

# **Economics Working Paper 123**

# The Impact of Post Industrial Society on the Accounting Compromise – Experience in the UK and Spain

Oriol Amat\* and John Blake† July 1995

Keywords: Accounting, accounting compromise, intangible agents.

Journal of Economic Literature classification: M41.

<sup>\*</sup> Universitat Pompeu Fabra.

<sup>&</sup>lt;sup>†</sup>University of Central Lancashire.

# Abstract

In this article we identify the implications of the 'post-industrial society' for what has been termed the 'accounting compromise', being the basis of traditional accruals based accounting.

The impact of post industrial society on the accounting compromise - experience in the UK and Spain.

In this article we identify the implications of the 'post-industrial society' for what has been termed the 'accounting compromise', being the basis of traditional accruals based accounting.

Below we argue that a series of aspects of the post industrial society put a strain on this 'compromise'.

- a) The assets of a business in a post industrial society are less easily identified by 'accrual' accounting. This is because the investment in the 'intangible assets' that arise from the investment in services does not normally arise from a single identifiable payment in the same way as is common with the 'tangible assets', such as land and buildings and plant, that are the mainstay of a traditional manufacturing process.
- b) Post industrial society gives rise to the expansion of two major liabilities of the business, pension commitments and environmental obligations, that need to be reported if the accounts are meaningful yet are subject to considerable difficulties in estimation.
- c) The combined effect of a diminution of measurable assets and an expansion of liabilities diminishes the apparent net worth of the business, giving rise to a series of expedients by accountants to boost this figure.
- d) The diminished credibility of the 'accounting compromise' leads to an increased demand for information of a different kind both past cash flow data and estimates of discounted future cash flows.

We observe that these trends are clearly established in the UK and detect some indication that they are beginning to emerge in Spain.

# The post industrial society

The American Sociologist Daniel Bell has constructed an elaborate exercise in social forecasting around the concept of the 'post-industrial society'. Bell (1974) identifies five dimensions to this term:

1) The change from a goods producing to a service economy.

A traditional analysis divides the economy into three sectors:

- a) The 'primary' sector, based on natural resources such as agriculture, mining, fishing, and forestry.
- b) The 'secondary' sector being manufacturing or industrial.
- c) The 'tertiary' sector, being services.

As an economy progresses from the 'primary' to the 'secondary' sector increasing affluence leads to an increased demand for services. This demand moves from low value services based on cheap labour, such as household servants, to include higher value services such as those that support business and high skill areas such as health and education. Bell identifies the USA as the first 'service economy' in which the service sector accounts for more than half of total employment and more than half of Gross National Product (GNP).

2) The second dimension of the post industrial society is a shift in occupational distribution. Within industrial society the semi-skilled worker, trained within a few weeks to perform a simple routine with a machine, is the largest single category in the work force. By contrast:

"The expansion of the service economy, with its emphasis on office work, education, and government, has naturally brought about a shift to white-collar occupations". (Bell 1974, p 17).

Bell notes in the USA the growth of the professional and technical class as a whole and the growth rate for scientists and engineers in particular.

The primacy of theoretical knowledge. Bell argues that for "all modes of knowledge: the advances in a field become increasingly dependent on the primary of theoretical work, which codifies what is known and points the way the empirical confirmation. In effect, theoretical knowledge increasingly becomes the strategic resource, the axial principle, of a society" (Bell 1974 p 26).

Bell offers a range of examples to illustrate this proposition. To give just one, he cites the emergence of large econometric models of the economy, with computers providing bridge between a formal body of economic theory and large data bases.

- 4) The planning of technology. With the ability to employ new modes of forecasting post industrial societies will have the ability to plan and control technological growth. The specific example given by Bell is the ability to control the environmental impact of new technology.
- The rise of a new 'intellectual technology'. The distinctive feature of this concept is "to define rational action and to identify the means of achieving it" (Bell 1974, p 30). It is argued that new technology makes it possible to allow in decision making for the interation of a range of variables that would be too wide for the mind to hold in correct order.

Each of these five dimensions can be seen as building on the previous one, as shown in figure 1. At the basic levels of observing the move to a service economy and the consequent growth of a professional and technical class the concept of post industrial society is demonstrable by reference to statistics on gross national product and employment statistics. At the higher level, moving to the development of new concepts of social organisation, Bell's vision is necessarily more speculative.

# Figure 1

The five dimensions of post industrial society.

A new 'intellectual technology'

Ability to plan technology

Primacy of theoretical knowledge

Growth of professional and technical class

Move to a service economy

Figure 2 shows some statistics for the percentage of GNP from Services and the percentage of the population employed in Services in Spain, the UK, and the USA. We can see that as early as 1960 both these figures comfortably exceed 50% for the USA. By 1970 the same is true for the UK but Spain only achieves over 50% employment in services more recently, between 1980 and 1990.

Spain can be said to have entered the 'post industrial society' recently, compared to the UK which has been in this position for some 25 years. Thus we would expect to find effects of the post industrial society that are well established in the UK at an earlier stage of emergence in Spain.

Figure 2

Wage of population employed in Services	JIK USA 47.6 56.2	52.0	ı	5.6.7	ı		
	Spain 30.1	37.2	1	45.1	i	ľ	54.8
hage of GNP from Services	USA 57.7	î.	63.3	ı	66.3	0.89	67.1
	<u>UK</u> 53.8		0.09	•	62.4	65.0	63.2
<b>%</b>	Spain 45.6		52.7	•	55.8	55.9	57.0
	0961	0261	1761	1980	1983	1987	0661

(Source - Caixa d'Estalvis i Pensions de Barcelona 1993" Els Serveis a Espanya: Situació i tendències" Document de Treball num. 29/93).

In this paper we argue the relevance of the concept of 'post industrial society' to understanding certain strains upon the traditional framework of the accounting system that are becoming increasingly apparent in the UK and are just emerging in Spain.

# The Accounting Compromise

# Edey (1971) observes that:

"Accrual accounting is in fact an uneasy compromise between a wholly objective record of past cash receipts and payments, and a wholly subjective assessment of the current value of the enterprise, based on peering into the future". (p441).

Edey discusses the merits of each of the extreme positions. Cash flow reporting has the merits of simplicity, of being capable of precise measurement, and of verifiability. For the old merchant venturers who invested in a ship or cargo and, if and when it returned, sold both ship and cargo and divided the proceeds, this was a satisfactory system. Since the money 'was likely to be in gold or silver coin' there was not even an inflation accounting problem! The real problems of accounting start with the 'annual carve-up', and the necessity to prepare a Balance Sheet.

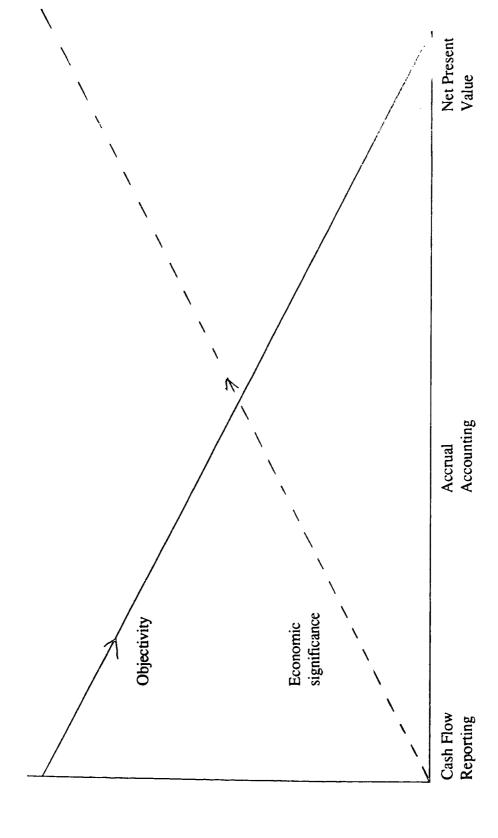
Then a view of the future has to be taken. A 'magnificently simple' balance sheet could be achieved by drawing up a budget showing expected future cash flows to the shareholders and discounting these to net present value giving a balance sheet value of the enterprise. While this is an appropriate exercise for share valuation, the dependence on management's guesses and estimates means that it fails to provide an objective basis for stewardship.

Accrual accounting is therefore seen as 'an uneasy compromise' between these two extremes. Rooted in actual transactions, and therefore drawing heavily on the record of past cash flows, the statement of asset and liability values nevertheless involves taking a 'view of the future'.

The range of management judgement is limited by applying 'rules of the game' on a 'prudent and conservative' basis.

Figure 3 attempts to express this concept of the accounting compromise in diagrammatic form. On the left a simple list of past cash flows is highly objective but, failing to take into account future expectations, has a low economic significance. On the right a computation of the net present value of future cash flows is highly meaningful as an estimate of economic value, but lacks objectivity.

Figure 3 The accounting compromise



It is interesting to observe that in a recent work Edey has returned to this theme observing 'financial statements are a <u>working compromise</u>, far from perfect and capable of improvement, but not to be blamed for failing to do what they were not developed to do and indeed could not do'. (Edey 1993 p 8).

# The asset problem

Block (1990) offers a range of examples, drawn mainly from the USA, where investment in tangible assets has reduced in the post industrial society. He cites:

- a) An official annual price decline for computers of 14% from 1972 to 1984 (p 138), a fall which Block argues is probably underestimated.
- b) The increased capacity of computer numerically controlled machines has increased productivity by an average multiple of 3 (p 143).
- c) Flexible manufacturing systems 'dramatically reduce' the investment required in plant and equipment (p 144).
- d) New manufacturing technologies reduce the amount of space needed in land and buildings he cites cuts in factory production space:
  - i) From 51000 to 9000 square feet. (IBM).
  - ii) From 125,000 to 52,000 square feet (J Westinghouse).
  - iii) From 16500 to 6600 square metres (an unnamed Japanese Factory) (p 144).

Similarly a combination of new technology and management techniques has reduced inventory levels through 'Just-in-Time'.

The problem for the accountant is that these shrinking tangible assets are the relatively easy ones to measure. For a tangible fixed asset depreciation can be computed if two estimates of future events need to be made, the expected period of useful life and the expected disposal receipt or expense. For inventory the known figure of cost must be compared with the estimated selling price, which often will be known by the time accounts are prepared. By contrast, insofar as it is acceptable to account for the intangible assets that assume growing importance in post industrial society a wide range of predictions must be made. In the UK an accounting standard, SSAP13, allows a company to show the costs of development expenditure as an intangible asset. SSAP 13 includes the following forecasts that must be made before this may be done:

- a) The outcome must be "assessed with reasonable certainty as to:
  - i) its technical feasibility, and
  - ii) its ultimate commercial viability considered in the light of factors such as likely market conditions (including competing products), public opinion, consumer and environmental legislation.
- b) It should be "reasonably expected" that future revenues will cover all costs of the project.
- c) There must be adequate resources existing or 'reasonably expected to be available' to carry out the project and support consequent working capital needs.

# Research and Development - a recognised intangible

The accounting rules on research and development (R & D) offer an instructive, and well researched, example of the problems that accountants face when confronted with intangible assets. In the UK the initial proposal of the accounting profession was to require write-off of all such costs. The change to permitting a deferral approach for development expenditure appears to have come in response to defence contractors concerned at the impact that a write-off requirement would have on the reported capital invested in defence projects on which returns allowed for in government defence contracts are computed.

Two issues of public policy support the case for permitting capitalisation of R & D, contrary to the conservative instincts of accountants.

- a) The possible reluctance of institutions to finance investment not visible in the balance sheet.
- b) The possibility that managers will cut back on R & D spending if this cannot be carried forward against future related profits.

A study in the USA throws light on the first issue.

McGee (1984) constructed financial data for two companies. This data was identical except that one capitalised software development costs and other applied a write off policy. The data was then sent to bank loan officers who were asked various questions as to which company they would grant a loan and at what interest rate. For each question the company with the capitalised development costs attracted the more positive response.

On the second issue, how managers react to a requirement to write off R & D expenditure, a number of studies in the USA followed the issue of FAS2, which prescribed the write off method, during the 1970's. Previously a deferral approach had been permitted.

Horwitz and Kolodny (1980, 1981) report on a comparison of firms which had been forced to change from a deferral policy with firms which had always chosen a write off policy. They found that R & D expenditure declined for the 'deferral' firms compared to the 'write-off firms' following the issue of FAS2. A questionnaire to chief financial officer confirmed that some reductions in R & D expenditure were attributable to the new 'write-off' rule. They conclude:

"The evidence supports the premise that the expense-only rule caused a relative decline in R & D outlays for small high-technology firms which had previously used the deferral method of measurement". (Horwitz & Kolodny 1980 p 62).

Similar empirical testing in the UK has not been practical, since the UK accounting standard on research and development, SSAP 13, permits deferral. However, in a survey of UK managers Lothian and Fisher (1988) report that:

"The insistence on immediate write-off with the consequent impact on bottom line may militate against investment" (p 14).

Overall, therefore, the evidence indicates that if firms are forced to write off research and development expenditure this tends to cause managers to reduce such investment.

The experience of accounting for R & D, therefore, is that failure to account for this key intangible asset can have negative economic consequences. In Spain, as in the UK, capitalisation of Research and Development is permitted but with a provision that this asset must be excluded from the accounts in the computation of permitted levels of dividend distribution. Thus, within the framework of Spanish accounting law, recognition of this intangible asset has been half hearted.

# Brands - the emerging intangible

In the late 1980's a number of UK companies began to show another intangible asset on their Balance Sheet, the value of their brand names. In most cases this has arisen only where another company has been acquired, when the value of brands in the acquired company has been separately identified in the consolidated accounts. Generally this asset has not been depreciated on the grounds that brand values can maintain their value indefinitely often this contention is supported by annual reviews of brand valuations.

Accounting regulators in the UK have indicated a preference for not identifying brand valuations separately, so that instead on acquisition of a business the brands will form part of the 'goodwill' figure, being the difference between the price paid for the business and the fair value of the identifiable assets acquired. This approach is unattractive to many companies because Goodwill is subject either to immediate write off or systematic amortisation through the profit and loss account. Table 1 shows the size of the brand valuation intangible asset in the accounts of seven UK companies. In the majority of cases the maintenance of a respectable figure for equity is dependent on being able to continue to show brands as an asset.

Table 1
Significance of the Brands figure in the accounts

	Year End	Brands	Total Assets	Equity	Brands Total Assets	Brands: Equity
		£m	£m	£m		
Cadbury Schweppes	1.1.94	545.8	3266.9	1206.2	17%	45%
	<u></u>		<u> </u>			
Daily Mail	3.10.93	177.1	915.8	404.5	19%	44%
						<u> </u>
Grand Metropolitan	30.9.92	2492	9363	3759	27%	66%
Colored	21 12 02	1205	8019	3729	17%	37%
Guiness	31.12.93	1395	8019	3129	11770	3770
Ladbroke	31.12.92	376.7	4634.7	2512.8	8%	15%
United Biscuits	1.1.94	216.6	1932.3	745.3	11%	29%
Onited Discussion	4.4.7	210.0	1752.5	1	<u> </u>	
United Newspapers	31.12.92	138	712	167	19%	83%

Cooper and Carey (1989) reflect a widely held view among accountants when they argue:

"there have been very few reported cases of self-generated or similar intangibles being recognised, and there now appears to be broad acceptance that they should not be".

A notable exception to this view was provided by Rank Hovis McDougall (RHM) which, in the 1988 accounts, first capitalised some £678 million of brands representing 59% of total assets. (see Arnold & Sherer 1989). Self generated as well as acquired brands were included.

The technical process of brand valuation, involving both marketing and finance skills, has created a new service industry in its own right. In a paper reviewing brand valuation approaches Osburn (1989) observes:

"The appraisal profession has developed a number of useful concepts, such as 'premise of value' and comprehensive valuation methodologies, which have remained largely unknown by the rest of the accounting profession" (p 48).

Concern with the qualifications of the accounting profession in this area has been articulated by the managing director of Interbrand UK: "many professional firms of accountants who only a year ago were vehemently opposed to the brand accounting initiative have now set up their own brand valuation divisions. Why should they stop at brands? We are told that office cleaning and chiropody are boom areas. It seems that accountancy practices can turn their talents to anything". (Stobart 1990).

In Spain, by contrast, there has not been any indication either of companies identifying brand valuations separately on acquisition of a subsidiary or valuation of a company's internally created brands. Brands only appear on Spanish company balance sheets when they are the subject of a specific purchase.

# Liabilities

Traditionally the liabilities of a business have been relatively easy to measure in the accruals based accounting framework; a specific amount of money borrowed in the past gives rise to an obligation to repay a specified amount in the future. In the post industrial society, however, two liabilities which are considerably more difficult to measure become significant.

One is the liability to pay pensions, a growing item with the increase in the white collar workforce and the desirability of locking in the intellectual capital of the company.

As Loeb (1987) observes, current demographic trends add to the importance of this issue. In the UK an accounting standard, SSAP 24, addresses this problem. For a defined benefit scheme, where employers are promised a pension on the basis of some defined benefit and the scheme is then funded accordingly, the standard identifies the following assumptions which an actuary must make in valuing the total pension obligation:

- a) Future rates of inflation and pay rises.
- b) Increased to pension payments.
- c) Earnings on investments
- d) Number of employees joining the scheme.
- e) The age profile of employees.
- f) The probability that employees will die or leave the company's employment before they reach retiring age.

Such an actuarial valuation may reveal a considerable difference between the accumulated pension fund, based on employer and employee contributions, and the estimated liability. In recent years UK companies have tended to show large surpluses of pension fund assets over the actuarially valued liability. Derwent (1994) argues: "large surpluses have arisen, due in part to strong investment performance and low inflation and in part to lower than expected preserved pension costs resulting from widespread redundancy programmes. As these trends may be reversed, one year's surplus could become the following year's deficit".

As an example of the potential for major fluctuations, Derwent cites the change in the British Telecom accounts from a £1740m surplus in 1990 to a £750m deficit in 1993.

Thus UK industry has not, generally, been faced with a major liability arising from the accounting rules in SSAP 24; indeed, those rules have given opportunities to boost company reported income and assets. Changes in economic trends could expose UK companies to similar reported losses and liabilities in the future.

It is interesting to contrast the position in the UK, with a full actuarial valuation of the pension obligation, to that in Germany. There only legally binding pension obligations entered into by the company itself must be accrued for, not those entered into via the company welfare fund even though the labour courts have held these to be enforceable against the company itself. Moreover German law limits the scope of actuarial estimates to exclude accounts for employees under the age of 30 and to disregard future payroll increases (see Seckler 1992 p 239). Traditionally the German approach to accounting with its reluctance to permit valuation and its restriction on future estimates, has tended to conservation. In this case the effect is the reverse.

In Spain it has only been as recently as 1990 that accounting law has required companies to include the pension liability in their accounts. Moreover, to avoid too dramatic an impact on the accounts companies have been given the following time periods to accumulate provision for the full actuarial liability for pensions:

Employees still working 15 years Retired employees 7 years

Thus in Spain the significance of this item is set to grow steadily over coming years, unlike the UK where fluctuations in the trend of actuarial estimates and investment performance have the potential to create more sudden swings.

The second liability arises out of the increasing environmental awareness, and consequent legislation, that is part of the character of post industrial society. Tinker (1985) reviews one case, that case of Hoover Chemical, an Occidental Petroleum subsidiary. From 1930 to 1953 the company used the Love canal, near Niagara Falls, as a dump for a range of highly toxic chemicals. The canal was then covered in. In the late 1970's evidence accumulated that the polluted site was to blame for a range of medical problems for local residents, including a horrifying range of birth defects. Hundreds of homes had to be evacuated and destroyed. Only in 1980 did Occidental Petroleum face a requirement to accrue in the accounts for the consequent spate of legal claims, with the SEC observing:

"The total cost of compliance with environmental regulations includes not only those costs of bringing facilities into full compliance with environmental regulations, but also costs associated with past non-compliance with environmental regulations" (Tinker 1985, p 4).

#### As Tinker observes:

"Retrospectively, the costs associated with Love canal began to accumulate when the company poured toxic waste into the canal in the 1930's, and hence should have been matched against the revenues for that period" (p 8).

The case highlights the problem of accounting for costs arising from environmental pollution, with a need here to foresee consequences 50 years ahead in a context where it had become increasingly common to trace back the consequences of pollution to the polluter. Tozer (1992) identifies legislation in Canada, the USA, the UK, and New Zealand that substantially increases company responsibility for rectifying past and present pollution. Awareness of the importance of potential environmental liabilities is evidenced by the response of banks in the USA, where a loan secured on land that proves to be contaminated may, because of the costs of rectification, become 'virtually unsecured' (Bunker 1990 p 14). Two surveys showed banks' increasing awareness of this risk; in 1987, a survey showed that about a third of banks' used environmental audits before accepting property as security, while a similar survey in 1989 showed 39 out of 41 banks regularly using such audits and the other 2 using them in special cases (Commins 1990 p 14).

A recent survey of environmental reporting by UK companies reports that, while much disclosure is current unquantified:

"Direct investors, takeover bidders and bank lenders are increasingly aware of the need to ascertain whether potential responsibilities for environmental liabilities are lurking within the companies with which they become involved". (Butler et al 1992 p 55).

In a discussion of accounting for environmental liabilities in Spain Elorriaga Ancin (1993) identifies the liability for environmental damage as one that is difficult to quantify in the accounts, while arguing that both companies and auditors should be more sensitive to this issue.

# The expansion of creative accounting

Paton (1922) offered one of the earliest analyses of the basic postulates that underlie accounting. Much of what he said has been absorbed into subsequent analyses of accounting conventions. In discussing the basic accounting equation, that the owner's equity in a business is equal to the assets less the liabilities, he makes the following observation:

"there are certain situations outside the business enterprise which do not present an equation of assets and equities in the ordinary sense". Paton offers two examples. One is that of governments which may owe amounts in excess of their assets but, with the power to tax, can generate future cash flows to meet their obligations. The other is that of the college student who "may have liabilities galore but no assets in the usual sense. Yet his creditors may consider him perfectly good" (Paton 1922 p 485).

Paton saw this situation, where the ability to generate future cash flows is not measurable as an asset, as arising "outside the business enterprise". Arguably, in the post industrial society, with diminishing measurable assets and expanding identifiable liabilities, this situation may arise <u>inside</u> the business enterprise.

We have seen how business managing major brands have found it necessary to put these on the Balance Sheet to boost their equity to respectable levels. In recent years the growth of 'creative accounting' has attracted considerable comment in the UK. Naser and Pendlebury (1992) report on a survey of company auditors on the reasons why they believe their clients engage in creative accounting. The percentage who 'strongly agree' or 'agree' with the following reasons were:

	%
To meet limits on borrowing levels and gearing ratios	80.9
Desire to reduce taxation	63.7
Desire to control dividends	22.7
Pressure from big institutional investors	22.7
(adapted from Naser and Pendlebury 1992 p 114).	

In UK Company Articles of Association it is common to find company borrowing powers expressed as a multiple of the equity reported in the accounts; these restrictions are often articulated in a similar way in agreements with lenders. Thus company powers to raise finance from borrowing are dependent on the difference between total assets and total liabilities as reported in the accounts. It is interesting to observe that 45.5% of auditors "strongly agree" or "agree" that "the use of creative accounting is considered to be a legitimate business tool" (Naser & Pendlebury 1992 p 116). In this context creative accounting may be seen as a defensive device in response to the pressures arising from the breakdown of the "accounting compromise".

Whereas the phenomenon of 'creative accounting' is well established in the UK, the expression has only recently appeared in the Spanish literature (see Rojo Ramirez 1993).

# Moving to the edges of the Spectrum

We have seen that Edey identifies accruals based accounting as a compromise between a presentation of past cash flows and computing the present value of estimated future cash flows. It is interesting to observe, and perhaps indicative of the break down of the 'compromise', that both approaches have a growing place in the financial statements in the UK, though not in Spain.

Accounting regulators have brought in requirements for cash flow statements in recent years in New Zealand (1987), the USA (1987) the UK (1991) and Australia (1992). Advocates argue that the cash flow statement avoids the elements of judgement and subjectivity inherent in accrual accounting. Thus Lee (1992) argues that the cash flow statement: "is devoid of the effects of periodic accounting accruals and cost allocations. It represents the observable effects of economic transactions, and can therefore be said to be a statement entirely of economic substance and free of legal form".

Neill et al (1991 p 118) cite a number of authorities who have identified significant manipulation by management of accrual based accounting as grounds for preferring cash flow based information.

In Spain the 1990 General Accounting Plan requires a funds flow statement, explaining changes between the opening and closing balance sheet, rather than a cash flow statement. However there has been some argument in Spain for moving to the cash flow approach (see Iglesias 1992).

As recently as 1980 the UK Accounting Standards Committee, in the Guidance Notes to SSAP16, asserted that:

"In historic cost accounts it is not usual to discount the future cash flows" (see Clayton & Blake 1984 p 23).

By contrast Lovejoy et al (1989) report:

- i) A number of UK accounting requirements that explicitly prescribe discounting future cash flows, such as SSAP 21 on leasing and SSAP 24 on pension costs.
- ii) Use made by companies of discounted cash flow techniques for a number of financial accounting purposes, such as the estimation of the fair value of the assets of an acquired subsidiary.

In Spain, on the otherhand, it is not normal for discounted cash flow technique to play any part in arriving at the balance sheet figures.

#### Conclusion

The framework for social forecasting embodied in the concept of 'post industrial society' is consistent with a number of trends which have undermined the traditional accounting framework in the UK and are just emerging in Spain, consistent with Spain's more recent development to a post industrial economy.

A number of implications may be seen as arising from the threat to the traditional accounting framework posed by current social and economic trends:

- 1) The U.K. situation is likely to become increasingly difficult, since the two liabilities for pension obligations and environmental responsibilities are both set to grow in significance; in Spain, it is the growth of the pension obligation that is more imminent.
- 2) Different countries are likely to respond to these pressures in different ways, both because of different stages in moving to post industrialism and different accounting philosophies. In our example, the UK needs to address this situation with more urgency than Spain.
- The accountant will become increasingly dependent on other areas of expertise to evaluate future uncertainties. In the examples considered above we have seen the need for scientists to assess both the technical viability of development projects and the implications of past and present pollution, marketing experts to value brands, and actuaries to assess pension liabilities.
- 4) If the accounting regulators refuse to allow the inclusion of the increasingly importance intangible assets on the balance sheet because of the major inherent uncertainties involved then accounts will decline in relevance, while if those assets are recognised then there will be some less in reliability.
- 5) Research into methods for valuing intangible assets is of growing importance in the post industrial society.

• (17)

### References

Arnold T. & Sherer M. 1989

"Valuation of brands: the RHM approach" The Accountant's Magazine, March, p 43.

Bell D. 1974

"The coming of post industrial society" London: Heinemann

Block F. 1990

"Post-industrial possibilities"

University of California Press

Bunker E. M. 1990

"Coming to terms with asbestos" Journal of Commercial bank lending, April, pp 12-19.

Butler D., Frost C., & Macue R. 1992

"Environmental Reporting" in Skerratt LCL & Tonkin DJ

"Financial Reporting 1991-92: A Survey of UK Reporting Practice" London: Institute of Chartered Accountants in England and Wales.

Clayton P. & Blake J. 1984

"Inflation Accounting" London: Longman

Commins J. A. 1990

"Environmental audits revisited" Journal of Commercial Bank Lending, May, pp 13-17.

Cooper M. & Carey A. 1989

"Brand Valuation in the Balance", Accountancy, July p 28.

Derwent R. A. 1994

"Pension Costs" in Skerratt LCL and Tonkin D.J. "Financial Reporting 1993-1994: A Survey of UK reporting practice".

London: Institute of Chartered Accountants in England and Wales.

Edey H. 1971

"The true and fair view" Accountancy, August, pp 440-441.

Edey H. 1993

"Understanding Financial Reporting" London: Institute of Chartered Accountants in England and Wales.

Elorriaga Ancin J. F. 1993

"El coste de la operatividad de la gestión medio ambiental en la empresa" in Castello Taliani E. "Nuevas Tendencias en contabilidad de Gestión" Madrid: AECA.

Ayo,.. (18)

# Horwitz B. N. & Kolodny R. 1980

"The economic effects of involuntary uniformity in the financial reporting of R & D expenditures" Journal of Accounting Research, Supplement, pp 38-74.

### Horwitz B. N. & Kolodny R. 1981

"The FASB, the SEC, and R & D" Bell Journal of Economics, Spring, pp 249-262.

# Iglesias Sanchez J. L. 1992

"Necesidad de incorporar el cash flow a las cuentas anuales del Plan General de Contabilidad" Tecnica Contable, February, pp 83-`104.

#### Lee T. 1992

"Making cash flow statements" Accountancy, April, p 35.

#### Loeb S. E. 1987

"Population aging: some accounting considerations" Journal of Accounting and Public Policy, Fall, pp 157-167.

# Lothian N. & Fisher J. 1988

"R & D: Understanding Corporate Behaviour" Accountants Magazine, June, pp 14-15.

# Lovejoy C., Peaswell K., Taylor P., & Talukdor Y. 1989

"Discounting in corporate financial reporting" London: Institute of Chartered Accountants in England and Wales.

# McGee R. W. 1984

"Software accounting, bank lending decisions, and stockprices" Management Accounting (US), July, pp 20-23.

### Naser K. H. M. & Pendlebury 1992

"A note on the use of creative accounting" British Accounting Review, July, pp 111-118.

# Neill J. D. & Schaefer T. F., Nahnson P. R. & Bradbury M. E., 1991

"The usefulness of cash flow data: A review and synthesis" Journal of accounting literature, 10, pp 117-150.

### Osburn H. J. 1989

"Brand accounting and international business" Multinational Business, No 3, pp 44-48.

### Paton W. 1922

"Accounting Theory" reprinted by Scholars Book Co., 1973.

### Rojo Ramirez A. A. 1993

"Tendencias de la Contabilidad y Contabilidad creativa" Boletín AECA, No 31, p 4-7.

Seckler G. 1992

"Germany" in Alexander B. & Archer S. eds "European Accounting Guide" Academic Press pp 213-277.

Stobart P. 1990

Brands - the way to the yellow brick road?" Accountancy, May, pp 27-28.

Tinker T. 1985

"Paper Prophets" Holt Rinehart & Winston.

Tozer L. 1992

"The accounting implications of the New Zealand Resource Management Act 1991" Accountancy Division Discussion Paper Series No 121, Massey University New Zealand.

#### WORKING PAPERS LIST

1. Albert Marcet and Ramon Marimon

Communication, Commitment and Growth. (June 1991) [Published in Journal of Economic Theory Vol. 58, no. 2, (December 1992)]

2. Antoni Bosch

Economies of Scale, Location, Age and Sex Discrimination in Household Demand. (June 1991) [Published in European Economic Review 35, (1991) 1589-1595]

Albert Satorra

Asymptotic Robust Inferences in the Analysis of Mean and Covariance Structures. (June 1991) [Published in Sociological Methodology (1992), pp. 249-278, P.V. Marsden Edt. Basil Blackwell: Oxford & Cambridge, MA]

4. Javier Andrés and Jaume Garcia

Wage Determination in the Spanish Industry. (June 1991) [Published as "Factores determinantes de los salarios: evidencia para la industria española" in J.J. Dolado et al. (eds.) La industria y el comportamiento de las empresas españolas (Ensayos en homenaje a Gonzalo Mato), Chapter 6, pp. 171-196, Alianza Economia]

5. Albert Marcet

Solving Non-Linear Stochastic Models by Parameterizing Expectations: An Application to Asset Pricing with Production. (July 1991)

6. Albert Marcet

Simulation Analysis of Dynamic Stochastic Models: Applications to Theory and Estimation. (November 1991), 2d. version (March 1993) [Published in Advances in Econometrics invited symposia of the Sixth World Congress of the Econometric Society (Eds. JJ. Laffont i C.A. Sims). Cambridge University Press (1994)]

7. Xavier Calsamiglia and Alan Kirman

A Unique Informationally Efficient and Decentralized Mechanism with Fair Outcomes. (November 1991) [Published in *Econometrica*, vol. 61, 5, pp. 1147-1172 (1993)]

8. Albert Satorra

The Variance Matrix of Sample Second-order Moments in Multivariate Linear Relations. (January 1992) [Published in Statistics & Probability Letters Vol. 15, no. 1, (1992), pp. 63-69]

9. Teresa Garcia-Milà and Therese J. McGuire

Industrial Mix as a Factor in the Growth and Variability of States' Economies. (January 1992) [Forthcoming in Regional Science and Urban Economics]

10. Walter Garcia-Fontes and Hugo Hopenhayn

Entry Restrictions and the Determination of Quality. (February 1992)

11. Guillem López and Adam Robert Wagstaff

Indicadores de Eficiencia en el Sector Hospitalario. (March 1992) [Published in Moneda y Crédito Vol. 196]

12. Daniel Serra and Charles ReVelle

The PQ-Median Problem: Location and Districting of Hierarchical Facilities. Part I (April 1992) [Published in Location Science, Vol. 1, no. 4 (1993)]

13. Daniel Serra and Charles ReVelle

The PQ-Median Problem: Location and Districting of Hierarchical Facilities. Part II: Heuristic Solution Methods. (April 1992) [Published in Location Science, Vol. 2, no. 2 (1994)]

14. Juan Pablo Nicolini

Ruling out Speculative Hyperinflations: a Game Theoretic Approach. (April 1992)

15. Albert Marcet and Thomas J. Sargent

Speed of Convergence of Recursive Least Squares Learning with ARMA Perceptions. (May 1992) [Forthcoming in Learning and Rationality in Economics]

16. Albert Satorra

Multi-Sample Analysis of Moment-Structures: Asymptotic Validity of Inferences Based on Second-Order Moments. (June 1992) [Published in Statistical Modelling and Latent Variables Elsevier, North Holland. K. Haagen, D.J. Bartholomew and M. Deistler (eds.), pp. 283-298.]

Special issue Vernon L. Smith

Experimental Methods in Economics. (June 1992)

17. Albert Marcet and David A. Marshall

Convergence of Approximate Model Solutions to Rational Expectation Equilibria Using the Method of Parameterized Expectations.

18. M. Antònia Monés. Rafael Salas and Eva Ventura

Consumption, Real after Tax Interest Rates and Income Innovations. A Panel Data Analysis. (December 1992)

19. Hugo A. Hopenhayn and Ingrid M. Werner

Information. Liquidity and Asset Trading in a Random Matching Game. (February 1993)

20. Daniel Serra

The Coherent Covering Location Problem. (February 1993) [Forthcoming in Papers in Regional Science]

21. Ramon Marimon, Stephen E. Spear and Shyam Sunder

Expectationally-driven Market Volatility: An Experimental Study. (March 1993) [Forthcoming in Journal of Economic Theory]

22. Giorgia Giovannetti, Albert Marcet and Ramon Marimon

Growth, Capital Flows and Enforcement Constaints: The Case of Africa. (March 1993) [Published in European Economic Review 37, pp. 418-425 (1993)]

23. Ramon Marimon

Adaptive Learning, Evolutionary Dynamics and Equilibrium Selection in Games. (March 1993) [Published in European Economic Review 37 (1993)]

24. Ramon Marimon and Ellen McGrattan

On Adaptive Learning in Strategic Games. (March 1993) [Forthcoming in A. Kirmun and M. Salmon eds. "Learning and Rationality in Economics" Basil Blackwell]

25. Ramon Marimon and Shyam Sunder

Indeterminacy of Equilibria in a Hyperinflationary World: Experimental Evidence. (March 1993) [Forthcoming in Econometrica]

26. Jaume Garcia and José M. Labeaga

A Cross-Section Model with Zeros: an Application to the Demand for Tobacco. (March 1993)

27. Xavier Freixas

Short Term Credit Versus Account Receivable Financing. (March 1993)

28. Massimo Motta and George Norman

Does Economic Integration cause Foreign Direct Investment? (March 1993) [Published in Working Paper University of Edinburgh 1993:1]

29. Jeffrey Prisbrey

An Experimental Analysis of Two-Person Reciprocity Games. (February 1993) [Published in Social Science Working Paper 787 (November 1992)]

30. Hugo A. Hopenhayn and Maria E. Muniagurria

Policy Variability and Economic Growth. (February 1993)

31. Eva Ventura Colera

A Note on Measurement Error and Euler Equations: an Alternative to Log-Linear Approximations. (March 1993) [Published in *Economics Leuers*, 45, pp. 305-308 (1994)]

32. Rafael Crespí i Cladera

Protecciones Anti-Opa y Concentración de la Propiedad: el Poder de Voto. (March 1993)

33. Hugo A. Hopenhayn

The Shakeout. (April 1993)

34. Walter Garcia-Fontes

Price Competition in Segmented Industries. (April 1993)

35. Albert Satorra i Brucart

On the Asymptotic Optimality of Alternative Minimum-Distance Estimators in Linear Latent-Variable Models. (February 1993) [Published in *Econometric Theory*, 10, pp. 867-883]

36. Teresa Garcia-Milà, Therese J. McGuire and Robert H. Porter

The Effect of Public Capital in State-Level Production Functions Reconsidered. (February 1993)

37. Ramon Marimon and Shyam Sunder

Expectations and Learning Under Alternative Monetary Regimes: an Experimental Approach. (May 1993)

38. José M. Labeaga and Angel López

Tax Simulations for Spain with a Flexible Demand System. (May 1993)

39. Daniel Serra and Charles ReVelle

Market Capture by Two Competitors: The Pre-Emptive Location Problem. (May 1993) [Published in *Journal of Regional Science*, Vol. 34, no.4 (1994)]

40. Xavier Cuadras-Morató

Commodity Money in the Presence of Goods of Heterogenous Quality. (July 1993) [Published in Economic Theory 4 (1994)]

41. M. Antònia Monés and Eva Ventura

Saving Decisions and Fiscal Incentives: A Spanish Panel Based Analysis. (July 1993)

42. Wouter J. den Haan and Albert Marcet

Accuracy in Simulations. (September 1993) [Published in Review of Economic Studies, (1994)]

43. Jordi Gali

Local Externalities, Convex Adjustment Costs and Sunspot Equilibria. (September 1993) [Forthcoming in Journal of Economic Theory]

44. Jordi Galí

Monopolistic Competition, Endogenous Markups, and Growth. (September 1993) [Forthcoming in European Economic Review]

45. Jordi Gali

Monopolistic Competition. Business Cycles, and the Composition of Aggregate Demand. (October 1993) [Forthcoming in Journal of Economic Theory]

46. Oriol Amat

The Relationship between Tax Regulations and Financial Accounting: a Comparison of Germany, Spain and the United Kingdom. (November 1993) [Forthcoming in European Management Journal]

47. Diego Rodríguez and Dimitri Vayanos

Decentralization and the Management of Competition. (November 1993)

48. Diego Rodríguez and Thomas M. Stoker

A Regression Test of Semiparametric Index Model Specification. (November 1993)

49. Oriol Amat and John Blake

Control of the Costs of Quality Management: a Review or Current Practice in Spain. (November 1993)

50. Jeffrey E. Prisbrey

A Bounded Rationality, Evolutionary Model for Behavior in Two Person Reciprocity Games. (November 1993)

51. Lisa Beth Tilis

Economic Applications of Genetic Algorithms as a Markov Process. (November 1993)

52. Ángel López

The Comand for Private Transport in Spain: A Microeconometric Approach. (December 1993)

53. Ángel López

An Assessment of the Encuesta Continua de Presupuestos Familiares (1985-89) as a Source of Information for Applied Reseach. (December 1993)

54. Antonio Cabrales

Stochastic Replicator Dynamics. (December 1993)

55. Antonio Cabrales and Takeo Hoshi

Heterogeneous Beliefs, Wealth Accumulation, and Asset Price Dynamics. (February 1993, Revised: June 1993)

56. Juan Pablo Nicolini

More on the Time Inconsistency of Optimal Monetary Policy. (November 1993)

57. Lisa B. Tilis

Income Distribution and Growth: A Re-examination. (December 1993)

58. José María Marín Vigueras and Shinichi Suda

A Model of Financial Markets with Default and The Role of "Ex-ante" Redundant Assets. (January 1994)

59. Angel de la Fuente and José María Marín Vigueras

Innovation, "Bank" Monitoring and Endogenous Financial Development. (January 1994)

60. Jordi Galí

Expectations-Driven Spatial Fluctuations. (January 1994)

61. Josep M. Argilés

Survey on Commercial and Economic Collaboration Between Companies in the EEC and Former Eastern Bloc Countries. (February 1994)

62. German Rojas

Optimal Taxation in a Stochastic Growth Model with Public Capital: Crowding-in Effects and Stabilization Policy. (September 1993)

63. Irasema Alonso

Patterns of Exchange, Fiat Money, and the Welfare Costs of Inflation. (September 1993)

64. Rohit Rahi

Adverse Selection and Security Design. (February 1994)

65. Jordi Galí and Fabrizio Zilibotti

Endogenous Growth and Poverty Traps in a Cournotian Model. (November 1993)

66. Jordi Galí and Richard Clarida

Sources of Real Exchage Rate Fluctuations: How Important are Nominal Shocks?. (October 1993, Revised: January 1994) [Forthcoming in Carnegie-Rochester Conference in Public Policy]

67. John Ireland

A DPP Evaluation of Efficiency Gains from Channel-Manufacturer Cooperation on Case Counts. (February 1994)

68. John Ireland

How Products' Case Volumes Influence Supermarket Shelf Space Allocations and Profits. (February 1994)

69. Fabrizio Zilibotti

Foreign Investments, Enforcement Constraints and Human Capital Accumulation. (February 1994)

70. Vladimir Marianov and Daniel Serra

Probabilistic Maximal Covering Location Models for Congested Systems. (March 1994)

71. Giorgia Giovannetti.

Import Pricing, Domestic Pricing and Market Structure. (August 1993, Revised: January 1994)

72. Raffaela Giordano.

A Model of Inflation and Reputation with Wage Bargaining. (November 1992, Revised March 1994)

73. Jaume Puig i Junoy.

Aspectos Macroeconómicos del Gasto Sanitario en el Proceso de Convergencia Europea. (Enero 1994)

74. Daniel Serra, Samuel Ratick and Charles ReVelle.

The Maximum Capture Problem with Uncertainty (March 1994) [Forthcoming in Environment and Planning B]

75. Oriol Amat, John Blake and Jack Dowds.

Issues in the Use of the Cash Flow Statement-Experience in some Other Countries (March 1994)

76. Albert Marcet and David A. Marshall.

Solving Nonlinear Rational Expectations Models by Parameterized Expectations: Convergence to Stationary Solutions (March 1994)

77. Xavier Sala-i-Martin.

Lecture Notes on Economic Growth (I): Introduction to the Literature and Neoclassical Models (May 1994)

78. Xavier Sala-i-Martin.

Lecture Notes on Economic Growth (II): Five Prototype Models of Endogenous Growth (May 1994)

Xavier Sala-i-Martin.

Cross-Sectional Regressions and the Empirics of Economic Growth (May 1994)

80. Xavier Cuadras-Morató.

Perishable Medium of Exchange (Can Ice Cream be Money?) (May 1994)

81. Esther Martinez García.

Progresividad y Gastos Fiscales en la Imposición Personal sobre la Renta (Mayo 1994)

82. Robert J. Barro, N. Gregory Mankiw and Xavier Sala-i-Martin.

Capital Mobility in Neoclassical Models of Growth (May 1994)

83. Sergi Jiménez-Martin.

The Wage Setting Process in Spain. Is it Really only about Wages? (April 1993, Revised: May 1994)

84. Robert J. Barro and Xavier Sala-i-Martin.

Quality Improvements in Models of Growth (June 1994)

85. Francesco Drudi and Raffaela Giordano.

Optimal Wage Indexation in a Reputational Model of Monetary Policy Credibility (February 1994)

86. Christian Helmenstein and Yury Yegorov.

The Dynamics of Migration in the Presence of Chains (June 1994)

87. Walter García-Fontes and Massimo Motta.

Quality of Professional Services under Price Floors. (June 1994)

88. Jose M. Bailen.

Basic Research, Product Innovation, and Growth. (September 1994)

89. Oriol Amat and John Blake and Julia Clarke.

Bank Financial Analyst's Response to Lease Capitalization in Spain (September 1994) [Forthcoming in *International Journal of Accounting*.]

90. John Blake and Oriol Amat and Julia Clarke.

Management's Response to Finance Lease Capitalization in Spain (September 1994)

91. Antoni Bosch and Shyam Sunder.

Tracking the Invisible Hand: Convergence of Double Auctions to Competitive Equilibrium. (July 1994)

92. Sergi Jiménez-Martin.

The Wage Effect of an Indexation Clause: Evidence from Spanish Manufacturing Firms. (September 1994)

93. Albert Carreras and Xavier Tafunell.

National Enterprise. Spanish Big Manufacturing Firms (1917-1990), between State and Market (September 1994)

94. Ramon Faulí-Oller and Massimo Motta.

Why do Owners let their Managers Pay too much for their Acquisitions? (October 1994)

95. Marc Sáez Zafra and Jorge V. Pérez-Rodríguez.

Modelos Autorregresivos para la Varianza Condicionada Heteroscedástica (ARCH) (October 1994)

96. Daniel Serra and Charles ReVelle.

Competitive Location in Discrete Space (November 1994) [Forthcoming in Zvi Drezner (ed.): Facility Location: a Survey of Applications and Methods. Springer-Verlag New York.

97. Alfonso Gambardella and Walter García-Fontes.

Regional Linkages through European Research Funding (October 1994) [Forthcoming in Economic of Innovation and New Technology]

98. Daron Acemoglu and Fabrizio Zilibotti.

Was Prometheus Unbound by Chance? Risk, Diversification and Growth (November 1994)

99. Thierry Foucault.

Price Formation and Order Placement Strategies in a Dynamic Order Driven Market (June 1994)

100. Ramon Marimon and Fabrizio Zilibotti.

'Actual' versus 'Virtual' Employment in Europe: Why is there Less Employment in Spain? (December 1994)

101. María Sáez Martí.

Are Large Windows Efficient? Evolution of Learning Rules in a Bargaining Model (December 1994)

102. María Sáez Martí.

An Evolutionary Model of Development of a Credit Market (December 1994)

103. Walter García-Fontes and Ruben Tansini and Marcel Vaillant.

Cross-Industry Entry: the Case of a Small Developing Economy (December 1994)

104. Xavier Sala-i-Martin.

Regional Cohesion: Evidence and Theories of Regional Growth and Convergence (October 1994)

105. Antoni Bosch-Domènech and Joaquim Silvestre.

Credit Constraints in General Equilibrium: Experimental Results (December 1994)

106. Casey B. Mulligan and Xavier Sala-i-Martin.

A Labor-Income-Based Measure of the Value of Human Capital: an Application to the States of the United States. (December 1994)

107. José M. Bailén and Luis A. Rivera-Bátiz.

Human Capital, Heterogeneous Agents and Technological Change (March 1995)

108. Xavier Sala-i-Martin.

A Positive Theory of Social Security (February 1995)

109. J. S. Marron and Frederic Udina.

Interactive Local Bandwidth Choice (February 1995)

110. Marc Sáez and Robert M. Kunst.

ARCH Patterns in Cointegrated Systems (March 1995)

111. Xavier Cuadras-Morató and Joan R. Rosés.

Bills of Exchange as Money: Sources of Monetary Supply during the Industrialization in Catalonia (1844-74) (April 1995)

112. Casey B. Mulligan and Xavier Sala-i-Martin.

Measuring Aggregate Human Capital (January 1995)

113. Fabio Canova.

Does Detrending Matter for the Determination of the Reference Cycle and the Selection of Turning Points? (March 1995)

114. Sergiu Hart and Andreu Mas-Colell.

Bargaining and Value (February 1995)

115. Teresa Garcia-Milà, Albert Marcet and Eva Ventura.

Supply Side Interventions and Redistribution (June 1995)

116. Robert J. Barro and Xavier Sala-i-Martin.

Technological Diffusion, Convergence, and Growth (May 1995)

117. Xavier Sala-i-Martin.

The Classical Approach to Convergence Analysis (June 1995)

118. Serguei Maliar and Vitali Perepelitsa.

LCA Solvability of Chain Covering Problem (May 1995)

119. Serguei Maliar, Igor' Kozin and Vitali Perepelitsa.

Solving Capability of LCA (June 1995)

120. Antonio Ciccone and Robert E. Hall.

Productivity and the Density of Economic Activity (May 1995)

- 121. Jan Werner.Arbitrage, Bubbles, and Valuation (April 1995)
- 122. Andrew Scott.
  Why is Consumption so Seasonal? (March 1995)
- 123. Oriol Amat and John Blake.
  The Impact of Post Industrial Society on the Accounting Compromise-Experience in the UK and Spain (July 1995)