies will be cashflow positive – yesterday's investments yielding cash today.

³⁹⁷ *BusinessWeek*, 7.8.2000

³⁹⁸ *SSB*, 31.1.2000

³⁹⁹ *BusinessWeek*, *Global 1000* 10.7.2000; it has fallen further since then.

But what if the company cannot find new value creating investments to utilise that cash? During Round 5, such cash is often applied to share buybacks.⁴⁰⁰ Other methods of returning shareholder capital, such as a special dividend, are also used; Ford can return \$10bn to shareholders under its 'Value Enhancement Plan'^{401, 402}.

In 2000, Ford's free cashflow after reinvestment but before acquisitions was \$8.5bn; in 1999, \$8.0bn. Ford's 4.2% dividend yield was more than three times the US market average of 1.2%⁴⁰³, suggesting the market sees the company with more cash than it needs for further value creation.

An aside on share buybacks

A company may decide to recycle capital back to its shareholders via share repurchases using positive cashflow or even gearing which, being tax-deductible, is cheaper to finance than equity. By reducing its capital base, a company often enhances its ROE if the profits ratio to that shrunken equity base rises. If capital shrinkage is done efficiently, a company can defer the day of commoditization, though this option is ultimately self-liquidating. Gravity will continue to weigh down on broader ROCE, from which ROE is derived: eventually there will be no equity and only debt to pay off.

...and on asset stripping.

⁴⁰⁰ Many companies, even Microsoft, have begun this practice much earlier, though often as a tax efficient way of funding share option schemes.

⁴⁰¹ *Financial Times*, 2.8.2000

⁴⁰² In the 2nd Quarter of 2001, it suspended the last \$2.8bn repurchase tranche to instead cover the \$3bn cost of the Firestone tyre recall. *BusinessWeek*, 25.6.2001

⁴⁰³ *SSB*, 28.7.2000

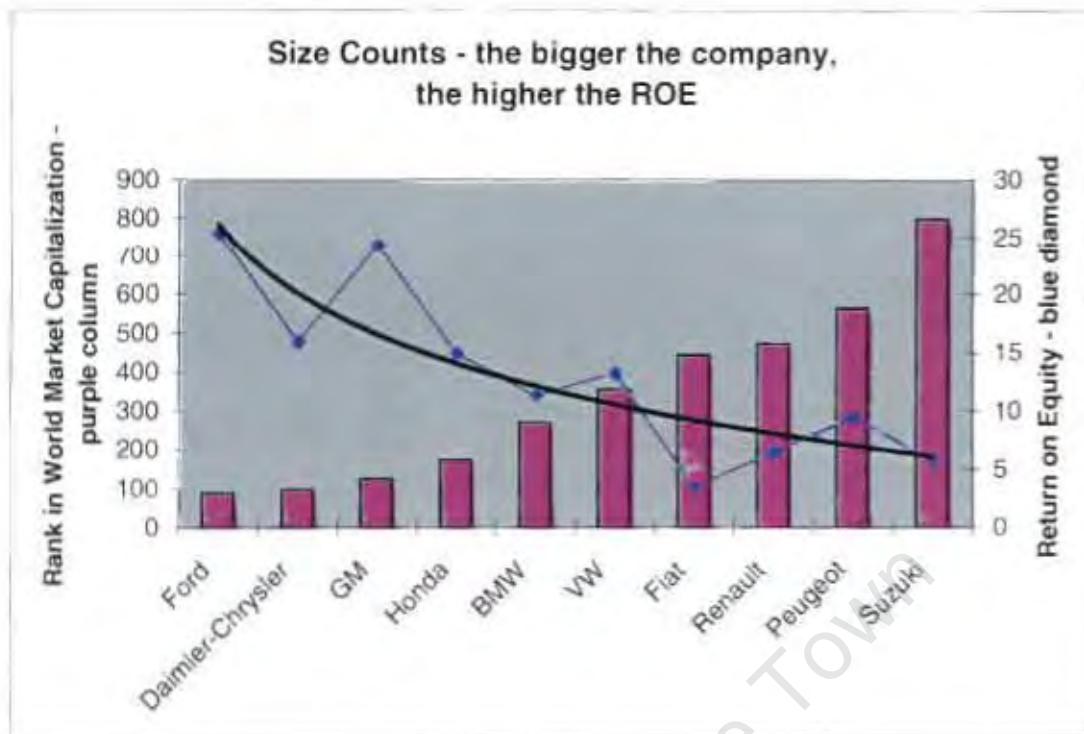
During Round 4 and especially Round 5, corporate asset strippers are active. By buying a company threatened with commoditization, they can often salvage worth from its asset base that is greater than the earnings would imply they are 'worth'. (The 1973 hostile take-over of the Hong Kong Bus Company is a classic case; the acquirors wanted the company not for its transport business but for the land occupied by their Hong Kong Central bus terminal.) An asset stripper would try to arbitrage that capital salvaged into more normal earnings – and claim, justifiably, to be 'releasing value' by doing so.

2. Many car companies are 'consuming more wealth than they are producing'⁴⁰⁴ meaning *part* of the industry is already in Round 6 and so commoditized. *The Economist* forecasted 2000 would be 'a year of profitless prosperity for car companies'.⁴⁰⁵ Profitless prosperity, an apparent contradiction in terms, is a good way to describe the unenviable lot of Round 5 'good' companies verging on Round 6 categorization. Investors generally shun such shares.

3. As the chart below shows, size still counts in Round 5. Yet, whilst market capitalization may reflect overall 'health' better than market share or turnover, size may not secure survival.

⁴⁰⁴ *The Economist*, 3.1.2000

⁴⁰⁵ *The Economist*, *World in 2000*



Trend line drawn is logarithmic.⁴⁰⁶

BOTTOMLINE: The financial character of a 'good' company in Round 5 is like that of someone who has aged well. The best years of value creation are over; there is little chance of achieving sustained, above average, growth again. The company can be huge – Ford employs 400,000 people worldwide and retains enormous status in the corporate landscape – but the cold reality is that it struggles to generate profits. The company may generate free cashflow but when it needs extra resources, it usually borrows them, not using new equity. Its equity base might be shrinking as the company battles to cover its capital charge with its limited returns. The market will heavily punish strategic moves that blunder. In this unforgiving respect, the slope is both slippery and steep. Good management of the capital base and a willingness to dispose of underperforming non-core assets will buy both amplitude and duration in its PLC, but such a battle that cannot be fought

⁴⁰⁶ *BusinessWeek 1000*, 10.7.2000. Toyota excluded because its hi-tech assets distort numbers.

forever as these weapons are ultimately self-liquidating and so self-defeating. However there is often no alternative but to use these weapons.

COMBINED IMPACT OF THE SIX CONDITIONING FACTORS ON ROUND 5 OF THE PRODUCT LIFECYCLE:

Round 5 buys time to avoid commoditization. With purchasing power all but triumphant, there is little upside on pricing-setting power. Cost savings are key. It is not just about operating cost reduction: if the capital base can be reduced, this also helps. Product upgrades are generally short-lived because, if they are good, they are quickly matched. Competition will be fierce as survival is at stake.

A good company can live in 'late retirement' for an extended period of time; Ford already has. A GREAT company will have to reinvent itself – even forsaking its founding activities – to stay alive. Take General Electric with the world's largest market capitalization at \$520bn, a P/E ratio of 55 and a return on equity of 24%: it was born over 100 years ago to make light bulbs. GE is a Round 2 or 3 company today. One company rediscovering the Elixir of Youth many times has been Finland's Nokia. Founded in the timber trade in 1865, it has progressed up the value-added chain – through rubber boots and cables – to become the world's largest mobile phone producer⁴⁰⁷.

University of Cape Town

⁴⁰⁷ Steinbock D., 2001

Round 6: 'The Sinking Ship'

As capitals increase in any country, the profits which can be made by employing them necessarily diminish. It becomes gradually more and more difficult to find within the country a profitable method of employing any new capital. There arises in consequence a competition between different capitals, the owner of one endeavouring to get possession of that employment which is occupied by another.

Adam Smith, 'The Wealth of Nations'

Cargill: Wheat or chaff?⁴⁰⁸

If the Efficient Markets Hypothesis prevailed, Round 6 companies would not exist. Either other companies would buy them or, like depleted mines, they would go out of business as they self liquidated through capital buybacks and dividends to shareholders.

Yet many value-destroying companies survive on the world's stock exchanges, often unaware they destroy value ('But we are 'profitable'; after all we pay taxes and dividends...'). If the market 'suffers their presence', there is evidence that 'EMH'⁴⁰⁹ eventually asserts itself – the ship sinks, albeit slowly. Death is eventually brought on by 'natural deselection', starvation from capital electing instead to be employed in more value creating activities.

⁴⁰⁸ This section relies heavily on data from the Cargill website, a private company, and the Financial Press. Among main articles referred to are: *Monsanto Website*; *Bunge Website*; *dbusiness.com*: 29.6.2000; *Financial Times*: 8.6.2000; 26.6.2000; 29.1.2001. *BusinessWeek*: 12.4.1999. *The Economist*: 9.3.1996; 6.6.1998; 20.3.1999; 5.6.1999; 28.8.1999; 18.9.1999; 25.3.2000. Hayenga M. and Wisner R., 1999, *Cargill's Acquisition of Continental Grain's Grain Merchandising Business*, *Feedstuffs*, February. Individual quotations separately cited.

⁴⁰⁹ Summers L. and Schliefer A., 1996; Schiller R., 2000; Buchholz T., 1999

In the US, the history of mining and agricultural stocks tells this story. Of the DJIA's 'Founding Twelve', eleven were in the primary sector: six benefited agricultural products⁴¹⁰, two were mining stocks⁴¹¹ and three gas-based utilities⁴¹². And the sole survivor, GE, is not the light bulb producer it was! Not only does today's index show that today's value is added in much more complex ways than in 1896, its make-up illustrates that few 'primary sector' companies survive. Of today's DJIA thirty, only three – Alcoa, Exxon Mobil and International Paper – could be argued to have a primary product bias, and even they are involved in a machine capital-intensive manifestation of it.

Cargill

Founded in 1865, Cargill predates the DJIA's 1896 advent. Today Cargill is a composite of the 'Founding Twelve' mixing American Cotton Oil, American Sugar, Distilling & Cattle Feeding and the gas-based utilities. Remaining a private company throughout its history has arguably ensured its survival. It never had to brave a stockmarket that favours efficient users of capital.

Cargill's private nature makes it difficult to be precise about its business fortunes. As it publishes only rudimentary financial data,⁴¹³ the financial detail revealed here is shallow compared to listed examples.

But it does hint strongly at one conclusion. Using the strict definitions of value creation employed herein, Cargill does not make a 'true' profit on its capital employed: rather it destroys value. The evidence for this – a mix of

⁴¹⁰ American Cotton Oil, American Sugar, American Tobacco, Distilling & Cattle Feeding, U.S. Leather U.S. Rubber

⁴¹¹ National Lead, Tennessee Coal & Iron

⁴¹² North American, Laclede, Chicago

⁴¹³ Despite a formal request to them for extra financial information – which is made available for clients and bankers – they would not even disclose this information for research purposes.

analysing profit trends, its industry, announced strategic reviews and various other ‘windows’ into its workings – is discussed below. Whilst this section asks how Cargill has survived, especially in its core grain trading business, it also asks ‘*Does the company have a secure future?*’

Cargill’s activities

Cargill is:

*... an international marketer, processor and distributor of agricultural, food, financial and industrial products and services with 85,000 employees in 60 countries. The company provides distinctive customer solutions in supply chain management, food applications and health and nutrition.*⁴¹⁴

The US’s largest privately-held company⁴¹⁵, Cargill has been run by professional management for decades, yet professes strong ‘family values’ and has a Cargill family board member.

Its approach has always been long-term as clearly stated in their core beliefs:

*Long-term perspective. Having the patience and foresight to build sustainable businesses for the long haul.*⁴¹⁶

Its financial priorities contrast with those of a ‘normal’ quoted company.

Over the past 20 years sales have increased from \$11 billion to over \$50 billion, and its net worth from under \$1 billion to over \$5 billion (Now close to \$8bn). This strong record of growth is no accident: for decades, the firm has aimed to double its net worth every half-dozen years or so. This serves two purposes. It has provided the family members, who put up with lacklustre dividends, with a good reason to keep most of their

⁴¹⁴ www.cargill.com

⁴¹⁵ *Forbes* 1998 ranking

*cash in the company; and it has encouraged Cargill's managers to pursue market share and size rather than immediate profits.*⁴¹⁷

Cargill's financial performance since 1996 has questioned this approach.



Though 1999's decline was overstated⁴¹⁸, the trend is clear. Recent management moves, strategic decisions and comments to the public indicate Cargill is trying to become a 'more value-adding' company.

In the succession announcement that replaced Ernest Micek with Warren Staley as CEO, Cargill's new direction was evident.

*Warren...has been a critical factor in our march into more value-added businesses and services.*⁴¹⁹

*The company is changing from 'an asset-intensive commodities company to a knowledge-based, solutions-oriented enterprise.'*⁴²⁰

⁴¹⁶ www.cargill.com

⁴¹⁷ *The Economist*, 6.3.1996

⁴¹⁸ It includes one-time trading losses in Russia.

⁴¹⁹ www.cargill.com

⁴²⁰ www.cargill.com

In refocusing businesses towards value-addedness, Cargill has sold assets, ending its long-standing 'buy, hold and extend'⁴²¹ strategy.

Cargill... is to sell its coffee and rubber businesses to focus on value-added products. Cargill is the second big rubber trader to leave the arena; Lewis & Peat collapsed under financial strains in January.

*The sale of the global (non-US) seed business to Pioneer for \$1.4bn in 1998; the US business is still for sale, an earlier agreed sale for \$650m having lapsed.*⁴²²

Underlining this determination, Cargill acquired most of the worldwide marketing business of its biggest rival, Continental Grain, in 1998. Bulking up the bulk grain exporters had obvious economies of scale implications.

*Dominant players can potentially squeeze their suppliers as well as their customers. In farming, the continued concentration of agribusiness is putting pressure on independent farmers. This trend should only continue in the aftermath of Cargill Inc.'s July acquisition of Continental Grain Co.'s grain business, giving Cargill almost one-third of the U.S. grain export market.*⁴²³

The reason for the merger was clear.

...Our purchase of Continental's grain business has been lumped with other mergers that, in fact, are 100 times larger in their scope. Some of these concerns stem from low commodity prices, even though this acquisition played no role in causing today's low grain prices. The same forces that produce low farm prices – growing stocks in the face of weak global demand and a strong dollar – squeeze already razor-thin grain handling margins. Cargill and Continental did not cause or even

⁴²¹ Contrast this to Microsoft's 'embrace, extend and extinguish' policy!

⁴²² *Financial Times*, 6.6.2000

⁴²³ *Business Week*, 18.9.1999

*contribute to low farm prices, and our businesses suffer from those same pressures.*⁴²⁴

VI-A: The purchasing power faced by Cargill.

1. Cargill sells mainly to food manufacturers and governments. As recent financial underperformance at Bestfoods and Quaker Oats illustrates, Cargill's customers are under intense margin pressure because from own-brand retailers, which has forced food manufacturers to cut their own costs. Ingredient suppliers like Cargill have been squeezed between demanding consumers and near-bankrupt producers. Cargill's response underlines the near capitulation of pricing power to purchasing power:

*Increasingly the challenge to the market place will be to produce what customers want rather than sell what farmers produce.*⁴²⁵

2. In an oversupplied market characterised by 'shelf-life', 'big' Cargill may be a prince but the consumer is sovereign. Making a trader's commission on the sale price, Cargill is quintessentially a price taker. In the meatpacking sector, Cargill's Excel has, with three other players, a combined US market share of 82%, up from 36% in 1980. Even with this market concentration, margins are less than 1% of sales, mostly being derived from sale of non-meat items like retinas to drugs companies.⁴²⁶ This business lives in the Paddock of Abundance: efficiency is impossible while 730,000 ranches out of 900,000 supply less than 50 head of cattle a year for slaughter. With land expensive compared to its expected economic yield, consolidation is unlikely. Many

⁴²⁴ President of Cargill's testimony before the Senate Agriculture Committee's hearings on the merger; emphasis added; from www.cargill.com

⁴²⁵ President of Cargill's testimony before the Senate Agriculture Committee's hearings on the merger; emphasis added; from www.cargill.com

ranches remain weekend retreats for ‘urban cowboys’.⁴²⁷ US farming is rarely financially viable without subsidies: NOPAT rarely covers the capital charge. In the developed world, *the theory of the value-adding firm rarely meets with the theory of the value-adding farm.*

3. Overcapacity in Cargill’s business areas is a semi-permanent state of affairs. In all but one of the past twelve company quarterly results, ‘overcapacity’ is mentioned to excuse weak performance. In the exception⁴²⁸, weak quarterly earnings were rather linked to ‘*global financial turmoil that ...engulfed much of the world*’ – reference to the Asian Contagion and the LTCM affair. One announcement was particularly revealing:

*Commodity prices suffered their third straight year of decline due to the mismatch of weakened purchasing power in key markets and successive big global harvests...*⁴²⁹

The Financial Times went further: ‘*a flood of commodities from producers seeking to get anything they could increased supply as demand weakened.*’⁴³⁰ This is classic Round 6 behaviour: supply runs ahead of demand and, excepting occasional cyclical rises in capacity utilization, stays there. Real prices fall as farmers sell crops for ‘*anything they can*’.

BOTTOMLINE: Cargill earnings are mostly commission based. In earlier Rounds, value-added mark-ups are more likely to be the source of income.

⁴²⁶ *The Economist*, 9.3.1996

⁴²⁷ *The Economist*, 9.3.1996

⁴²⁸ www.cargill.com 20.10.1998

⁴²⁹ www.cargill.com 10.8.1999

⁴³⁰ *Financial Times*, 6.6.2000

Traders are beholden to their industry's price trends. Cargill is being ground between growing supply from an increasingly fertile agricultural sector worldwide and the desperate tactics of the world's food companies, themselves pressured from retailers disintermediating branded manufacturers and dealing directly with processors.

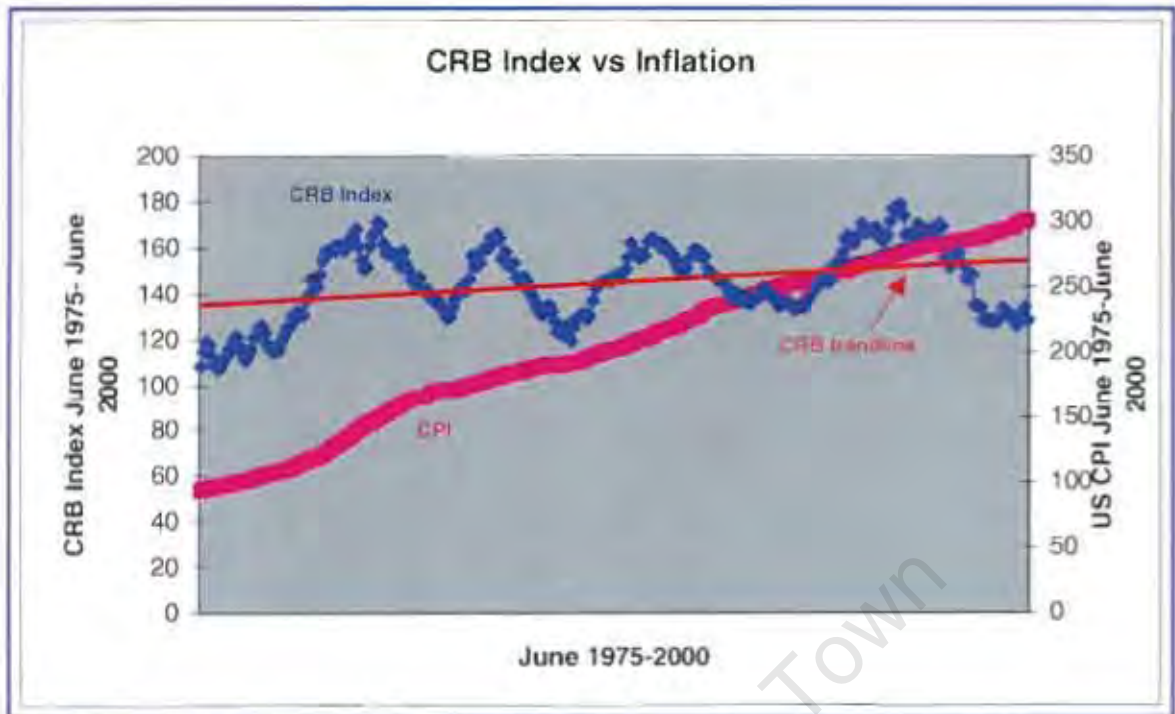
The consumer is king; collective purchasing power is almost unrestrained. Cargill may bemoan weak purchasing power as manifested in demand's level but it is what it can be, given the price. Price clears below clearing where costs are covered and true profit generated. This defines the Sinking Ship Round – more water is coming in than each sale bails out: the ship is slowly sinking.

In Round 6, markets are in structural oversupply. With agricultural products, Western Governments are fighting an extended rearguard action to prevent free market forces from putting their farming 'out to grass'. This behaviour, driven by democratic political necessity, seems unlikely to change.

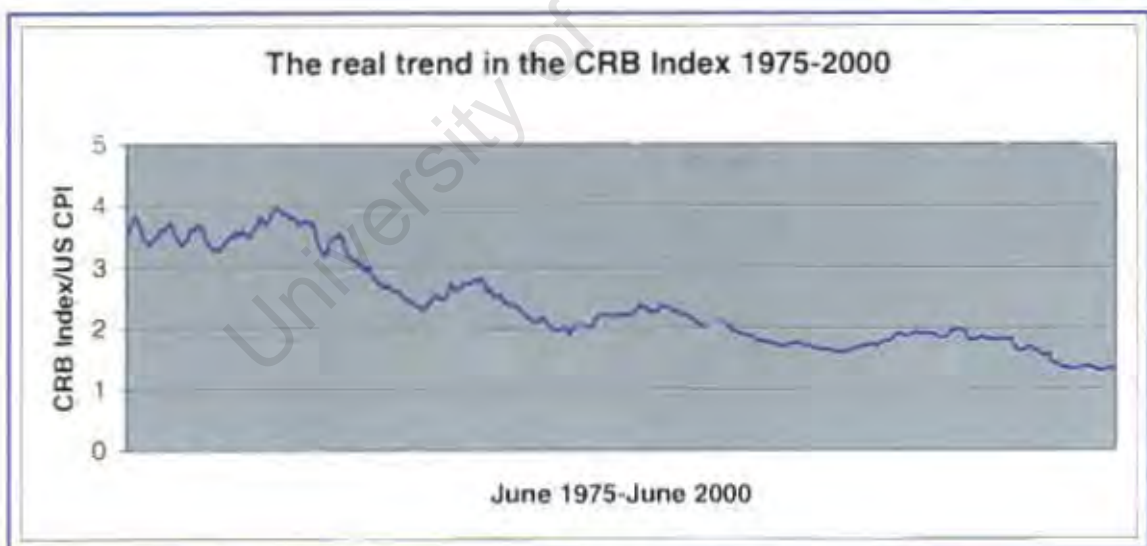
Round 6 sellers capitulate to almost Godfather-like threats when faced by their buyer – 'he made me an offer I just could not refuse.'

VI-B: Cargill's price-setting power.

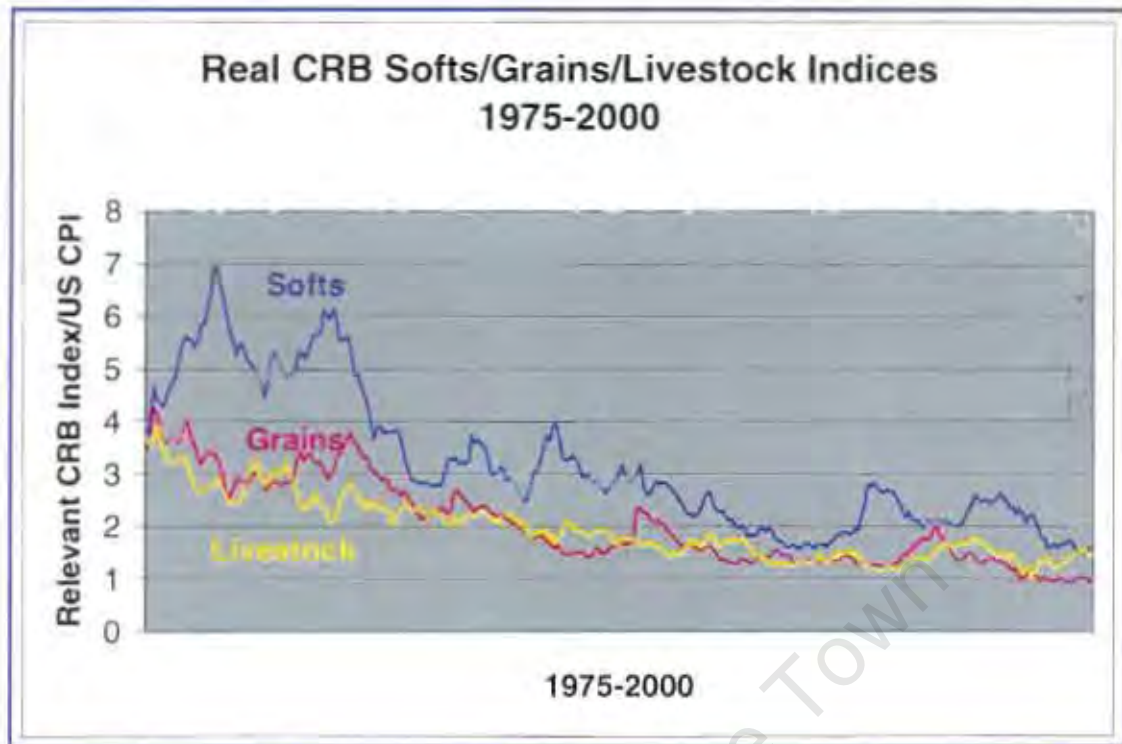
I. The recent price history of commodities amply illustrates the weakness of price-setting power. The CRB index for the past 25 years has been flat in nominal terms, rising less than 0.5% per annum as CPI has tripled.



The real CRB index is down 63% over the past 25 years.



This bigger picture is confirmed by the three major sub-indices – for softs (down 57%), for grains (down 73%) and for livestock (down 60%).



The following quotation underlines the reality of farming in America's Midwest.

All across the Great Plains, small towns are losing their livelihood. Crop disease, drought, floods and blizzards have ravaged North Dakota's farms. Even worse, as the area's anxious farmers will tell you, is the seemingly limitless fall in the price of grain and beef. Record world supplies of grain, and a remarkable dearth of crop disasters outside America, have made much of the wheat here worth little more than chaff.⁴¹¹

This is the Paddock of Abundance Cargill must live in. Only by reducing costs and – where possible – growing throughput can it grow profits.⁴¹²

⁴¹¹ *The Economist*, 18.9.99

2. Cargill was quick to adopt Internet trading in an attempt to improve margins even if, by using ‘a better mousetrap... the mice are getting smaller’.⁴³³

BOTTOMLINE: A Round 6 company's price-setting power is negligible given chronic oversupply and ‘insufficient’ demand. In previous Rounds there was still a true profit margin to fight for; by Round 6, that margin has fallen below the ‘Plimsoll Line’ – see Section 11e – and the producing industry is sinking. What tactics can be used to defend negligible amplitude and non-existent duration? Supply’s blade, with elasticity very high on the upside and inelastic on the downside, is ‘blunted’. Product homogeneity prevails and upgrade advantages are fleeting. Yet competition remains gladiatorial, even in the Twilight Zone. Pockets of profit rarely endure as barriers to entry are so low. And the defence of bigness is academic. So what if Cargill has a 50% market share of the 4m-bushel US grain export business? Installed capacity is 14m bushels.

VI-C: Cargill’s competition

I. Cargill, a giant in areas like grain handling, still faces fierce competition. Low barriers to entry (seven of the largest 10 US grain handlers in 1995 were not there in 1980⁴³⁴), significant overcapacity and the massive influence of traders on the futures exchanges (only 1% to 2% of futures contracts are settled by physical delivery)⁴³⁵ make this market as near to that still unattainable world

⁴³² This is probably the reason why Cargill is at the forefront of the campaign to promote free trade in agricultural products worldwide.

⁴³³ Lewis M., 1999

⁴³⁴ Cargill’s Testimony to Senate Agriculture Committee, January 1999; www.cargill.com

⁴³⁵ www.cargill.com

of perfect competition as it is possible to imagine.⁴³⁶ Cargill's Senate testimony during its Continental Grain take-over hearings strongly suggests this.

Five points summarize why this acquisition will not negatively affect export competition:

First, export sales reflect competitive bidding in an open, essentially public marketplace; they do not flow automatically or directly from ownership of physical assets.

Second, Cargill must compete with all other grain buyers, not just exporters, in attracting grain for export. Against the large domestic marketplace of elevator companies, processors, feeders and traders, the combined business is much too small to affect price.

Third, substantial excess capacity in export handling facilities (14m bushels vs. a trade of 4m bushels), the presence of different types of competitors and the need to draw grain past domestic users to put it in export position all result in very aggressive competition for export business.

Fourth, barriers to entry in exporting are extremely low, with many players participating who have no physical assets; also transportation arbitrage can often pit different coastal ranges against each other.

Finally, the resulting market is not controlled by anyone, and market shares are vulnerable to quick erosion. Country elevators and other sellers to exporters have a rich range of options in an industry where margins are small and subject to intense competition.

2. The issue of 'contestability' rather than 'market share' as the guiding principle of anti-trust policy becomes relevant here.

⁴³⁶ The *Thompson and Dahl* study of the US grain industry, 1979

	Cargill + Continental	Top four firm concentration
Corn	42%	81%
Soyu	31%	65%
Wheat	19%	47%

Even though the Continental acquisition saw Cargill's market share rise and market concentration increase, translating this into 'market power' as defined by US competition authorities – the ability to manipulate prices and keep them above free market levels – is almost impossible because the market still remains highly contested.⁴³⁷ Cargill may appear to be a monopolist but, because 'monopoly rents' are non-existent, it can only ever be a 'benign' one.

3. The US Department of Agriculture has been unable to find evidence of price-fixing in Cargill's markets⁴³⁸ though an ADM employee has suggested that this does occur.⁴³⁹ If so, the status of companies like Cargill would bring to mind that uniquely American phrase: 'huddled masses', companies with massive turnovers huddling together to shelter from the harsh winds of competition.

BOTTOMLINE: Competition in the Sinking Ship Round is arguably meaningless because 'there is no value left to fight for'. Yet competition continues whilst 'survival' is possible in this Twilight Zone.

Size has residual advantages but drawbacks too. Round 6 companies can be like supertankers: large, unwieldy organizations, too heavy to manoeuvre into short-lived opportunities, too set on their traditional courses to change direction quickly.

⁴³⁷ Staff paper from University of Iowa (edited by Hayenga M. and Wisner R.), January 1999

⁴³⁸ *The Economist*, 9.3.96

⁴³⁹ *The Economist*, 17.6.99

Cargill – for all its history and reputation – faces this fate. Competition from financial trading houses is intense. ‘Structured products’ – which allow small amounts of capital to be leveraged intertemporally – can capture what small margins remain. This form of competition – from a different vessel altogether, but still a rival – is often impossible for ‘supertankers’ to fend off.

VI-D: The cost structure of the agricultural product trading industry at ‘The Sinking Ship’ Round.

1. As price takers, Cargill’s operational costs must be minimal.

*These have been tough times for everyone in agriculture. We continue to invest the majority of the company's cashflow in developing new products and technologies, strengthening our services and lowering costs.*⁴⁴⁰

2. Cargill must buy from suppliers whose cost structure is even more precarious than its own – in 1999, Midwestern pork prices fell to \$8 a hundredweight, one third the cost of production.⁴⁴¹ The US Justice Department remains ‘vigilant’ on farmers’ behalves, reflecting the democratic reality that those caught in commodity traps usually ‘yell loudest’.^{442, 443}

⁴⁴⁰ www.cargill.com, January 2000 Quarterly Report; emphasis added

⁴⁴¹ *The Economist*, 28.8.1999

⁴⁴² *BusinessWeek*, 12.4.2000

⁴⁴³ BusinessWeek Question to Donald Glickman, Former secretary of Agriculture: *What was the upshot of your recent discussions with the Justice Dep.'s antitrust chief, Joel I. Klein?* A: *Over last 30 to 40 years, agriculture has not been a prime focus of our antitrust enforcers. But Joel Klein has indicated to me that he wants to make sure agriculture is not neglected. It is something we have to be very engaged in with the Justice Dept and the FTC [Federal Trade Commission]. We are becoming more vigilant now.* BW Question: *What would a more vigilant government actually do?* A: *We have to identify and develop a role that protects farmers. I don't know specifically yet what that role ought to be. But it may be in the contract rights area, or the patent and copyright area, or it may be in the antitrust area.* *BusinessWeek*, 12.4.2000

Driving down costs by paying less to suppliers is – while good business sense – risky business for Cargill, as this might drive clients out of business. It has always positioned itself as a ‘friend of the farmer’, though given its recent merger with Continental Grain, this line is wearing thin.

As the web of mergers and alliances among agricultural companies grows, farmers are feeling trapped. With the same companies providing the inputs and buying the outputs, they fear losing control over their industry and blame government authorities for not doing enough to protect their interests. Not that complaining will do much good. Pig farmers, chicken farmers and vegetable growers have got used to such industry integration. Now it is the corn and soya bean farmers’ turn.⁴⁴⁴

BOTTOMLINE: *Cost structure for a trader can be a ‘simple’ electronic trading facility or – as with Cargill – include the logistical ‘chokepoint’ dimension (grain silos, elevators, harbour handling facilities.) But when such chokepoints cease to be in short supply, they become cost burdens not revenue advantages; outsourcing such activities is usually more efficient.*

The danger remains that once a trader has outsourced all handling aspects, big players in the broader value-added chain may ‘outsource’ the traders by disintermediating them. Operating costs of the chokepoint variety are, in Round 6, usually a two-edged sword – sometimes (at rare highpoints in a cycle) they are coverable and confer advantage; mostly they are not coverable and constitute a burden that a trader with razor-thin margins can ill-afford.

The cost of capital is not coverable in Round 6. But companies can continue in business. With ‘grandfathered’ operating infrastructures, so long as cash-

flow covers operational costs, interest due and taxes owed, the firm 'lives to fight another day'. This Twilight Zone is not well understood even by many businessmen but it is critical to understanding this thesis.

VI-E: Cargill's product regeneration strategy.

1. Most agricultural products defy upgrading. Branding is complicated though successes – Blue Mountain Jamaican Coffee, Bordeaux wines – exist. Minor value-added opportunities occur – Cargill's preparation of case-ready beef or low-calorie sweetener erythritol from corn – but such advantages are short-lived as the upgrade quickly becomes the industry standard.

2. Echoing Ford's new auto lifecycle strategy, Cargill's approach has been '*to take our basic expertise in food and agriculture to new levels of value and customer service.*'⁴⁴⁵

3. By Round 6, there is very limited 'free' cashflow available to finance R&D.

4. With product upgrading not really feasible, diversification into related fields is an alternative. Cargill recently acquired a 5.3% stake in Purina Mills, the largest US producer of livestock feed, possibly as a platform for a full bid.⁴⁴⁶

BOTTOMLINE: Though there are many grades of grain and other such commodity products, substitutability is high, fungibility commonplace. A healthy futures market is a tell-tale sign that a company might live in the world of a commodity: tomorrow's characteristics are the same as today's with little chance of upgrading making a meaningful difference.

⁴⁴⁴ *The Economist* 2.3.1999

⁴⁴⁵ www.cargill.com

⁴⁴⁶ *Financial Times* 20.5.2001

VI-F: The financial character of the industry at the 'Sinking Ship' Round.

1. Cargill's earnings statements betray its financial character.

*Cargill's businesses are inherently cyclical, and we expect some variability in earnings.*⁴⁴⁷

Though cyclical pressures and rising energy costs are cited as mitigating factors, 2001 will be less profitable than 2000.

Cargill earns \$99 million in 2000-01 third quarter⁴⁴⁸

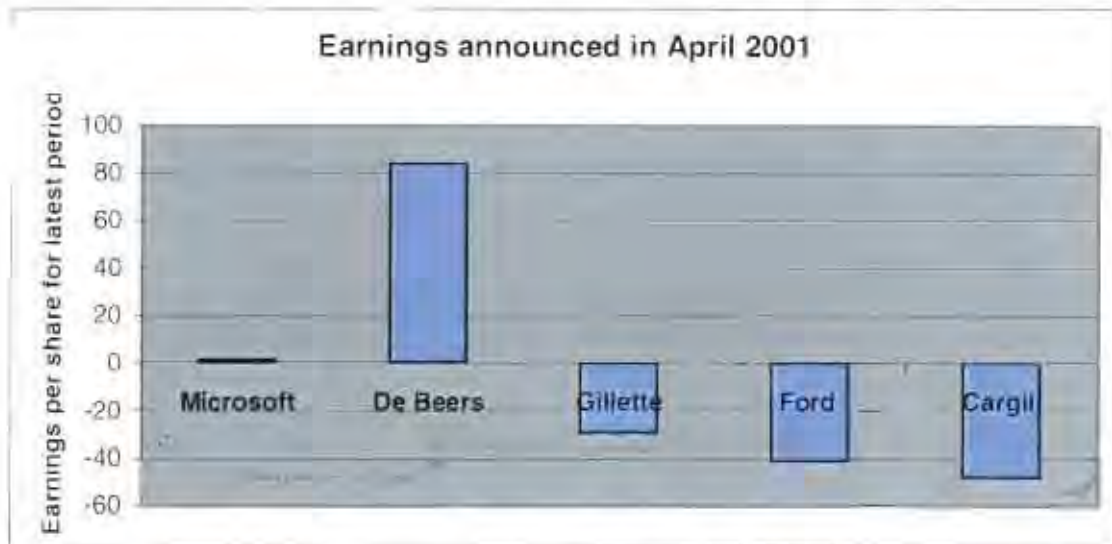
MINNEAPOLIS -- Cargill today reported \$99 million in earnings for the third quarter ended Feb. 28, down 48 percent from the year-ago level. Earnings for the first nine months of fiscal 2001 totalled \$445 million, an 8 percent decrease from last year.

All six cited of the case studies (but VALS's IPO is not relevant here) released earnings figures during April, 2001; a discernable pattern emerges.

	EPS	For period	Comments
Microsoft	+1.2%	Quarter ending 31.3.2001	Results for current year unlikely to see decline
De Beers	+84%	Year to December 2000	Results for 2001 will decline in line with cyclical slowdown
Gillette	-29%	Quarter ending 31.3.2001	Inventory costs, mainly flat volumes, batteries facing price squeeze
Ford	-41%	Quarter ending 31.3.2001	US profits declines, rest of world still largely loss making
Cargill	-48%	Quarter ending 31.3.2001	Commodity price declines and rising energy costs

⁴⁴⁷ www.cargill.com, 21.4.1998

⁴⁴⁸ www.cargill.com, 16.4.2001



All data sourced from the Financial Times

The shape drawn is 'too good to be true', and some qualification is necessary.⁴⁴⁹ But it illustrates how 'cyclicality' affects the various PLCs: the later a product is in the cycle, the greater likelihood that its earnings will be negatively affected by any economic slowdown.

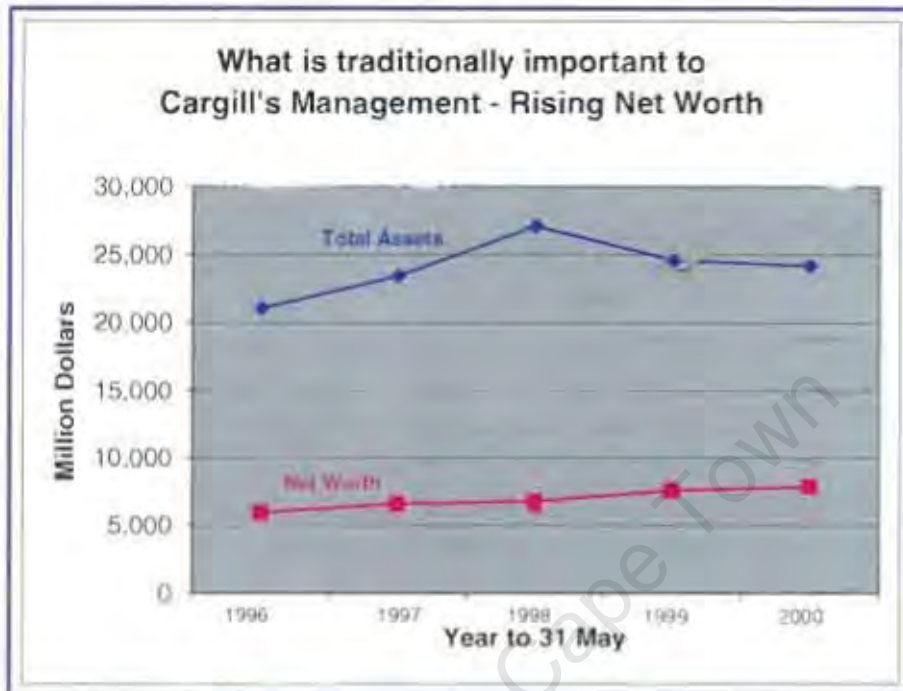
2. Cargill is unhappy with its structure and strategy. The new emphasis on value-added services, getting out of peripheral businesses⁴⁵⁰, reduction of exposure to higher risk trading activities⁴⁵¹ and acquisition of Continental Grain all suggest the 1995-2000 decline in net earnings to sales (1.6% to 1.0%), to net assets (4.3% to 2.0%) and to net worth (15.2% to 6.1%) are no longer acceptable to the management. Its traditional performance benchmark – doubling net worth every five years – continues to show delivery but this may not be sufficient to keep family shareholders (now an unwieldy 70 strong, twice as many as thirty years ago) happy forever, a risk presaged by *The Economist*

⁴⁴⁹ VA Linux was included as a case study because of its 'hot cake' IPO experience not because of the business it is in. De Beers's figures are for the year to 31.3. 2001 and are not *strictly* comparable.

⁴⁵⁰ Seeds, cocoa and rubber

⁴⁵¹ Commercial mortgages in Access Financial – 1998; financial trading of emerging market debt – 1999.

in 1996.⁴⁵² Dividends are kept to a minimum to allow re-investment of cashflow, currently running at about \$1.7bn a year.⁴⁵³



Bunge, the venerable Argentine integrated foods group, recently undertook an equivalent transformation. It is exiting its packaged goods businesses in Argentina, Brazil, Venezuela and Australia and concentrating on agribusiness.

Bunge says it will invest more than \$1 billion over the next five years in expanding these businesses – a modest amount, and less than half of what it might hope to get for its retail-food units. This suggests that one reason why the family shareholders are pushing through the current sale is to cash in some of their assets⁴⁵⁴. To persuade them otherwise in

⁴⁵² www.cargill.com

⁴⁵³ www.cargill.com, 8.8.2000

⁴⁵⁴ This argument has a parallel example in the debate surrounding the demutualisation of life insurance companies – see *Financial Times*, 8.8.2000

*future, Bunge's managers will have to show they can manage companies, and not just trade them.*⁴⁵⁵⁺⁵⁶

This is Cargill's challenge; with net worth of at \$8bn, perhaps family members would prefer the capital to the dividends. With the 5.8% yield on net worth barely more than the risk-free 30-year T-Bill, the reasoning behind such a decision might also be financially logical.

Cargill's management are not giving up.

*While (restructuring our organization) entails some short-term pain, we believe that at 135 years old Cargill is just getting its second wind.*⁴⁵⁷

Is this strategic reorientation the last chance the management has before the Cargill family follow the Bunge family and cash in their capital chips?

BOTTOMLINE: How can one characterise a company whose returns are consistently below its cost of capital charge? Any disciplined manager of risk capital will avoid such a proposition.

Some of the Cargill family must be thinking about breaking-up S.S. Cargill while its assets still have a salvage value. Given market conditions prevailing in Round 6, it is rare that reinvesting cashflow in more value adding activities – Cargill's current strategy – allows companies to escape; most simply buy more time in the Twilight Zone.

⁴⁵⁵ *The Economist*, 6.6.1998

⁴⁵⁶ *The Economist*, 6.6.1998. The same fate has recently met EDF Man; the 217-year-old British commodity trader except Man disposed of its agricultural products business and kept its fund management arm. (*Financial Times* 8.6.2000) This in turn echoes the rise and fall of New York trader Philip Brothers (PhiBro) which, having bought Salomon Brothers with the excess profits of the oil and commodity price rises of the early 1970s, was eventually swallowed by Salomon.

⁴⁵⁷ www.cargill.com *Financial Results Statement*, 8.8.2000

COMBINED IMPACT OF THE SIX CONDITIONING FACTORS ON ROUND 6 OF THE PRODUCT LIFECYCLE:

By Round 6, there is negative amplitude in the PLC and so no duration. Yet a Round 6 supertanker *can* give the impression of being sea-worthy – cashflow can be positive, even ‘profit’ earned, allowing it to pay taxes. But the tsunami of purchasing power will regularly overwhelm what little pricing power remains. Upgrading might plug the holes in the product’s superstructure, but repairs are short-lived and new holes appear. Costs can be jettisoned, but rarely allowing the Plimsoll Line of value creation to resurface. The low ‘bows’ that make up entry barriers mean wakes of competitive supertankers regularly swamp the decks.

Companies like Cargill can take an age to sink. Ideally the ship’s owners would instruct the captain to beach the ship so that some value can be salvaged from it. (This *is* what happens in the world’s shipping industry, the favourite destination being ‘Break-up Beach’ in Pakistan.) When in this precarious state, few new owners would climb on board with their capital – unless the discount was sufficiently deep to give that new owner a trading profit from the break-up value.

Round 6 is the end game. The outstanding question is usually ‘how long will it be before those with capital at risk realise it ...and realise it?!’ For reasons that can often have more to do with political sentiment than economic rationality, this end-game can be very drawn out. Where politically sensitive, such sinking ships are often kept afloat on a sea of subsidies.

For the likes of Cargill, the end will most likely come when the family decide to 'pull the plug'. Given the salvage value still available from Cargill's asset schedule, this might happen sooner rather than later as salvage values tend to be fast wasting assets.

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5 d) Section Summary – Pricing Power and the PLC

At Baring Asset Management, when we assessed the attractiveness of a country at the macro level or a stock at the micro level, we employed a ranking technique to help identify gain and avoid loss. In the opinion of the external consultants whose views increasingly drive fund management industry practice, such methodology is regarded as a rigorous, repeatable, transparent process.

The ranking tool contributes to the stock selection process and so influences capital market perception of a given company, its cost of capital and its evolution. In a sense, it is analogous to how natural selection might influence the evolutions of species – it attempts to measure ‘fitness’ according to a number of separately identifiable conditioning factors.

Whilst preference rankings are essentially ordinal within the context of a single question, a degree of cardinality emerges as a result of asking a series of questions and aggregating the ordinal preferences. What emerges is a weighted average measure that reflects not just quantity but quality, much in the same way as the weighted average cost of capital commensurates all those factors that go into a more balanced determination of risk.

Ranking is used in the table below to summarise the micro case studies. However the IPO of VA Linux is not included because most of the ‘Twenty Questions’ posed would not be meaningful in the context of what was essentially a static event. That said, as the case study for Round 1 showed, pricing power at the launch stage of a product’s life cycle – in this case before the market can get a proper ‘handle’ on a share’s valuation – can be *almost*

limitless. But as the post-IPO share history of VA Linux also illustrates with chilling clarity – the share is down 99.5% from its first day highs – if the market subsequently discovers that the company has virtually no pricing power in its business, it will be accorded virtually no value in its share price.

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Determining the Strength of Pricing Power and the Shape of the PLC

	Microsoft	De Beers	Gillette	Ford Motor Company	Cargill
1 Can the company raise real prices?	Yes	Maybe	No	No	No
2 Can the company raise nominal prices?	Yes	Yes	Maybe	No	No
3 Can the company prevent price falls?	Yes	Yes	Yes	Maybe	No
4 Can the product be easily differentiated?	Yes	Maybe	Maybe	Maybe	No
5 Does the consumer have a wide range of product options?	No	Maybe	Maybe	Yes	Yes
6 Is price virtually the only consideration in the purchase decision?	No	No	No	Maybe	Yes
7 How intense is competition?	Low	Increasing	Increasing	High	High
8 How high are barriers to entry?	High	Medium	Medium	Low	Low
9 Is the company facing accessible economies of scale?	Yes	Maybe	Maybe	No	No
10 Is cost cutting the primary focus?	No	Maybe	Yes	Yes	Yes
11 Is the industry plagued by surplus capacity/inventory hand-over?	No	Maybe	Yes	Yes	Yes
12 Is the company based on knowledge/brand/others?	Knowledge	Brand	Brand	Others	Others
13 Can free cash flow easily finance R&D?	Yes	Yes	Yes	Maybe	No
14 Is R&D durable in that it is not easily copied?	Yes	No	No	No	No
15 How durable are profit margins?	High	High	Medium	Low	Low
16 Do revenues grow above, in line with or below market average?	Above	Above ¹⁵⁸	In line	In line	Below
17 Where does the company's share trade vs. the market?	Above	Above ¹⁵⁹	Average	Below	Below ¹⁶⁰
18 Are share buybacks a serious consideration?	Maybe	Maybe ¹⁶¹	Yes	Yes	Yes ¹⁶²
19 Is net cash on balance sheet 'tolerated' by the market?	Yes	Maybe ¹⁶¹	Maybe	No	No ¹⁶²
20 Is the company a growth/ value / cyclical stock?	Growth	Growth ¹⁶³	Value	Cyclical	Cyclical ¹⁶²
Broad measure of pricing power out of 100	98	74	56	30	20

Key: **Best: 5 points**

Average: 3 points

Worst: 1 point

Because the 'worst' minimum mark out of 100 is 20 not 0, pricing power's 'percentage' is calculated by subtracting 20 from the above score and then dividing the residual by 80.

Microsoft: 97.5%

De Beers: 67.5%

Gillette: 45%

Ford: 12.5%

Cargill: 0%

¹⁵⁸ They may exist, but because of capacity surpluses/inventories, they are not accessible.

¹⁵⁹ De Beers is now private; proxy used is Tiffany.

¹⁶⁰ Cargill is a private company; proxy used is IBP Foods.

To illustrate how this sort of ranking would be reflected by the capital markets, the following chart first summarises the price earnings multiples of the five relevant companies⁴⁶¹.

Round	Company	P/E Ratio	Comment
Two	Microsoft	39	Under 'Judge Jackson's discount'?
Three	Tiffany (De Beers's Proxy)	26	Luxury branded goods
Four	Gillette	24	Entering the 'Circle of Doom'?
Five	Ford	10	Barely value creating
Six	Cargill	n/a	Not covering cost of capital

These valuations are now juxtaposed with the pricing power percentage derived above. To market analysts, the following chart is intuitively 'obvious' but it nevertheless confirms the idea that a company's pricing power – which is in its simplest definition reflects a company's ability to earn profits – will be reflected in its market valuation. It therefore suggests that a PLC has a *matching market value lifecycle*.



⁴⁶¹ All figures from *BusinessWeek's* 10.7.2000 *Global 1000* survey

In the macro section that follows from Section 7), it will be suggested that the evolving wealth of nations is also subject to lifecycles, each one being derived from the companies operating in a particular nation.

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Section 6.

Micro Sections Summary: The PLC – past, present and future

This section summarises the findings of the first half of the thesis by first looking at the past, present and future of the lifecycle and then recapping how value is likely to be created at the company level.

6 a) What is the modern durability of a PLC?

*Technology is moving so quickly that products are dead in 18 months.*⁴⁶²

Durability is defined herein as the ability of a product to resist the downward pressures of purchasing power and thereby allow pricing power to translate into sufficient value-added to allow companies to recoup their investment, including an appropriate charge for capital. As noted already, though by definition there is a time dimension to this concept, it is not as time critical as it might appear at first glance.⁴⁶³ The most important aspect of durability is that the ‘hardness’ of pricing power that must be translated into value-added margins (be those margins generated over a long or short time period) be sufficient for the upfront investment to be recouped in present value terms.⁴⁶⁴

⁴⁶² *Donald Listwin*, executive vice-president of Cisco, quoted in *BusinessWeek*, 4.10.1999.

⁴⁶³ There *are* cases of a price being paid before the product has been made. The author Amy Jenkins was advanced £600,000 for a book not yet written. (Louise Moore, Managing Editor of Penguin Books, quoted in *The Independent*.) In the US, Tom Clancey received a \$45million advance for his next two books – *The Sunday Independent*, 11.3.2001.)

⁴⁶⁴ Hollywood conventional wisdom has it that if a blockbuster has not recouped its production costs in gross ticket sales within 4 weeks of opening, it will be a flop because the ‘fade’ is always dramatic and will be even more so if the film is not drawing in the movie-goers.

Q1. *As for character of the duration, can one say that the shape of the PLC is changing, with more value being created close to the product launch and less later on?*

A2. Yes: with successful new product launches, the rate of market penetration is often quicker, implying that the value-adding phase of a PLC can be ‘bunched up’ at the front end of the curve.⁴⁶⁵ Consequently, lifecycles do appear to be shortening.

Q2. *For businesses, this view of the ever shortening PLC must be quite depressing: is there any way to stop - or at least mitigate - it?*

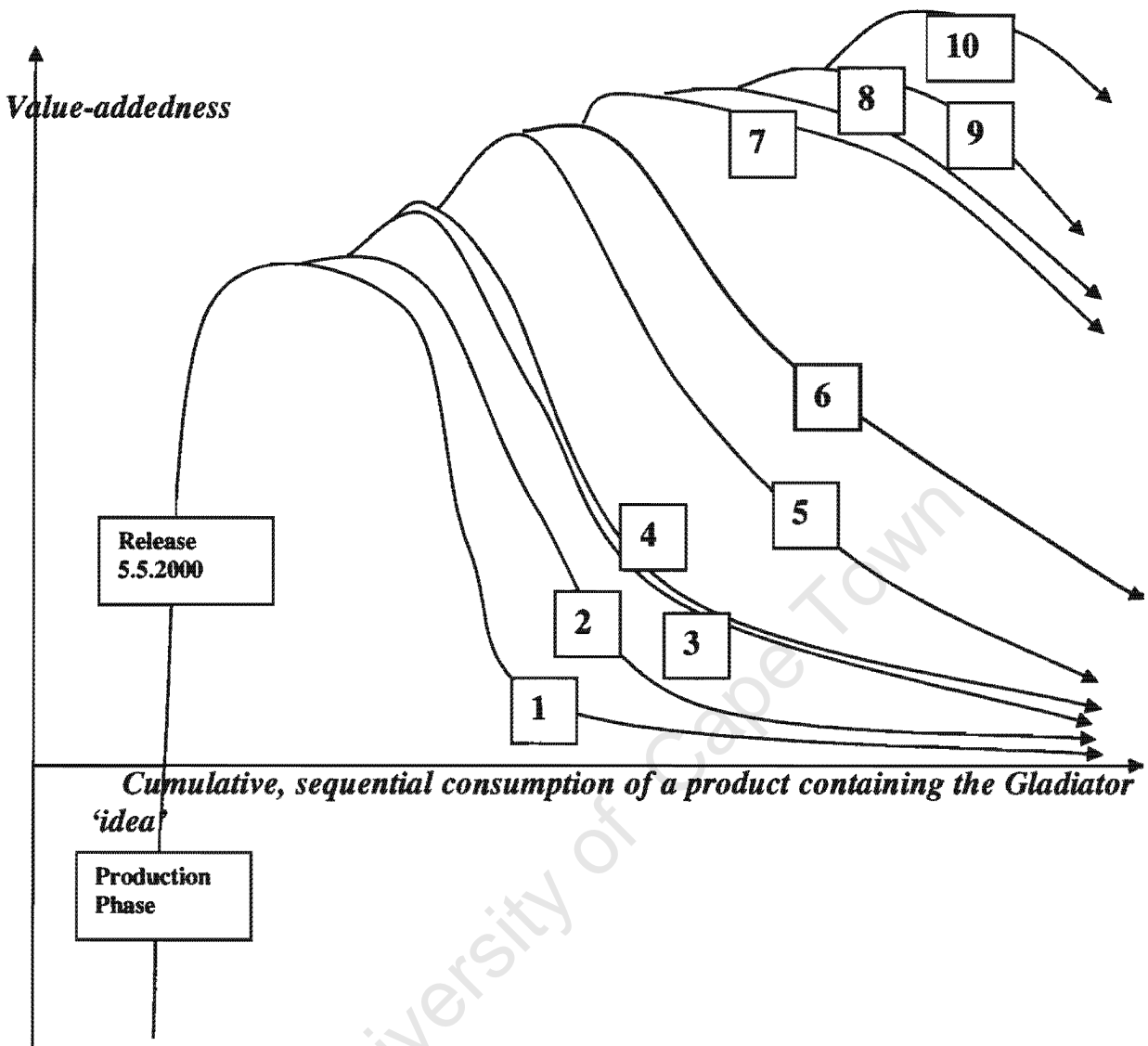
A2. It is not an easy proposition. Aside from the idea of continual upgrading of a product through innovation, if anyone has discovered a new formula, it is probably Hollywood. In a model epitomised (if not pioneered) by Disney, the idea of co-branding and franchising products around an original idea, *an idea that can be copyrighted*, can extend an original concept’s lifecycle. To quote Krugman, ‘*Creations must make money indirectly by promoting sales of something else.*’⁴⁶⁶

The following stylised chart would summarize the lifecycle of the film that won the 2001 Oscar for Best Picture: *Gladiator*.⁴⁶⁷

⁴⁶⁵ This has some fascinating – and largely negative – implications for stock valuations not addressed here.

⁴⁶⁶ Krugman P. 29.9.1996, *Getting Ahead: White Collars Turn Blue*, *New York Times*

⁴⁶⁷ This section relies heavily on the class notes of Professor Baldasty at the University of Washington found at <http://courses.washington.edu/cmuwi01/Jan16MovieBiz.htm>



Gladiator cost \$104 million to make⁴⁶⁸. *Gladiator* was released on 5.5.2000; to date (20.10.2001), it has earned over \$450 million in its worldwide box office take.⁴⁶⁹ The product family born of *Gladiator* is illustrated in the diagram above, the key to which is as follows:

1. The box office sales, both US and foreign
2. The limited release to non-movie house customers e.g. airlines

⁴⁶⁸ www.about.com

3. The Soundtrack Release on CD/Tape
4. The Book of the Film
5. The limited rental Video Release (Tape and DVD)
6. Pay per view TV channels
7. The mass market release DVD/ Video Tape
8. The *Gladiator* II Soundtrack Release
9. The Post Oscar Imax Release
10. The TV rebroadcast rights: premium cable and then network.

The profits from spin-off products subsequent to the box office takings can be very significant, perhaps larger than the original product, which can be regarded as required to cover the heavy costs of such a project. (*Gladiator* had very little associated branded merchandising as compared to say *The Lion King* – this ‘product’ ultimately made Disney a *profit* of \$1bn.⁴⁷⁰) *Gladiator*’s DVD is the most successful in history with 5.5million thus far sold⁴⁷¹; assuming a weighted average retail price of \$30 and a net profit of \$18 to Dreamworks/Universal, the DVD alone has recouped the film’s \$104m production costs.

The length of time required for an investment to recoup its costs, though still an essential consideration, is not as extended as perhaps it used to be – within a year of release, *Gladiator* has cleared, time adjusted, profits in excess of 200% of its original cost.

⁴⁶⁹ www.worldwideboxoffice.com

⁴⁷⁰ <http://courses.washington.edu/cmuwi01/Jan16MovieBiz.htm>

⁴⁷¹ <http://music.cnet.com/investor/news/newsitem/0-9900-1028-7484898-0.html>

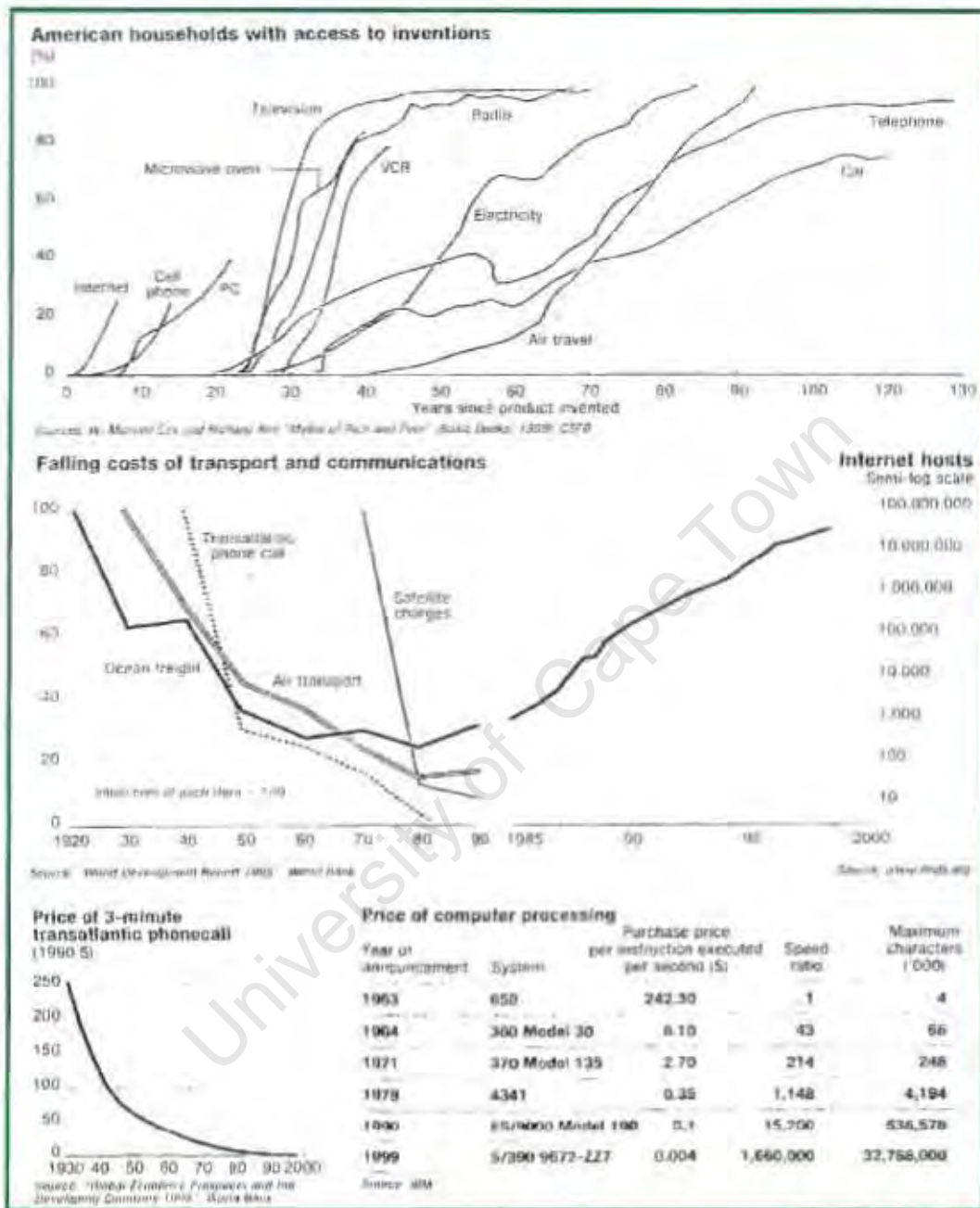
Q3. Why is the PLC's duration shortening?

A3. The mobility of intellectual property upon which the value of so many modern products is based is extremely high. In a sense, the more recent manifestations of intellectual property have even 'mobilised' the basic factors of land, labour and capital machinery. Take for example the impact of modern communications on software writing: high-cost Californian programmers located in Silicon Valley must now compete directly with lower-cost Indian programmers located 12,000 miles away in Hyderabad ('Cyberbad').⁴⁷²

This increase in factor mobility allows for know-how to be 'known how' much more quickly. Unless the law that protects that knowledge is enforced, what value a piece of knowledge has may need to be captured by the 'author' almost overnight; if not, it will quickly be classified as 'yesterday's news', with little residual value-addedness left in its reproduction.

⁴⁷² One could make this point slightly differently without contradicting it – the 'commodity' end of programming is now being outsourced to India whereas the higher value-added activities are still being carried out in California!

6 b) The PLC speeds up – five charts from the Financial Times⁴⁷³



*In the US, it took 46 years for electricity to be taken up by 25% of the population, 35 years for the telephone, 16 years for the PC and 7 years for the World Wide Web.*⁴⁷⁴

⁴⁷³ Financial Times, January, 2000; individual data sources cited on chart

⁴⁷⁴ Nature, 4.11.1999

Comments on the five charts on the previous page

Chart 1: American households with access to innovations.

Though the process is not uniform, there is clear evidence of quicker penetration of new products in the late 20th Century as compared to those introduced in the earlier part of the 20th Century.

Chart 2: Falling costs of transport and communications.

Allied to the above, costs borne by the consumer are falling more quickly the more recent the introduction of the communication service. The implication is that either marginal costs are being passed on to the consumer more quickly (thereby giving the first mover a cost-based advantage as a barrier to new entrants) or competition has forced such reductions (clearly a strong contributing factor in the market for mobile telephony) or, most probably, a combination of both.

Chart 3: Internet hosts.

The growth of Internet host sites has been extremely rapid (*n.b. the scale is semi-log.*) The knock-on effects of this on the PLCs of other products have only been partially reflected in the decline in pricing power now being experienced by suppliers as varied as CD retailers, travel agencies and toyshops.

Chart 4: Price of a 3-minute transatlantic telephone call.

Though there is no comparison against which to pit the relative decline in the cost of a transatlantic phone call, this chart illustrates the claim made herein that occasionally even the *nominal* price of the same good or service can decline over time.

Chart 5: Price of computer processing.

This chart amply shows the impact of improving technology – costs falling sharply or, looking at it a different way, efficiency rising sharply. This chart also illustrates the practical manifestation of Moore's Law – that the number of transistors able to be built on a single chip will double every 18 months.

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6 c) The Origin of Corporate Value Creation

The characteristics that help determine a firm's market worth⁴²⁵ centre on its ability to produce a good or service that:

1. is in scarce supply relative to effective demand
2. is needed 'now' by a significant number of consumers
3. can be afforded by a significant number of consumers
4. can achieve a higher than average sales growth rate
5. is differentiated rather than homogenous
6. is difficult to substitute
7. is produced efficiently, yielding a healthy profit margin to its producer
8. has a high degree of price inelasticity of demand
9. few other firms produce
10. allows the firm to have a relatively attractive risk profile in the capital markets and so a lower than average cost of capital.

In combination, the above attributes would tend to give a firm *pricing power* that could be turned into value-addedness from which healthy profits would result. This would then permit a good return on equity capital employed, allowing the firm to regenerate its capital gene endowment.

The above-listed 'alignment of the planets' would tend to increase the market capitalization of a company as investors bought into its continuing ability to generate value-addedness. In this latter respect – where fresh investment capital chooses to flow – the specific origin of value creation again needs to be

highlighted: *capital is productively used if it is put in a corporate structure that creates more value than it destroys.*

The evolution of corporate value (as measured in US dollars, increasingly the default *numéraire* for global capital) will therefore tend to reflect the capital market's ongoing perception of a firm's ability to generate future value-addedness.

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¹⁷⁵ Again, for clarity's sake, 'worth' is the financial number attributed by a stockmarket to the value creating efforts of a given company.

