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By Charles A.E. Goodhart[1] and Mervyn K. Lewis[2]

[In 2016 Charles Goodhart was commissioned by the British Academy to write the Memoir for Mike Artis, an honour that all deceased Fellows are accorded; Goodhart immediately asked Mervyn Lewis to become a joint author. The Academy, however, understandably, applies a space constraint. So we are herewith separately publishing a longer version of our Memoir about Mike. This has three main advantages:-

1) This allows a fuller treatment of Mike's life's work;
2) It enables us to provide a more comprehensive record of his publications, than is available anywhere else;
3) It gives us room to record our acknowledgements to those, including many of his colleagues and friends, who helped us with this exercise.[3]]

Michael Artis was born in Croydon in 1938 to Violet and Cyril, the name Artis reflecting Huguenot origins. He was never one for sitting on formality, and was known universally as 'Mike'. The family later moved from London to Blackpool, where Mike was to acquire the

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[3] We are most grateful to the following for their help in putting together this Memoir of Mike Artis' academic career; any errors remain our own:- Shirley Artis, Hilary Artis, David Blackaby, Robin Bladen-Hovell, Marco Buti, Veerle Deckmyn, Michael Ehrmann, Keith Hancock, Richard Harrington, Julia Hiltrop, Barry Hughes, David Laidler, Yves Meny, Marcus Miller, Paul Mizen, Bob Nobay, Roberto Nocentini, Toshihiro Okubo, Denise Osborn, Marianne Sensier, Peter Sinclair, Sarah Stevens, Bob Wallace, Helen Wallace, Alistair Watson and Bernhard Winkler.

Northern accent that was later to puzzle his colleagues at the European University Institute, near Florence when he moved there towards the end of his academic career.

It was in Blackpool that Mike in the early 1960s met Lilian Gregson, then a research assistant at the Blackpool Infirmary, and they married in 1961. Their first daughter, Rosamond, was born when Mike was at Adelaide University and she was one of more than six children born to Faculty members around that time. It was a very happy and lively period in their life with many social functions involving large numbers of children. Their second daughter, Hilary, was born after their return to the UK. In their early years at Swansea many Australian friends visited Mike and Lil, and enjoyed their hospitality. However, the marriage ended and they divorced in the mid-1970s.

While at Swansea, Mike fell in love with the Economics Department secretary, Shirley Knight, and they married after Mike moved to Manchester. Shirley's children, Mark and Jacqui, accompanied them to Manchester and Mike welcomed them and was a great help to both of them. Mike had made many lifelong friends in Australia and they maintained their close relationships with Lilian, Ros and Hilary, while remaining in touch with Mike and his new family. Mike and Shirley later moved to Florence where they seemed especially happy. Four years after returning to Manchester Mike suffered a stroke and was incapacitated; Shirley was a strong support as were his daughters, Rosamond and Hilary.

Mike was what would be described as a 'bright spark'. He shone at school in Blackpool, winning a place at the top local grammar school (Baines Grammar School). From there, Mike gained a scholarship to Magdalen College, Oxford to read PPE from 1959 to 1961, being the first from his school to achieve such distinction. His tutor at Magdalen was David Worswick, whom Mike held in great affection and respect.

On graduation he was encouraged to join the Oxford Institute of Statistics, and his ability was recognized by Tommy Balogh (later Lord Balogh). It was under Balogh's supervision that he began work on his first book and published his first journal article in 1961.

First journal article

In this first journal article, 'Liquidity and the Attack on Quantity Theory', published in *The Bulletin of the Oxford University Institute of Statistics* in November 1961, he tackled one of the biggest issues of the day in monetary economics, namely the contribution of the August 1959 Report of the Committee of the Working of the Monetary System under the Chairmanship of Lord Radcliffe (the 'Radcliffe Report'). Although the committee members included two academic economists, Professors Alec Cairncross and Richard Sayers, in the manner of such reports there were Tables and Figures, but no equations or diagrams and the conceptual basis was largely hidden from sight. Mike's article, by far the most illuminating of the multitude of reviews and commentaries on the Report, provided an interpretation of the underlying framework in a way that, while distinctive, could delineate the issues for an academic audience; and it was appropriately reprinted in the Harry Johnson and Money Study Group edited volume *Readings in British Monetary Economics* (1972).

The Radcliffe Committee's major conclusion was that money did not matter in economic policy. If the government sought to control the quantity of money, substitutes for it would emerge so rapidly that any attempt at control would prove pointless. In short, control of the quantity of money in the economy would not lead to control of inflation These conclusions seemed to run directly counter to Milton Friedman's contemporaneous contentions summarized in the catchcries that 'money matters' and that 'inflation is always and everywhere a monetary phenomenon'.

In the UK, the Radcliffe Committee's assessment met with a mixed response. Those who reacted most strongly against the Report were those economists such as E. Victor Morgan who can best be described as 'quantity theorists' (rather than the later description 'monetarists'). They insisted that a fundamental difference exists between money and other financial assets and were highly critical of the emphasis in the Report on liquidity as the appropriate focus of policy. To them, the money supply seemed more readily quantifiable and less amorphous than what the Report called the 'state of liquidity', a term which seemingly embraced confidence, incentives, and attitudes incapable of precise measurement.

It is on this point that Mike Artis entered the scene in his first article. In evaluating this 'attack' on the Quantity Theory, he drew attention to three main features. First, when considering the quantity theory of money. it is necessary to distinguish between what he called the 'naïve' and 'sophisticated' quantity theory. Second, he then took the analysis further by drawing on American analysis of money substitutes. Third, he built on that analysis to provide a different interpretation of liquidity and money in terms of the quantity theory.

As he noted, 'the Committee was in no doubt that variations in money supply could be offset, in their effect on price levels, by variations in the velocity of circulation, adding moreover, that we … cannot find any reason for supposing … that there is any limit to the velocity of circulation (391)' (Artis, 1961, 345). To make sense of this (arguably extreme) position, it is necessary to consider the 'sophisticated quantity theory', as Mike called it, and his interpretation of the Radcliffe Committee's attack on it.

In his article, he argues that the Committee's emphasis on the 'whole liquidity position', to a considerable degree paralleled research in the United States on the impact of non-bank financial intermediaries in monetary policy by Gurley and Shaw (1956, 1960). A leading monetary economist, Don Patinkin (1961), helpfully translated these implications into the Keynesian framework. In terms of the standard Keynesian model, the growth of non-bank financial intermediaries is analytically equivalent to an improvement in the liquidity of bonds. Such increased liquidity renders bonds a better substitute for money causing the demand curve for money both to shift leftwards and to become more elastic with respect to interest rates.

To the best of our knowledge, due to publication lags, Mike Artis was not aware of Patinkin's article, yet he independently arrived at a similar treatment of non-bank financial intermediaries. Patinkin's analysis was couched in terms of the demand for money function. Mike's ran in terms of its inverse, the velocity function, linking velocity positively to the rate of interest, which is envisaged to shift rightwards, so that velocity is stretched at a given interest rate. Moreover, the original velocity function may shift progressively to the right, giving the appearance of a more elastic velocity relationship since the observed schedule is flatter than the individual velocity curves.

These may seem to be subtle differences. Where the two accounts really part company is in terms of the environmental factors underlying the shifts. Patinkin's treatment gave the impression of the shifts in the demand for money function due to the existence of non-bank financial institutions being a quasi-accidental, once-for-all occurrence The alternative scenario proposed by Mike Artis, as a rationale for the Radcliffe views on liquidity and velocity, is that the shifts in the demand for money due to non-bank intermediaries are not autonomous, accidental events but are in fact institutional developments induced by the monetary tightening, constituting a potentially greater challenge to the quantity theory of money.

We have dealt with this first article at some length for two reasons. First, it sets the stage for his revisiting of the demand for money a decade and a half later. Second, it illustrates a hallmark of Mike's career, a (then young) scholar combining in a measured way a variety of explanatory approaches and interpretations within an encompassing conceptual framework. In this case, it is perhaps ironic that, despite the Radcliffe Committee's emphasis on 'liquidity', the analytical framework employed was that of the quantity theory and the demand and supply of 'money'.

His first book

A second article was published less than two years later in February 1963, also in the *Oxford Bulletin* on the topic 'Monetary Policy and Financial Intermediaries: the Hire Purchase Financial Houses'. Following the Radcliffe Report there was interest in sources of 'liquidity' outside of the banking system, and this led directly to a discussion of the hire purchase houses in Mike's first book *Foundations of British Monetary Policy*, (1965).

Foundations was concerned, not with monetary policy as such, but with the development of those fundamental and institutional relationships underlying the authority and ability of the Bank of England to initiate and implement monetary policy. While these institutional factors take many forms and are continually changing under the impact of developments in the economy, the political situation, and in economic thinking about the aims and means of monetary policy, the analysis is centred on three 'basic' arrangements, these being the Bank's relationship with the apparatus of government, its own internal organization (as affecting its expert ability to formulate appropriate policies), and its relationship to the financial system. In the last case, Mike made an interesting observation that the Bank's control of the financial system, which rested heavily on informal persuasion, rather than upon statutory provisions, paralleled the Bank's own position, of quasi-independence, from the government, notwithstanding that the Bank was formally nationalized in 1946.

With the book covering the years 1939 to 1963, much of the discussion now falls into the realm of monetary history. However, he was sufficiently prescient to pick up that major changes were afoot at the end of the period in terms of the beginnings of the Euro-dollar market and role of the merchant banks in raising foreign loans, that is, the Eurobond market. These markets were to transform the City of London from the vestiges of the sterling area into a major, indeed the leading, international financial centre for foreign exchange, international bank loans and bond issues, and trading activities based around these and derivatives. The Bank's use of 'its weight to encourage a revival of the international status of the London capital market on an 'entrepôt' basis' (*Foundations*, p77), often in the face of US opposition, testifies both to the central role of the Bank, and Mike's early recognition of it.

Foundations of British Monetary Policy was, for all intent and purposes, Mike Artis' PhD. That was the era when Oxford distanced itself from the American PhD system, so that one instead wrote a book. However, when the Blackwell volume was published in 1965, Mike had left Oxford and, as the title page recorded, was Lecturer in Economics, University of Adelaide.

The move to Adelaide

This switch came about because earlier in 1960 Harold Lydall, Deputy Director of the Oxford Institute, was dissatisfied with the change of leadership at the Institute and sought a position in Australia, initially going to the University of Western Australia, and then to the George Gollin Chair in Economics at the University of Adelaide as the head of a department in his words 'full of young talent'. When looking for additional staff, Harold head-hunted Mike, who joined in 1964.

At Adelaide University Mike renewed his friendship with Robert (Bob) Wallace, whose time at Oxford overlapped with that of Mike's. That renewal saw a marked change in the direction of Mike's research as he and Bob began conducting an analysis of Australian fiscal policy, a topic which in comparison with Australian monetary policy seemingly had attracted little academic attention. This research continued when both Bob and Mike became two of the four foundation members of what was initially the University of Adelaide at Bedford Park and then became Flinders University of South Australia.

The first fruits of the research were presented by them at an ANZAAS Conference in Melbourne in January 1967, but the bulk of the work came out later, as two chapters (the only ones) on fiscal policy (one conceptual, the other empirical), in a compendium (edited by Neil Runcie) on *Australian Monetary and Fiscal Policy* (1971). 'Assessing the Fiscal Impact', the analytical contribution, deserves to be remembered as a seminal paper. In this they argue that the main macro-economic function of the Budget is to influence the course of overall demand and GDP (functional finance). By this criterion the summary indicators of the 'thrust' of the annual Budgets used by Australian Treasurers since 1945, indicators such as the Consolidated Revenue Fund, the overall cash balance, and the net increase in public sector indebtedness, were all judged to be woefully inadequate. Having disposed of the politicians, the authors then turned their attention on their fellow economists, again with devastating effect, before proposing, along Keynesian analytical lines, how the effect of Budgetary measures on the economy might, and in their view should, be measured. Based on these analytical tools, the authors then turned to an historical assessment of all of the Australian budgets between 1945 and 1966, which constituted the content of the second chapter of theirs in the Runcie volume. By way of an endorsement of their work, the discussant of their ANZAAS paper, John Nevile of the University of NSW, noted that their fiscal multipliers of the effects of government spending changes were very similar to his, obtained from a large scale econometric model.

Mike continued to use his expertise in fiscal policy in his later career. In 1972 he wrote a chapter on ‘Fiscal policy for stabilization’ as used by the Labour Government in 1964-70 (finding that it was distorted in practice by the failure to counteract balance of payments weakness and by the need to support the subsequent 1967 devaluation), and it became one of the themes he extended while in his first years at Manchester University.

The Prices and Incomes Board

The UK Government referred the question of the system and level of bank charges to the National Board for Prices and Incomes (NBFI) on June 22, 1966. Aubrey Jones, Chairman of the Prices and Incomes Board, invited Mike to join the Inquiry as Consultant, and immediately following the ANZAAS conference Mike took leave from Flinders University to return to the UK. There is no internal evidence, nor indeed any acknowledgement (to him or any other assistant), of this work as consultant for the NBPI. But his own subsequent accounts of his experiences suggests that he played an active and energetic role, and that his time in Australia had left its mark. Thus he recalled that "his close and direct questioning of one of the witnesses provoked the response 'Are you an Australian or something?'"

When the NBPI Report on Bank Charges (Report No. 34) was completed and laid before Parliament in May 1967, it was highly critical of the cartelized structure of rates in the banking system, the lack of competition and also the practice of maintaining hidden reserves. When much the same field of enquiry was opened up in the following year by the referral to the Monopolies Commission of the then proposed merger between Barclays and Martins Bank, it was natural for Mike, given his prior experience with the NBPI to write a review of the Monopolies Commission's Report for the *Bankers' Magazine* (1968), again critical of the same subjects. These Reports helped to set the climate of ideas that led up to the *Competition and Credit Control* reform in 1971. Mike's assessment at that time was that technology would change banking dramatically and that the structure of fees and charges needed to be sorted out or else customers would be severely disadvantaged proved to be accurate. He was obviously cognizant of the micro as well as the macro aspects of money and banking, but his views were ignored, even treated with some scorn, in Australia and the UK. When asked how he felt about that by Alistair Watson, a colleague from Adelaide then based in the UK, Mike replied that "some people like one's work and others don't. I would be really concerned if people I liked didn't like my work. Otherwise, I stick to my own standards."

As it was to turn out, Mike Artis did not return to Adelaide, other than a number of short-term trips to visit friends. Nevertheless, the Adelaide connection continued. After his appointment to a Chair at Swansea, his first visitor was Dr Barry Hughes of Flinders University, who during his six month stay attended Mike's inaugural lecture. His second overseas visitor was Mervyn Lewis (the second named author of this Memoir) with whom he was to work on and off over two decades on researching the demand for money and British monetary policy.

The National Institute

Despite enjoying his time in Australia, the lure of staying in the UK proved too strong and in October 1967 Mike joined the National Institute for Economic and Social Research. In 1967 Frank Blackaby, who had been the Editor of the National Institute Review ever since its initial issue in January 1959, was looking forward to taking leave of absence from the Institute to work at the International Institute for Peace and Conflict Research in Stockholm. At the start of the year there had been an Assistant Editor, but she withdrew from that position after the May issue, the Review being a quarterly publication, coming out then, and since, in February, May, August and November of each year. That meant that there was no obvious internal candidate to replace Blackaby as Editor.

David Worswick, the Director of NIESR, had taught Mike Artis at Magdalen College, Oxford, when Mike was an undergraduate there, doing PPE, and was aware of his great ability, and Mike arrived at the Institute in London in October 1967, just in time to participate in the publication of the November 1967 issue. After that, and two subsequent issues as Assistant Editor, he then took over as Editor for the August 1968 issue. Being much younger, and less experienced (of NI ways) than Blackaby, he was bolstered by a newly formed Editorial Board, which besides Worswick and Kit Jones, included two relatively senior Research officers, R.L. Major and G.F. Ray, the latter largely responsible for the Statistical Appendix. A little over a year later in November 1969, Mike edited the 50th issue of the Review, which was marked for the occasion by a newly designed cover, and a somewhat revised lay-out, as well as the Introduction by Lord Roberthall. The issue contained a Review Readership Survey, a first for the NI, which, although unsigned at the time, was subsequently attributed to Mike as author, and an important article by M.C. Kennedy on the accuracy of the NI's forecasts.

In those years, neither the detailed forecasts of the Treasury, nor (even more closed to the public) of the Bank of England, were published. A major role for the NIESR, and for its Review, was to provide publicly accessible forecasts for the remainder of the current year, and for the next year ahead, of likely economic developments in the UK ('The Home Economy') and in the World Economy. The February forecast was usually the most detailed since it was the first to cover the following year (quarterly). Besides the forecasts, the (subsequent three) issues of the Review each year included special articles, most of which expounded at greater length on the functional relationships, including econometrics, of various component parts of the forecast.

As well as these articles, there were other special papers that were the subject matter of academics who had been seconded to work at the NI, or were of special interest to the Research Staff. Brown's papers on Regional Development (May 1967 and November 1968) fit into the former category; the papers by R.L. Major and S. Hays (November 1970) and M.H. Miller (August 1971) on the 'Common Market' fit into both categories. Editors often becomes involved in the subject matter of articles that they edit, so this experience may have been the initial trigger for Mike Artis' later interest in both regional and European economic issues. The NI was a strong proponent of Prices and Incomes policies as the best way to control inflation, especially Blackaby, who wrote a special paper (November 1971) about this, and with Mike published an earlier article 'On Incomes Policy' in the *District Bank Review*, March 1968.

One special article in the Review was written by Mike Artis, assisted by Bob Nobay, on 'Two Aspects of the Monetary Debate' (August 1969) in which (following various studies in the United States spurred by the growth of monetarism) they used reduced form regressions employing different lag distributions to compare the relative efficacy of fiscal and monetary changes. It was found that fiscal measures, rather than monetary ones, appeared to be "more powerful and certainly the quicker acting', the latter perhaps indicative in the UK context of Milton Friedman's hypothesized 'long and variable lags in monetary policy'.

That result might well have been of some comfort to the NIESR staff. Their forecasts of the UK economy gave little or no emphasis to monetary data, and the NIESR stance in general was firmly Keynesian, anti-monetarist, and pro incomes policies. At the time, the NIESR was one of the four main econometric forecasting teams, the others being the London Business School, HMT and Southampton, and the NIESR models were constructed around the national accounts identity and expenditure functions.

Mike Artis was by preference and training a macro-monetary economist, rather than a professional econometrician or model-builder, and most of the technical work in developing and extending the model(s) then used by the NIESR was taken on by others, more specialised economists such as Ray Byron (another link to Adelaide), Fane and Surrey. Nevertheless, Mike was a highly competent and efficient applied economist and played a full role in the, inevitably largely judgmental, process of moving from a model print-out to a fully articulated forecast, taking account of prior residuals, and special factors. At the Southampton Conference (1969) on Short-Run Econometric Models, it was Mike who gave the paper on 'Short-Term Economic Forecasting at NIESR'.

By May 1972, however, Mike had been at the Institute for 5½ years, and had participated in 19 issues of the Review. Being Editor does not leave much time for original, personal research; during these years he had authored only three academic papers. It was time to move on.

University of Wales, Swansea: 1972-76

Harry Johnson had returned to England, to take a Chair at LSE in 1966, thus holding a joint position at LSE and the University of Chicago. At Chicago, Harry had been influenced by Milton Friedman and the emerging school of Monetarists. On arrival at LSE, he gathered around himself a group of younger monetary economists, several of whom, notably David Laidler and Michael Parkin, were willing to challenge the mainstream Keynesian approach to inflation (via incomes policies). In 1969 Harry founded the Money Study Group (MSG), ironically some ten years after the Radcliffe Report, that was so critical of the quantity theory of money.

Although Mike Artis was at the NIESR then, which was, institutionally, a strong supporter of Keynesian analysis and incomes policies, Mike was nonetheless essentially a monetary economist, and was prepared to assess all arguments on their merits. Consequently, he gravitated towards Harry Johnson's coterie of monetary economists. David Laidler writes (personal correspondence),

> "From its very beginning in 1969 he (Mike) was a regular participant in Money Study Group activities. He was at all the big conferences that produced volumes (Hove, Sheffield, LSE, Bournemouth) and he was also a major player ion the editing of *Readings in British Monetary* Economics that went out as edited by Harry Johnson and an MSG Committee. In my memory, the point about Mike was that, though a bit of a Keynesian cost-pusher among the monetarists, he was open minded and willing

> to listen as well as talk. Also, and very important, he knew a lot more about the institutions and details of data than any of the rest of us (his stint at NIESR presumably gave him this) and in this respect he was a particularly good influence!"

One of these monetary economists, and very close to Harry, was Bob Nobay, who had been a research economist at NIESR when Mike arrived in October 1967. They jointly wrote the 1969 Review paper, and edited together three conference volumes, despite Mike not being a contributor.

One of the concerns that Harry Johnson and his group had was that almost all of the available main writings on monetary analysis emanated from the United States. In order to provide a somewhat equivalent UK set, Harry encouraged the MSG to provide *Readings in British Monetary Economics*. The selection of papers to be included was made by Artis, Croome, Gibson, Laidler, M.H. Miller, Nobay and Parkin, the leading young UK monetary economists of the day, and included no less than five excerpts from Mike's own work.

Consequently, it was no surprise that, at the age of 34, Mike was appointed to a Chair at Swansea starting September 1972. In doing so, he completed a triumvirate of monetary economists appointed to Chairs at Swansea: E. Victor Morgan from 1945 to 1966, Edward (Ted) Nevin, 1968-1985, and Mike from 1972-1976. Interestingly, Victor Morgan left Swansea for a Chair at Manchester, and so did Mike in due course.

Those who have met Mike Artis know that he possessed a keen, if understated, sense of humour. His dry wit was in evidence in a comment in the opening remarks of his 1973 inaugural lecture in Swansea. Noting that he was the Professor of Applied Economics while Ted Nevin was simply Professor of Economics, Mike gently inquired whether that was because Ted's economics were supposed to have no application.

One of Mike's students from the University of Adelaide, Mervyn Lewis, who formed an Honours Money class of two in 1964, and was then Senior Lecturer in Economics at Adelaide, took a year's study leave in 1973/75, spending six months in Swansea and six months in Manchester, where Laidler and Parkin had moved. Upon arriving in Swansea, Mike Artis suggested that it was worth looking into what was happening to the demand for money in the UK. This turned out for Artis and Lewis to be happy turn of events, as the collaboration resulted in 4 articles, 2 books and 3 chapters in books. Although these publications stretched to the time when Artis and Lewis had Chairs in Manchester and Nottingham Universities respectively, it makes some sense to discuss them at this juncture.

After Milton Friedman in 1956 defined the quantity theory (of money) as in the first instance a theory of the demand for money, estimating demand for money functions became all the rage amongst monetary economists for at least the next two decades. At issue were three contentions of Friedman:

(1) The quantity theorist accepts the empirical hypothesis that the demand for money is highly stable …

(2) The quantity theorist … also regards it [the demand function for money] as playing a vital role in determining variables that he considers of great importance for the analysis of the economy as a whole …

(3) The quantity theorist also holds that there are important factors affecting the supply of money that do not affect the demand for money (Friedman, 1956, p16).

Artis and Lewis' first paper was published in *The Banker*, March 1974 and examined the stability of the demand for money. It was first given at a MSG meeting at the LSE in

November 1973, and was memorable to the authors because, after a meal in London, it was necessary to catch the train to Swansea. However, an IRA bomb scare meant that they were trapped at the bottom of Kings Cross, the deepest tube station, with all of the escalators switched to coming down. Somehow the two managed to run up the bank of down escalators (not to be recommended) in order to catch a taxi to Paddington.

In the March 1974 article, the authors considered recent concerns about the stability of the demand for money. By demand for money is meant a mathematical or statistical function relating the money which the public desires to hold to determinants such as income and interest rates. If such a relationship is relatively stable and predictable as compared with the behaviour of the real sector of the economy, then this is a strong point in favour of monetary policies which are aimed at the money supply, and it is a matter of record that from a point in the late 1960s the monetary authorities increasingly emphasized monetary aggregates, especially the money supply, in their policy statements. Further there was the evidence of the Bank of England's own research interest in the demand for money (undertaken by Charles Goodhart and Andrew Crockett, and published in the *Quarterly Bulletin*, June 1970).

In common with other research at the time, the Bank's equations appeared to rest on three basic ideas. First, the amount of money which people and business firms wish to hold varies directly with the flow of money income, and inversely with the interest rate. Second, it was assumed that transactors in aggregate can always obtain the money balances they require, so that the money supply is determined by demand. Finally, the concept of 'partial adjustment' was incorporated. This is the idea that people will not move to their desired long-run money holding immediately but will take time to do so.

It was widely believed in the City that these research findings (published under the title 'The importance of money') may have heralded a new approach by the Bank.

> 'Recent UK monetary policy has placed increased emphasis on control of monetary aggregates, a policy based, it seems, on an official assumption that there is a stable demand for money' *(*The Banker, March 1974, pi).

On this basis, and given that during the two years to mid-1973 the quarter-to-quarter rate of growth of the money supply on the M3 definition averaged 22.0 per cent per annum, and for M1 averaged 14.7 per cent, the task that Artis and Lewis set themselves was to check out how far that pattern of recent monetary growth could be accounted for by demand for money functions of the type that seemed reasonably successful in making sense of the 1960s.

To this end, the authors began by re-estimating twelve variants of the standard demand function over the period 1963 QII-1970 QIV, in order to make use of revised series of the money supply. By normal statistical criteria, the equations obtained were well determined, their overall fits were satisfactory, and they appeared sensible.

These equations were put to the task of 'forecasting' the level of money demanded in the period beyond the end of the 1970s, using concurrent and lagged values of the explanatory variables. It turned out that the forecasting ability of the equations, whether for M1 or M3 is quite good for 1971, but disastrously bad for 1972 and the first two quarters of 1973. Over the period to 1973 QII, the increase in the supply of money, according to these versions of the demand for it, exceeded demand by amounts which ranged for the lowest estimates from 37 per cent (in the case of M1) to 62 per cent (in the case of M3).

Three explanations were offered for these results. First, Friedman's 'empirical hypothesis' of monetary stability may not apply in the British case. Instability in the demand for money appeared to underlie the thinking of the Radcliffe Committee, for example. Second, some factors peculiar to 1971 and 1972 may have produced successive shifts of the demand function which were accommodated by the monetary authorities. Allowance was made in the demand equations for three such shift factors (CDs, bond price variability, the ‘own’ rate on money) but they made no difference to the result. This left a third possibility, namely the money stock supplied may have been in excess of that demanded, producing subsequent pressures on asset prices, incomes, and the balance of payments until the desired ratio of money to nominal income was eventually restored. It is this third possibility that formed the basis of the other two articles of the authors on the demand for money.

In order to explore the excess money idea, the authors had first to put to rest the widespread view that the stock of money in existence must be demanded. It is, for sure, held but, in the authors’ view, not necessarily demanded except as a temporary store of purchasing power in the process of moving from one equilibrium to another. If the sources of new supply are augmenting the money stock fast enough, it is plausible to suppose that individual transactors will find their money holdings are out of line with, and in excess of their expectations and desires, and the authors noted that the disequilibrium could be perpetuated if the cycle should be repeated by further injections. The dissipation of excess holdings of money through the rearrangement of portfolios, a generalised downward pressure on interest rates, and upward pressure on purchases, the level of prices and imports – a process which takes time – could therefore be overwhelmed by further unexpected increments in money holdings.

Why is it that such considerations were not, seemingly, present in the minds of those who investigated the demand for money in the 1960s? Artis and Lewis argued that the basis of these investigation – largely unstated – seems to have been that the supply of money was necessarily demand-determined, because of the Bank of England's policy of stabilizing the rate of interest (at varying levels). Given this policy, the Bank would then have to supply the money to validate it rendering the money supply demand-determined.

However true of the 1960s, Artis and Lewis contended that the conditions of 1972-73 offered an inhospitable context for applications of this view. The successive highly expansionary budgets, the floating of the pound, the abolition of advances' controls, and (perhaps) the Bank's change of tactics in the gilt-edged markets all offer reasons why one might conclude that the stock of money was not determined by the going demand but rather was in excess of it. Their conclusion, from this viewpoint, was that the standard demand function was incorrectly specified, and its failure unremarkable.

How should the demand for money be specified in such circumstances? In their 1976 *Manchester School* article, Artis and Lewis advance two alternative models. Both recognize that money demand may have been adjusting to money supply rather than the opposite assumption embodied in the standard demand for money equations. However, the models differed in how this adjustment is envisaged to take place. In the first model, money income is assumed to bear the adjustment. An increase, say, in the money stock raises the actual ratio of money to income relative to the desired level. Any discrepancy between actual and desired money holdings was hypothesized to set in train a rearrangement of the flow of expenditures and thus output and prices until the ratio of money to income is brought to the desired level. The model specified that this process would likely occur over time, with allowance made for possible factors that may produce temporary departures from the adjustment mechanism and act as a constraint upon money-holders' ability to bring the ratio of money to income to the desired level. In fact, on the estimates obtained, the adjustment process appeared 90 per cent complete after 20 months, and the parameters of the model seemed to be affected less by the inclusion of data for 1971 and 1972 than the standard model.

On the basis of the first model, Artis and Lewis concluded that the results lent support to the hypothesis that, as a reasonable working assumption, the money supply is capable of being treated as substantially independent of demand in the short run. They then explored the consequences of accepting the assumption that the supply of money is not demand determined, in combination with the idea that the rate of interest (rather than income) provides the market-clearing mechanism, at least in the short run. The framework of analysis is provided by the standard theory of liquidity preference, but it was recognized that with quarterly data the money market need not always be thought of as fully cleared, and they allow for partial adjustment of interest rates to monetary changes, which did appear to be the case. Although interest rates are the dependent variable, so effectively turning the equations 'the other way round', the model allowed the authors to dig out the parameters of the implied demand for money function, and the income and interest rate elasticities seemed sensible.

Overall, Artis and Lewis suggested that the appropriate way of viewing adjustments to changes in the money supply is as a partial adjustment of income and interest rates, and their results seemed to support this idea and challenged the conventional idea that the money market always clears in the short run. These alternative models also provided an interpretation of contemporaneous monetary policy which differed from that implicit in conventional work on the demand for money. In their view, the money supply is seen as having more than an accommodating role to play and the models they employed accordingly visualized the constituents of the demand for money, namely income and interest rates, adjusting to supply rather than the other way round. Significantly, it was claimed that the results were broadly consistent with the view that changes in the money supply had been interacting with a relatively stable demand function.

Their third paper, 'How unstable is the demand for money in the United Kingdom?' in *Economica* (1984) , sought to approach the issue of stability in an alternative way. Frank Paish and Christopher Dow presented evidence in their submissions to the Radcliffe Committee of what appeared to be an inverse graphical relationship between the consol rate and the ratio of money to income (the inverse of the velocity of money) using annual data from 1920 to 1957 and the old M2 definition of money (which in 1982 constituted 86 per cent of sterling M3). Both Paish and Dow drew a scatter line of the two variables. Artis and Lewis did likewise and then superimposed on it the regression line that they calculated for the same years. They next added the out-of-sample observations for 1958-1981. With the exception of the data for 1973-1976, the regression line fitted the extra-sample data extremely well. Both the observations for the 1960s and those for the late 1970s and early 1980s lie close to the curve fitted to the 1920-1957 sample. The data were suggestive of long-run stability of the demand for money, provided of course that the observations for the mid-1970s could be accounted for satisfactorily.

One explanation of the mid-1970s disturbance advanced by HM Treasury, associated it with institutional changes, the reforms brought in under Competition and Credit Control: the more competitive banking stimulated by these reforms made money more attractive, shifting the demand curve to the right. But if this is so, there is the difficulty of explaining how the curve came to move back again.

This left as the principal alternative the 'disequilibrium', or supply-shock explanation, put forward by Artis and Lewis in 1974 and 1976. On this view, the observations of the mid-1970s were attributed to supply shocks arising from the removal of advances controls, the move to a flexible exchange rate regime and the budget deficits of the time. These shocks seemingly forced the private sector off its demand curve until the disturbance was eventually eliminated via the induced adjustment of prices, incomes, interest rates and the money supply itself, restoring the ratio of money to income to its original path.

Artis and Lewis' three articles on the demand for money were obviously prompted by the instability of standard demand for money functions in the early 1970s that they documented and then sought to explain. Nevertheless, their work may have had a more enduring impact in a number of respects. First, they appear to have been the first to have challenged the view – described by them as fallacious – that the stock of money must be demanded, and that the supply of money was necessarily demand-determined Second, following on from this argument, they helped usher in a strand of monetary analysis based on 'buffer stock' money and 'disequilibrium money'. Third, short-run demand for money functions of the type that they examined in 1974 and 1976 assumed that people would take time to bring money holdings to the desired levels, and the functions allowed for balances to be in the process of adjusting to equilibrium. Almost invariably the speeds of adjustments estimated indicated that less than 50 per cent, and sometimes as little as 15 per cent, of the difference between actual and desired money balances was eliminated in one year, and that in consequence many years elapsed before the adjustment of balances was, say, 90 per cent completed. Lags of such length surprised many economists, and seemed almost counter-intuitive. However, when turning the equations 'around the other way', Artis and Lewis offered an alternative that flew in the face of conventional wisdom. Their argument was that existing studies ignored the possibility that a short lead of velocity (the inverse of the ratio of money to income) relative to interest rates is a viable, indeed sensible, alternative to a (very) long lag from interest rates to the velocity of money.

From the authors' own viewpoint there was a lasting impact because their work on the demand for money, and their implied criticism of the policies pursued by the monetary authorities, led to them writing two books on monetary policy. The first, *Monetary Control in the United Kingdom* (1981), was focused, in addition to reviewing research on the demand for money, on issues of the nature of bank intermediation and the implications for monetary control. The second volume, *Money in Britain: Monetary Policy, Innovation and Europe* (1991) was widely used in Masters' Courses in Money, and can be said to have influenced how a generation of monetary economists thought about monetary matters. In addition, it also devoted more attention to the European Monetary System (EMS), the Exchange Rate Mechanism (ERM) and European Monetary Union (EMU). The latter emphasis led, when the ERM broke down in August 1993, to those authors being invited to evaluate the experience and the implications in the *Oxford Review of Economic Policy*, Autumn 1993('Après le Déluge: Monetary and Exchange-Rate Policy in Britain and Europe') later reprinted in 1996. In the article, they argued that a 'quick' move to EMU would be a solution attractive to Europe (sans Britain) which proved to be accurate enough in the circumstances (although taking until the beginning of 1999 to get underway). Thereafter, for much of the rest of his career, such European issues were to occupy a lot of Mike's attention.

<u>The University of Manchester: 1975-1995</u>

In May 1975, while still at Swansea, Mike was summoned to Paris, [along with one of the authors of this memoir, Charles Goodhart], to meet Dr. Jim Cairns, then Treasurer in the

Australian Labor Government. Cairns had become unhappy with the liberal, market ideology of both the Treasury and the Reserve Bank of Australia, and was now looking for an outsider to become Governor who would help him to shift the allocation process from a pure market system to a planned system based on social priorities. Artis' (and Goodhart's name) had been suggested to him, it is understood, by Geoff Harcourt. Anyhow in the note for the record at the time for the Bank of England, June 2, 1975, Goodhart wrote,

> "Professor M. (Mike) Artis is much more in sympathy with Cairns, knows Australia, and was a minor adviser of Whitlam and an ALP member when there. He is a good, well-balanced monetary, macro-economist: he edited the National Institute Review before going to Swansea. Cairns, in a longer interview with him, made more effort to attract him, discussing terms of pay, etc. He would seem a sensible choice in the circumstances, whereas I would guess that Cairns has now put me among the unacceptable 'market' men. However Artis is doubtful whether he should go any further on personal grounds (family worries, doubts about the responsibility, etc.)."

In the event, however, both Cairns and the Labor Government soon ran into political troubles, and the chance for Mike to become Governor of the RBA, always a long shot, evaporated.

In 1974 David Laidler and Michael Parkin were becoming frustrated with their positions at Manchester University. They faced continuing up-hill battles to get their (more monetarist) papers published in top English Journals; their battle to have their paper on 'Inflation' in the *Economic Journal*, 1975, was epic. Pay scales at Manchester were restricted. The UK academic scene was limited in comparison with that in North America.

Enter Harry Johnson once again. He used his influence, and connections with Grant Reuber, to resettle David and Michael in the University of Western Ontario, London, Canada, in 1975. But that left a huge gap at Manchester. Harry knew just who could fill that gap. Within the pecking order of UK universities, Manchester lies quite well above Swansea. So Mike was happy to move, even though Manchester was then also known for fractious in-fighting between the Marxist and mainstream wings of its Economics faculty. Moreover, Mike must have seemed particularly well-suited for his new position, since he could comfortably interact with almost everyone, and hated conflict.

Once he had arrived in Manchester, he began to diversify his research fields further away from his earlier concentration on monetary economics. His first foray outside monetary economics in Australia had been into a study of fiscal policies there, already described. He continued this work on fiscal issues with papers on:

(i) 'Recent Developments in the Theory of Fiscal Policy: A Survey', from Cook and Jackson (eds), *Current Issues in Fiscal Policy,* (1979), which dealt with expectations, supply constraints and open economy effects.

(ii) An introductory chapter on 'Fiscal and Monetary Policy – An Introduction to the Issues', Chapter 1 in Artis and Miller (eds), *Essays in Fiscal and Monetary Policy*, (1981), concentrating on model-based simulations of fiscal policy.

Marcus Miller was recruited to Manchester at much the same time as Artis, in order to help fill the gap created by the departure of Laidler and Parkin. He collaborated with Mike on several papers in the next few years, but left for Warwick in the early 1980s, to a less divisive faculty.

(iii) 'Recent developments in the theory of demand management', Chapter 1 in *Demand Management, Supply Constraint and Inflation* (1982), which analysed the effects of monetary and fiscal policies in the context of both fixed and floating exchange rates.

(iv) 'Using the Treasury model to measure the impact of fiscal policy, 1974-79', with D. Leslie and G.W. Smith, Chapter 2 in the preceding volume. This is a more substantive simulation exercise, using HMT's econometric model, to simulate the impact of the Labour Government's fiscal policies (expenditures and taxation).

(v) ‘The effects of economic policy, 1979-83’, jointly with Bladen-Hovell, Karakitos and Dwolatzky, in the *National Institute Economic Review* (1984). This was an even more ambitious simulation, using both the NIESR and Treasury models of the effects of fiscal policies, monetary policies and competitiveness on the assumption of either fixed or floating exchange rates. Considering the scale of shortfall of GDP assessed, see for example Table 5, p. 65, the Conclusions seem surprisingly tentative.

The second additional field into which Mike entered in these early years at Manchester was the form and existence of a wage equation, initially focussing primarily on empirical developments in the UK. Here there were two papers, with considerable overlap. The first, with Marcus Miller, on ‘Inflation, real wages and the terms of trade’, in Bowes (ed.), *Inflation, Development and Integration* (1979), and the second, ‘Is there a wage equation’, in Tony Courakis (ed.), *Inflation, Depression and Economic Policy in the West* (1981). The starting point was that the original formulation of the Phillips curve, relating wage inflation to unemployment, had broken down in the context of worsening inflation through the 1960s and 1970s. This had been replaced by two alternative hypotheses, the augmented expectations version of the Phillips curve, and the target real wage model. But Mike found that neither of them was ‘robust’ in the face of empirical testing. Moreover wage growth could be strongly affected in any short period by the imposition and/or removal of direct controls on wages, via prices and incomes policies. So he was rather sceptical as to whether any reliable wage equation could be found.

This was, of course, a period when monetary targetry, even if only of the pragmatic variety, was in vogue. Most of the prior analytic work on monetary targetry had been done for the

USA, which approximated to a closed economy. So there was a question how such targetry would operate in an open economy context, such as the UK, especially when the exchange rate might be subject to (Dornbusch style) overshooting. This was the subject which Artis and Currie analysed in two overlapping (1981) papers, the first being ‘Monetary and exchange rate targets: A case for conditionalizing’, in *Oxford Economic Papers*, and the second, ‘Monetary and exchange rate targets’, in *Monetarism: Trditions, Debates and Policy*, ed. by Courakis and Harrington. Their overall conclusion was (OEP: p. 196):-

> “…for a small open economy in which cost-mark-up pricing dominates, stabilisation of the nominal exchange rate (by means of suitable changes in domestic monetary policy) offers rather better prospects for price stabilisation than do monetary targets. Only if disturbances to the economy arise primarily from changes in the general level of foreign prices are monetary targets likely to be clearly superior, and we would not regard this as the relevant case for the UK.”

Having then covered monetary and fiscal policies in his research, together with their interaction with other countries in an open economy framework, plus a study of the supply side of the economy, via wage equations, Mike felt ready to put all these strands together in a macro-textbook, entitled *Macroeconomics* (1984) (31). The blurb on the back of the paperback edition gives an accurate representation of the contents:-

> “This volume is designed as a textbook on macroeconomics suitable for second year undergraduates, or for first year undergraduates who already have some acquaintance with the subject. It emphasises the policy aspects of macroeconomics in an open economy, and refers to UK institutions and national accounts. It renders accessible the results of recent developments in macroeconomics, both in the analysis of asset accumulation effects, and in the clarification of Keynesian macroeconomics provided by the analysis of general equilibrium under rationing.
>
> The larger part of the volume treats the Keynesian fix-price model with particular attention being paid to open economy aspects, and to the analysis of fiscal policy. Later sections introduce the classical variable-price fix-output model, extended to include rational expectations and ‘monetarism’.
>
> The volume seeks to convey a useful macroeconomics – one that is suited to policy applications. Diagrams play a large role in the exposition although the use of formal mathematics is kept to the minimum needed for a rigorous exposition.”

In fact, the role of diagrams was understated, for they probably played a larger role than in any equivalent book. A lot of the volume was relatively standard. The book is based on the IS/LM framework, with the addition of a BB curve for the Balance of Payments, and focusses on the estimation of multipliers. The money supply is derived from the credit counterparts, and for the first 9 out of 12 Chapters, prices and wages are treated as fixed. Perhaps the most original contribution is the emphasis on asset accumulation and wealth as a determinant of long-run equilibria (Chapter 9). The discussion on the relative merits of Monetarism and Keynesian analysis, Chapters 10-11, is very fair, as would be expected from Mike, but indicates a clear preference for Keynesian-style analysis. While the volume may not have added greatly to his academic reputation, it put his name before many future macro-economists and, being reprinted at least twice in 1986 and 1989, the royalties may have helped. It was only later after Mike moved to Italy that money was rather more plentiful.

Meanwhile, his reputation as a great editor of books, especially those put together from a collection of related articles, remained extremely high. Prest and Coppock had for many years, ever since 1966, assembled a set of articles which could serve as a Manual for assessing the UK economy. The book's title was, *The UK Economy: A Manual of Applied Economics*. So when the original authors wanted to give up the exercise of continuously up-dating the book to account for the passage of time, the baton was passed to Mike, and the first edition of many came out in 1984. The 14th Edition, (1996) for example, has some 11 Chapters by 9 authors on a variety of empirical aspects of the British economy, only one of which was written by Mike, jointly with H.W. Armstrong. This Chapter was on 'The UK and the European Union', pp 52-84. This reflects the fact that from the mid 1980s onwards, Artis' academic interests turned sharply away from macro-economic analysis is general, and monetary and fiscal policies in particular, towards a study of European monetary conditions, institutions and policies, and the UK's relationships with these.

There were several strands in Artis' growing focus on the working of the European Monetary System (EMS), and the UK's possible relationship with that. The line of work with the greatest number of publications took the guise of a general assessment of how the EMS was functioning. This set of papers started with Artis' publication in the *Journal of Policy Modeling* (1987) of a paper on 'The European Monetary System: An Evaluation'. This considered, inter alia, whether the short term volatility of exchange rates and interest rates had changed after EMS; and whether the exchange rates had become more predictable (less divergence from random walk); whether there was less sign of misalignment in real exchange rates; whether there was more policy convergence, and more convergence in wage rate adjustment; and whether capital controls still played a major role in stabilising the fixed, but adjustable, pegged system.

Mike applied some relatively simple statistical techniques to address these questions, and there was clearly some subsequent dissatisfaction as a result with the authority with which his conclusions could be drawn. The upshot of that saw Mike Artis teaming up with Mark Taylor to produce no less than ten subsequent joint papers in the years 1988-90, largely embroidering on Mike's initial work, but using more rigorous non-parametric econometric techniques. These included:-

(1) The 1988 paper confirmed that short run exchange rate volatility had declined, without any rise in interest rate volatility, and that capital controls had played a significant role.

(2) A chapter in the book by MacDonald and Taylor tested whether longer-term EMS misalignments had fallen, by examining unit roots in real exchange rates, and whether currency substitution had risen, by looking at evidence for risk premia in uncovered interest parities. The uncomfortable answer in both cases was ‘no’.

(3) The CEPR Discussion Paper, Bank of England Discussion Paper, and article in *The Economic and Social Review* are all basically reconfigurations of (1) and (2) above.

Artis and Taylor gave more attention to the role of exchange controls. Having started on that subject with the EMS, they turned their sights on the effects of the UK’s abolition of exchange controls in 1979, with three overlapping papers, in 1988, 1989 and 1990. While their work on this topic incorporates sensible judgements on the basis of available Balance of Payments data, nevertheless “Difficulties in controlling for concurrent shocks that might have affected the economy prevent a clear identification of the effects of exchange control liberalisation on asset prices and balance of payments flows”, (CEPR DP 294).

They also wrote two subsequent papers together on the effects of exchange rate misalignment on the subsequent path back to equilibrium, involving an empirical and also an analytical paper, both in 1995. Basically, misalignment, involving current account imbalances, leads to shifts in external debt, which, in turn, leads to a changed pattern of net interest payment flows; in equilibrium this needs to be balanced by an offsetting shift in the trading account, which requires an exchange rate adjustment. They examine the possible dynamic paths for such adjustments.

The second strand of Artis’ work on adjustment processes in Europe concerned asymmetrical wage/price interactions in Germany, as compared with other EMS countries and also with the

UK. This analysis began even earlier, than his general assessment of the EMS (above), with two empirical discussion papers in 1983 and 1984, both with Paul Ormerod, exploring and contrasting wage equations for Germany and other large European countries. These led to the uncomfortable conclusion that the wage equations appeared very different, with German wages responding much more to unemployment and much less to inflation, i.e. an old-style Phillips curve, than in France, Italy or the UK.

In order to assess how much this might matter, Mike turned to a two-country model that he had developed with Dr. S. Gazioglu in 1986, later published in the Courakis and Taylor edited volume (1996), initially to examine variations in the extent of financial integration. The model has sixteen equations for each country (block), and despite having only one asset in each country, (a composite currency/bond) had so many moving parts that "The simulations reviewed do not yield a simple set of calculations". No doubt as a consequence this strand of research then petered out.

The third strand of Artis' work at this stage of his career on such external relationships involved a couple of more general analytical papers on the advantages of international coordination to stabilize exchange rates. The first, and more substantial was in 1986, with Sylvia Ostry, in a Royal Institute of International Affairs volume, and the second, in 1989, in a book edited by Donald Fair and Christian de Boissieu. By the mid 1980s the shortcomings of a floating exchange rate system, e.g. over-shooting driven by capital flows, instability, were becoming apparent. Of course, one could not stabilize exchange rates by intervention alone (even if unsterilized), so there needed to be supporting policies. Artis and Ostry proposed nominal income targets; Mike always saw exchange rate pegs, in EMS and/or EMU, as a means for gaining greater commitment to contra-inflationary policies. Thus he envisaged the EMS/EMU as a way of inducing the laxer members to follow German counter-inflationary leadership, a hypothesis that he sought to test in this 1990 paper, with D. Nachane in *Weltwirtschaftliches Archiv*. They did so by examining whether the inclusion of German inflation improved the estimated forecast of domestic inflation, both in and outside the EMS period, and by examining co-integration tests for inflation in the same countries. With the benefit of hindsight one might say that Mike, perhaps, underestimated the problems of maintaining exchange rate stability in the context of potentially massive capital flows, (though he was fully aware that capital market integration had been increasing in the 1980s, allowing for larger current account imbalances, as evidenced by his IMF paper with Bayoumi (1989)) and overestimated both the ease of adjustment and the political will and capacity to introduce such adjustment processes, especially among surplus countries.

Although Mike was increasingly turning to international, and especially European, monetary economics in the 1980s and early 1990s, he continued to work, and publish, in a couple of other macro-economic fields, notably on his first main subject, domestic monetary economics. Already mentioned were the two books on UK monetary policy with Lewis. With him there was also a 1990 paper on the demand and supply of money and one in 1985 on inflation in the UK providing evidence of a long lag from the money supply to inflation, as well as arguing that monetary targets should perhaps be seen as a signal that the authorities were imposing an 'overriding constraint' on inflation. The 'disequilibrium money' idea was put to work in 1985 with Keith Cuthbertson using a buffer stock model to examine the demand for M1. There was also published in 1987 an examination of this 'monetarist experiment' with his erstwhile colleague and previous student from Manchester, Robin Bladen-Hovell, with whom he was to work extensively.

Although Mike had not been a forecasting technician, he remained a close observer and student of the forecasting process. Towards the middle of the 1980s and in the early 1990s, this led to two areas of work and publication. The first was to assess the accuracy of macro forecasts. This began with an invitation, very likely coming from Andrew Crockett who was then running the IMF *World Economic Outlook*, and had been a contemporary monetary economist (Crockett would have met Mike many times at Money Study Group events), to assess the accuracy of the WEO. This Mike did in his 1988 WEO paper. Besides comparing the IMF's WEO forecasts with actual outcomes, another yard-stick was to compare them with the use of simpler auto-regressive and vector auto-regression models. Following that exercise, Mike Artis teamed up for the first time with Wenda Zhang, a Chinese economist from Fudan University who had come to Manchester University (and was to become Mike's most important co-author in these decades), to study how the WEO forecasts compared with yet another forecasting technique, that of Bayesian vector autoregressive (BVAR) models, resulting in a joint article in the *International Journal of Forecasting* (1990) and a 1990 CEPR discussion paper (DP380), as well as a 1996 reprise of his earlier IMF study on WEO forecasting accuracy. This latter also included assessment of how well cyclical turning points could be predicted, a subject that he had begun to study for the UK with two related CEPR papers, in 1993 relating to growth cycles, and in 1994 on inflation cycles. Artis and Sean Holly, at more or less the same time, wrote 'Modelling the World Economy' in *Journal of Forecasting*; while with Moss and Ormerod, Mike also wrote a rather futuristic paper for the same Journal (1994) on 'A Smart Automated Macroeconometric Forecasting System', whereby intercepts are adjusted by rules, rather than judgment, to maintain certain, supposedly stable, ratios.

This was the time when the treatment of expectations in modelling the economy took centre-stage. Adaptive (backwards-looking) expectations were giving way to rational (forward-looking or model consistent) expectations. Prior to the 1980s virtually all policy simulations had been done in an adaptive, backwards-looking framework. Now Artis, with Bladen-Hovell and Ma, sought to estimate the (with model-consistent expectations) effect of policy measures by looking at three sequences for policy, variables, first a neutral reference path, second an anticipated path and third the actual path; (2-1) gives the effect of anticipated policy and (3-2) the effect of unanticipated policy changes. The authors applied this approach, in two papers, a CEPR DP526 and in *Oxford Economic Papers*, to the Labour Government's policies on policy expenditures, tax rates and interest rates, 1974-79. Actually they found that the 1976 crisis was so wrenching that methodological niceties made little difference. Policy was expansionary prior to 1976, with a sharp deflationary turn then, but with such a sharp subsequent recovery that much of the swing in 1976/77 must be attributed to an initial crisis of confidence, then reversed.

By now, mid-1980s, Artis' standing as a leading macro-economist in the UK was being widely recognised. He became a member of the Panel of Academic Consultants at both the Treasury and the Bank of England, and gave a paper to the latter on 'Why do Forecasts Differ' in 1982. He became Joint Managing Editor of the journal *Manchester School* for eighteen years, Associate Editor of the *Economic Journal* for ten years, and President of the Manchester Statistical Society from 1987-1989. More importantly, he was elected a Fellow of the British Academy in 1988, as one of the leading applied macroeconomists in the UK. He was then awarded a Houblon-Norman Fellowship at the Bank in 1989-90, followed by a Nuffield Foundation Social Science Fellowship at the University of Manchester.

As the 1990s progressed, his focus turned increasingly, now almost exclusively, towards European macro and monetary issues. This was a decade of great progress on that front, with much optimism on prospects for future Eurozone monetary unification. The collapse of the ERM in 1992-93 had not led to a reversion to generalised floating and/or exchange controls, but (as the *OXREP* 1993 article predicted) to a determination of the central political elite to press forward to a single currency. The Hanover Council (1988) had led to the Delors Committee (1989), which led to the Maastricht Treaty (1991), which culminated in the establishment of a single currency euro-zone on January 1st, 1999, and the introduction of euro notes and coins on January 1, 2002.

It was an exercise in political economy, and Mike eagerly participated. Perhaps his most widely read publication was the book that he edited on *The Economics of the European Union: Policy and Analysis*, initially with N. Lee, and in the editions from 2001 onwards with F. Nixson. In this he wrote the chapter on 'European Monetary Union', first solo and later with Bladen-Hovell. Cohorts of economics students will have read this. But he wrote many more such political economy studies on the transition to EMU at this juncture. Amongst these were articles in the *Journal of Common Market Studies* (1992) and the *Economic Journal* (1996), the latter published after Artis had moved to the EUI, but mainly drafted while he was still at Manchester.

On balance, he was a keen supporter of greater monetary unification, especially for the main continental countries, though more hesitantly for the UK, since the latter was more asymmetric in its characteristics. In addition to the obvious advantages of lower transactions costs and less (exchange rate) uncertainty, Mike prized both the counter-inflationary and fiscal discipline that such a system would bring. And he was keen on the general idea of greater European unity. The downsides were the loss of an adjustment mechanism, and the Alan Walters critique, (that a single zone-wide interest rate would have the perverse effect of stimulating (depressing) more (less) inflationary regions in the zone). In an, unhappily prophetic CEPR D649 (1992) on 'Counter-inflationary policy in the framework of the EMS', Mike argued that the Walters critique could be offset by more stabilising fiscal policy and/or exchange controls, without fully appreciating that politics would usually prevent surplus countries from fiscal expansion or deficit countries from austerity during booms, although a more kindly interpretation is that he was forewarning the European authorities as to what policy levers were needed to be put in place.

Another strand of Mike's work, which he was to expand greatly after he arrived at the EUI, was to study the symmetry and correspondence between cycles and their turning points amongst European countries, moving on from his prior study of cyclical turning points in the UK, in *Journal of Forecasting* (1994) with Moss and Ormerod and *OECD Economic Studies* (1995) with Bladen-Hovell and Zhang.

<u>EUI at San Domenico near Fiesole</u>

With his attention now fixed on European monetary issues, there was a clear case to move from Manchester University, in a somewhat euro-sceptic country, where European issues always ranked behind domestic ones, to a newly established centre, the Robert Schuman Centre at the EUI (European University Institute), which specialised in the subject which Mike now took for his own. Moreover, the site of the EUI (San Domenico near Fiesole outside Florence) is breathtakingly beautiful, and both the academic community and the wider Italian population naturally welcoming.

As a result, Mike applied in 1994 for the advertised joint position of a Chair in the Economics Faculty at the EUI, and to become the (first) economist to join the newly established Robert Schuman Centre for Advanced Studies, a Research Centre there. As noted above, the EUI was a good place to go to develop his research agenda. As well as its location, it had already established a prestigious reputation, and being a graduate Institute it had a very favourable salary/teaching requirement trade-off.

He went through the normal interview process, chaired by the first Director of the Schuman Centre, Yves Mény, who was to become a close friend, and he was also greatly supportive to Helen Wallace when she succeeded Yves as Director of the Schuman Centre. Yves recalls that Mike was clearly the best candidate, but the proposal to appoint him was not easy as it was the very first case of a joint appointment between a department and the newly established Schuman Centre. At the time, Mike only spoke English and French, and moreover, the former with a northern accent that apparently some there found hard to understand. He subsequently learned Italian; acquiring a good knowledge but still a bit reticent about speaking. These communication difficulties were, however, fully offset by his kindness and constant availability to students and colleagues.

Mike was appointed to this joint position as from January 1, 1995; the term of the Chair was for four years, renewable once for another four years. The main teaching function was the training and supervising of PhD students, of whom Mike had 23 during his years there, from cohorts ranging from 1993 to 2002, and from nine countries. Four of these, Fiorella de Fiore, Martin Ellison, Marcel Fratzscher and Mathias Hoffmann, along with Ramon Marimon of the EUI, organised a Conference in his honour in June 2016 at EUI. Several of his students collaborated with him in research and publication.

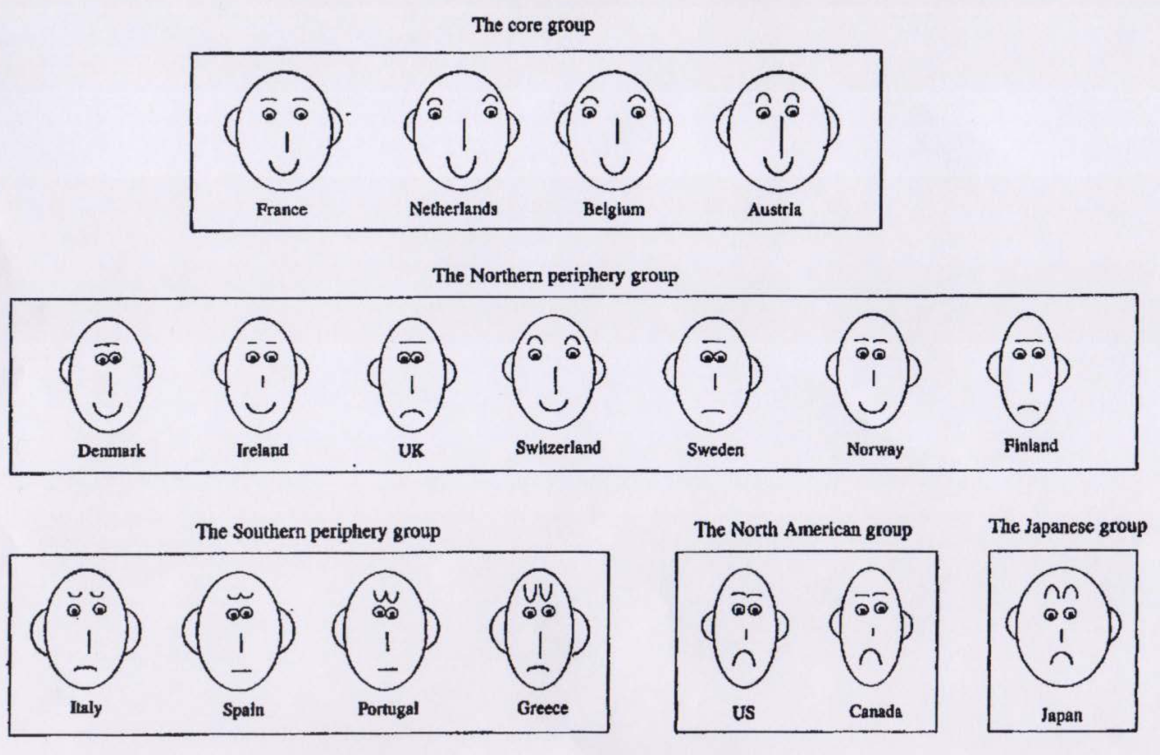
The second main function was to undertake and encourage research, especially on European issues. Mike took part enthusiastically both in his own research, described at greater length below, and in supporting the research context for others. He played a large role in the (brown-bag) seminar programme and in the establishment of the Pierre Werner Chair of Monetary Integration, first held by Giancarlo Corsetti. He got on extremely well with the other economists (and other academics), many of whom joined him there, such as R. Perotti, R. van der Ploeg and G. Bertolla.

His research during these years at EUI mainly followed two separate, but related, strands, both related to European Monetary Union. The first, more technical, set of papers assessed the statistical inter-relationships between the EU economies (and with the USA and Japan), concerned primarily with the relationship between the UK and the core countries of EMU, e.g. Germany, France, Benelux. The second set consists of a series of macro-economic commentaries on the concurrent political economy developments in EMU, e.g. Gordon Brown's five tests for UK membership of the single currency; the Stability and Growth Pact; EU unemployment; an inflation target for the ECB, etc…

The first set includes a sizeable series of joint papers with Wenda Zhang, who moved to the EUI to be with Mike, later in 1995, before subsequently returning to Manchester in 1996 to the Metropolitan University there. But he retained a contract with the EUI to work with Mike for a further two years. Mike was the senior economist, but Wenda, a mathematical economist, will have done the greater part of the technical exercises. These include three on common European Business Cycles, four on Clustering in EMU, two on European Interest Rate Linkages, and one on European Exchange Rate Linkages.

Of these statistical studies, those seeking to assess the extent of ‘clustering’ between countries are, on this view, the most original and insightful. Thus a set of variables for relationships between countries is, somewhat arbitrarily, selected, (e.g. synchronisation in business cycles, in real exchange rates, in real interest rates and in exports/import cycles), and then countries are ranked in their closeness of relationships, initially bilaterally and then in wider groupings. While this did not lead to any major surprises, (thus there was a central core European Group, a separate Northern Group – UK, plus Ireland and Scandinavia, and a Club Med Group), it allowed such common understandings to be nicely quantified and graphically displayed in a useful way. In particular, he and Zheng were able to depict in *Economic Issues* (2001) the clusters of countries pictorially as faces, or emoji, [as reproduced below], where each aspect of the face represented the closeness of each linkage, with Germany, the anchor country.

Figure 3. Faces representation of the OCAs criteria



Whether Mike Artis was looking at correspondence between cycles, both in levels (i.e. classical cycles) and in growth rates, for output and inflation, between interest rates or exchange rates, there was a recurring common thread. Before the ERM was formed in 1979, there was a single world business cycle, largely led by the USA. After 1979, however, there was a core of continental countries in Europe whose economies moved in concert with Germany, the anchor country, but separately from the USA. Notably, the UK was not in this group, instead, along with the main Scandinavian countries, it continued to fluctuate in conjunction with the United States.

These findings were a challenge for him, since he would clearly have preferred the UK to adopt a much closer European involvement. He had to face the issue squarely in some of the papers in the second set of publications, (the political-macro-economic commentaries), notably the three papers in the Cobham and Zis volume (1999), the Artis, Weber and Hennessy volume (Routledge, 2000) and the EUI Working Paper 2000/67. ‘The UK and EMU’ chapter included an assessment of the Chancellor’s five tests for EMU entry in 1997. His conclusions, from the Routledge volume was that:-

> “The evidence reviewed in this paper suggests no “strong” economic case for participation in the EMU. If anything, the organizing framework of the OCA approach suggests that the UK might be right to stay outside; in particular its stochastic experience is different from that of the “core group” within the Euro-zone and on these grounds the UK will need a stabilizing policy instrument. Membership of EMU would remove the possibility of using monetary policy and a floating (or adjustable) exchange rate in that role. Reliance on labour-market flexibility alone is unlikely to be enough and, in the event of joining, there will be a premium on fiscal policy flexibility. The limitations of OCA analysis are several, however; and, besides the room that this gives to “other factors”, including political ones, in making the participation decision, there is always the issue of the extent to which past patterns of behaviour will continue to hold in the future.”

In general, the commentaries on the relative success of EMU utilized Optimum Currency Area (OCA) theory, following Mundell (1961) and Krugman (1990). Mike's general concern was whether, in the light of OCA theory, the economic benefits would outweigh the economic costs of joining (in terms of the loss of the use of monetary and exchange rate policies as adjustment mechanisms), either currently or prospectively, (against the possibility that joining EMU might lead a country to become more homogeneous with the rest of the Eurozone). Relatively little attention was paid to more political economy issues in the formal analysis, though he was clearly himself highly sympathetic to the wider arguments for greater European federalism.

His assessment on the adoption of Inflation Targetry by the ECB, with Kontolemis and Mizen in three papers in 1998 are quite mainstream, but in his paper on the EU's unemployment problem in *OXREP* (1998), he reverts to an earlier proposal, then with Sinclair from 1996 in *Metroeconomica*, for using wage subsidies to encourage employment. This was outside his normal fields of expertise, and he did not pursue the issue further. Another commentary involved a discussion, with Fratianni in *Open Economic Review*, of the forces causing Italy and the UK to exit the ERM in September 1992.

In view of Mike's prior track-record of advocating greater fiscal activism as a means for overcoming both the Walters critique and the loss of monetary adjustment mechanisms in a currency union, one might have expected Mike to be rather critical of the Stability (and Growth) Pact (SGP). But no doubt partly persuaded by his co-author, Winkler, he gave it his qualified support in the *National Institute Economic Review* (1998) and the CUP book in 1999, and returned to the same theme in his article with Buti, in the *Journal of Common Market Studies* (2000). The argument was that, in view of future unfavourable demographic trends, a medium or longer term objective for a balanced fiscal budget was sensible. Given the achievement of that in normal times, the 3% deficit constraint should leave enough room for automatic stabilizers (and some counter-cyclical measures) to work during down-turns. So the Pact was essentially only a "transitional" problem. Moreover, it had other advantages, such as making life easier for the ECB, being a rules-based measure that would please the Germans, and possibly being a step away from nationalism towards a more federal Europe.

Subsequently he examined, with Onorante in CEPR DP (2006), the relative success of fiscal policy in smoothing the cycle in the main Eurozone countries, and concluded (p. 28) that it "has not been effectively used as a counter cyclical macro-economic tool"; hence the cost of constraining such policies via the SGP (either in its initial or revised (2005)) form was limited. Another reason for adopting a relatively cautious medium-term objective for fiscal deficits was that forecasts for these were subject to considerable error. He studied such fiscal forecasting, with Marcellino, in *Econometrics Journal* (2001). Nevertheless, there remained some tension between his earlier views that greater fiscal flexibility would be needed to make a single currency work well and his later support for the fiscal rules embedded in the SGP.

Christopher Dow had previously been sceptical whether fiscal policy could be applied to smooth the business cycle, so it was appropriate that Mike was picked to be one of authors to review Dow's 1998 book on *Major Recessions,* where he wrote the section on Dow's choice of case studies, in the *National Institute Economic review* (2000).

Despite Zhang's return to Manchester, to the Metropolitan University, the main technical side of Mike's research continued to be on the dating of business cycles, in the UK, the Eurozone and other developed countries, and the linkages (transmission mechanisms) between cycles in different countries, especially in relation to the key anchor countries of Germany and the USA. Examples include research papers with Kontolemis and Osborn; with Kohler and Melitz; with Krolzig and Toro; with Toro; with Osborn and Birchenhall; with Krolzig and Toro; with Osborn and Perez-Vazquez; with Marcellino and Proietti; with Galvao and Marcellino; and with Fidrmuc and Scharler. Indeed, his focus on this same subject continued after he returned to Manchester, as will be described later.

As time passed, the econometric and analytical techniques that he used became increasingly high-tech. A research exercise that had begun using simple cross-correlations, e.g. between countries, moved on to Markov switching auto-regressions, and observed transition vector auto-regression models. Moreover, his article with Marcellino and Proietti in the *Oxford Bulletin of Economics and Statistics* (2004) was a methodological contribution about how business cycles, and their co-movements, should be analysed. Nonetheless, the basic message, that there were three distinct groupings of countries in Europe, i.e. core, Northern and Southern, remained. Subsequently Mike also used the same techniques to explore whether the transitional states of Eastern Europe were well-suited (on OCA grounds) to join EMU, with a generally positive conclusion. The one change in overall assessment that Mike made over time, e.g. in the *Journal of Applied Econometrics* (2007) was that the bipolarity that he had perceived in the late 1980s and 1990s between a core European group anchored around Germany, as contrasted with a wider group anchored around the USA, tended to diminish in the early 2000s, as most developed countries became (once again) largely influenced by the United States.

Other more technical and econometric papers at this time included a CEPR Discussion Paper (2000), with Ehrmann, a study of whether exchange rate fluctuations mitigated, or enhanced, shocks for the UK and three other countries, using a SVAR methodology; and a couple of papers , a EUI Working Paper (2001), published later as a *Journal of Forecasting* article (2005) with Banerjee and Marcellino on the application of factor forecasts to the UK.

As well as his research flourishing at the EUI, Mike loved the relaxed, cheerful Italian lifestyle, as well as the food and wine (although he was not a big drinker), yet retained his love of English tea. His stay at the EUI was one of the happiest periods of his life. Even after his renewal came to an end at the end of 2003, he returned every summer to EUI as a visiting (Emeritus) Professor from June 2004 until June 2009), unpaid but with full facilities.

One of the more unusual episodes of his research career occurred there in 1997/98. One of his junior colleagues, Marco Buti, (now (2017) the Director-General for economic affairs at the European Commission), and the mayors of two local townships, Fiesole and Pontassieve, had the idea of running a simulation experiment, to issue euro-coins and a euro 'voucher-banknote' in advance of the actual true euro issue in 1999, to see, for example, how the euro and the lira might jointly circulate. Marco decided to enlist Mike to act as a senior proponent, to provide greater academic gravitas. Mike then participated wholeheartedly.

> "The Euro symbols were: a one-Euro coin, a half- Euro coin and a 3 Euro "voucher-banknote". Following the approval of the Banca d'Italia, they were produced by the Zecca dello Stato and Poligrafico dello Stato (State Mint) and the exchange rate was fixed at 2000 Lire for 1 Euro. From October 1, 1997 until March 31, 1998 these "Euro symbols" circulated alongside the Lira in the municipalities of Fiesole and Pontassieve, which at the time counted 15000 and 20000 inhabitants respectively. Once the experiment was over, the two populations had a 3-month time for withdrawal….
>
> Every shop involved in the project received a kit including stickers displays which had to help identify the business' adherence to the experiment. Other marketing devices were also conceived and included in the kit, which was also sent to the banks: posters, brochures, displays, price lists and price labels.

> The project "Ecco l'Euro!" consisted in fact in a wide range of initiatives including all the economic and social actors of the time on the territory of Fiesole and Pontassieve, in order to address a multiple-objective goal.”

Return to Manchester

After his formal position at EUI ended, he stayed on in 2004 as an external Professorial Fellow. In 2005 he was awarded a position as a George Fellow at the Bank of England, January to July, though he and Shirley continued to live primarily at Fiesole. However, in 2005, he was approached to become Professor of Economics and Director of the Institute for Political and Economic Governance (IPEG) at the Manchester Regional Economic Centre at Manchester University, although, as earlier noted, he retained close ties to EUI and Fiesole, as a visiting Professor and a regular summer visitor. Consequently it is not really possible to mark any break between research done at EUI and in his second stint at Manchester. While the main thrust of his work continued to be on links between economic cycles in different regions and countries, he did open a new research subject with Mathias Hoffmann, in three CEPR Discussion papers, one in 2004 and two in 2007. The issue that concerned them was that, in a more globally connected world, the financial assets held by residents in country X would not be so concentrated on claims on their own country’s production, i.e. less home bias. Accordingly, such residents’ total income and consumption ought to be better insured against idiosyncratic shocks to their own country’s output. Indeed, globalisation had greatly reduced home bias in investment from the 1990s onwards. The problem was that most econometric tests, relating the change in consumption in country X to the change in output in that same country, did not exhibit any significant decline in that coefficient over time.

Artis and Hoffman proposed two possible reasons for the above negative finding. First, they argued that shocks to output were more muted in the 1990s. if such permanent shocks took place more gently, but were recognised by consumers in advance of their full effect, consumption changes might respond more sharply than output changes. Second, they suggested that the studies in first differences gave excess weight to short-run influences, whereas consumption insurance via the capital account could be a long-run phenomenon. So they constructed a cross-country panel test in levels of output and consumption from which they could, on the basis of certain key assumptions, estimate the extent of home bias and income from abroad (NFI) Their results indicate a sharp fall in home bias and rise in NFI in the OECD in the 1990s.

In the final years of his academic career, Mike found another regular co-author, Toshihiro Okubo from Kobe University. Together they published some seven papers over the period 2008 to 2012, all still related to spatial interactions amongst business cycles; there were, however, two new twists to this study. First, they examined much longer historical time periods, and second, they began to explore regional cyclical relationships within countries, (intra-national linkages), for the UK and Japan. In both these new sub-fields, Mike worked with others, as well as with Okubo. Thus he researched with Chouliarakis and Harischandra on cycle synchronisation over long historical periods, in the *Manchester* School (2011), and with Dreger and Kholodilin, also in the *Manchester School* (2011) on regional business cycles. Moreover, having been appointed as the Welsh Assembly Visiting Professor at Swansea in 2008, he worked on the timing of cycles in unemployment for each unitary authority in Wales, (which was taken on by Marianne Sensier after Mike collapsed), published in *Regional Studies* (2016), which in fact turned out to be his final published article.

There was one other paper, with Miquelez and Moreno, in the *Journal of Economic Geography* (2012) relating area-wide productivity per employee, to density, and various other variables, e.g. R&D, employee quality, that hinted at a further possible line of development, (even though Miquelez was the key author).

The crowning achievement of his work in these later years was the (international) symposium that he initiated and largely organised on 'Business Cycle Behaviour in Historical Perspective'. The symposium was held at the University of Manchester in June 2009. Most of the papers presented there were collected together, and published in a special issue of the *Manchester School*, in 2011 edited by Artis, Chouliarakis and Barry Eichengreen Not only did this issue include two of his joint papers, but he was a Guest Editor, and the Introduction came out over his name.

Regrettably, by this time he was no longer capable of continuing his academic career. On the way driving home to his house in Knutsford on October 30th, 2009, he suffered a stroke. Initially it was hoped that he might recover almost fully, but he then was struck down by hospital infections, e.g. MRSA, and became incapacitated, needing 24 hour care. His body was letting him down, yet his colleagues, especially Richard Harrington and overseas friends who visited him can attest that his brain remained active, but unfortunately his condition deteriorated over time

Assessment

Although Mike Artis was a rounded macro-economist, it was as a monetary economist, working largely with Mervyn Lewis, that his earlier work will be best remembered. Thereafter, he undertook more general work on fiscal and wage equations, culminating in his

1984 textbook on *Macroeconomics*. But from the mid-1980s onwards his attention shifted towards the assessment of European monetary union, which he analysed mainly in terms of optimum currency area theory. His chief analytical contribution to this latter stage lay in the, applied empirical, study of the, regional and country, interlinkages between business cycles. In this area he became a, indeed possibly the, leading international expert.

Those who worked with him will remember Mike as a mentor and teacher, who invariably brought out the best from those with whom he interacted. He was always supportive and treated others' views, even those with which he disagreed, with respect. This is perhaps summarized by a former colleague who said simply 'he was a first-class human being'.

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