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The Implications for Firms and Industry of the Adoption of the ECU as the Single Currency in the EC

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The Implications for Firms and Industry of the Adoption of the ECU as the Single Currency in the EC

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EXECUTIVE SUMMARY

Most businessmen surveyed during this project indicated that there would be benefits to their organisations from the use of a single currency throughout the European Community. Nevertheless very few companies appear to have given detailed consideration to the implications of the adoption of the Ecu and the changes which would be necessary.

There are two principal explanations for this. Firstly, the widely held belief that a substantial degree of uncertainty still surrounds the eventual move to a single currency. Secondly, that the time horizon involved in monetary union is relatively long with the change to the Ecu coming near the end of the process.

Most companies will not act until a firm date for the introduction of the Ecu as legal tender has been set (E-day). The legislation which does this needs to specify the maximum timescale in which both the Ecu and national currencies will remain legal tender (the changeover period), before the latter is completely abolished, and indicate how existing contracts in national currency should be converted.

On the whole the introduction of the Ecu will not be a steady cumulative process. While its use will increase during the transition, most companies will delay switching until E-day. Their efforts in the transition will be geared up to ensuring than eventual conversion from existing currencies to the Ecu goes smoothly.

To carry out all the necessary planning and to ensure that a smooth changeover occurs large companies will require a period of around three years. While much of the planning for changeover (once the date has been set) can occur within an environment of fluctuating exchange rates, the exact conversion factors will need to be known some six months in advance so that computer programs set up to carry out the switch can be thoroughly tested.

The date for E-day therefore needs to be specified three years in advance and be at least six months into Stage III. Subsequently, there will need to be a changeover period which lasts for at least three months to allow machine manufacturers and users to move to using the Ecu. This indicates that the date for Stage III needs to be determined at least two and a half years in advance.

If action is delayed, because a firm date has not been set, significant additional costs will be incurred in the order of 25% of the total cost of the changeover.

The actions required by firms are substantial. Within industrial and commercial companies they include changes to the pricing structure, the billing and purchasing systems, and accounting and book-keeping. Within banks all customer account holding information will have to be converted and processing systems modified. In addition, all companies will have to convert their payroll systems. The extent of the problem is greatest where firms operate with a decentralised structure and have customised computer systems. Given these considerations the table below sets out the timescale and cost quoted for conversion by different types of organisations.

Organisation	Timescale	Cost
Machine producer/user	3 months	Small
Large multinational	2 years	Ecu 2.25m
Large national trader	3 years	Ecu 1.1m
Small trader	3 months	Ecu 100,000
Large non-trader	3 years	Ecu 3m
Large commercial bank	3 years	Ecu 10m

The problem should not be overestimated, however. Currency changes can be accomplished quickly as with German Monetary Union, and efficiently with little disruption as in the cases of decimalisation in the UK, Australia and New Zealand.

The information and training aspects necessary for an efficient changeover should not be forgotten. These include not only the requirements within firms, but also links with suppliers/customers and the general public. Parallel pricing will be necessary and conversion charts required, neither of which will be possible until the exact rates are known.

There are particular problems with the introduction of the Ecu which stem from the following:

1. The sheer scale of the exercise involved, and the requirement of a completely new set of notes and coins. This is a physical problem of currency change and not insurmountable, but will necessitate the early specification of all denominations, the sizes of banknotes and the weights and composition of the new coinage. Only then can minting and printing begin.

2. The nature of the link between old and new currency. Conversion will inevitably be complicated, as will any attempts to match coins. Establishing a new set of values will be crucial and require a widespread publicity campaign. Prolonging the period between the beginning of Stage III and E-day will probably delay rather than help this process, however.

While the onus is on the private sector to act the Commission and national administrations can do a great deal to help. Firstly, since most companies indicated that they would carry out conversion rather than make widespread use of the Ecu in the transition, promotion of such use may be misplaced and could detract from the ultimate objective of a smooth changeover. In the transition, a more fruitful approach may therefore be to inform and advise on what will be necessary for conversion.

Given the scale of the changes and the time required we recommend that a committee be set up charged with overseeing all aspects of the Ecu's introduction. This should be set up now, and its initial tasks should be to set the date for E-day and determine the denomination etc. of the new currency.

INTRODUCTION

The Delors report set out three stages for the process of Economic and Monetary Union (EMU). The first which was launched under existing European Community powers started on 1st July 1990. During this stage each member state should adopt policies aimed at achieving greater convergence, particularly with regard to price stability and 'sound' public finances, and all EC currencies should begin to participate in the Exchange Rate Mechanism (ERM). As of April 1992 the Drachma is the only EC currency which remains outside the ERM. The second and third stages require changes to the Treaty of Rome because they involve setting up new institutions. Agreement on these amendments was reached at the Maastricht Summit which took place on 8th and 9th December 1991, with ratification intended to be completed by the end of 1992. A timetable for EMU therefore now exists. The date for the start of the second stage has been set for 1st January 1994. At the beginning of Stage II the European Monetary Institute (EMI) will be formed paving the way for the establishment of the European Central Bank (ECB). This institute will be charged with facilitating increased use of the Ecu and overseeing the development of the Ecu clearing system. Stage III could start any time after 1st January 1997 and not later than 1st January 1999. At the beginning of this stage participating member states will adopt irrevocably fixed exchange rates, and the ECB will be established. The Ecu will not necessarily become the single currency at this point, however, since the EC treaty states only that there should be a 'rapid introduction of the Ecu as the single currency'.

At present the basket Ecu is principally used in financial markets. Ecu bond issues have grown rapidly over the last ten years and there now exists a well developed swaps market. Ecu banking activity has mainly been inter-bank, however. Business with non-banks is small and has grown very slowly. Use of the Ecu in trade invoicing is also very small. Although some companies have attempted to use the Ecu for cross border payments they have experienced a marked reluctance to do so from suppliers and customers. There are a few pan-European companies which use the Ecu in particular areas, principally for raising capital, setting transfer prices, and netting intra-company cross border transactions, but most use an existing national currency for such operations.

Given the current situation there appear to be three questions which need addressing. Firstly, what are the requirements for the smooth introduction of the Ecu as the single currency. Secondly, will there naturally be increased use of the Ecu during the transitional period (outside of the financial arena) as a consequence of its eventual role as this currency. Thirdly, should the authorities be actively encouraging more widespread use as well as ensuring that the changeover goes smoothly.

To begin to answer these questions it is necessary to identify all aspects of activity which will eventually operate in Ecu. The timescale required to move to the Ecu needs to be determined in each case, and an assessment made of whether it is practicable to operate with the Ecu as well as existing national currencies. If there are differences in the time required for particular functions these also need to be identified. Whether the Ecu can be adopted in the transition will hinge upon the extent to which dual/multi currency operation is possible and upon the timing issue. Whether it is adopted will only then depend upon there being distinct advantages from using the Ecu during the transition which outweigh any extra costs (over and above conversion) involved in operating with an additional currency.

Although nothing on this scale has been contemplated before some light can be shed on these issues through a study of other currency changes. Initially we therefore look at the experiences of the UK in adopting a decimal based currency system and the experiences of Germany during monetary union. Useful insights are provided into the nature of the changes necessary, particularly the structural and regulatory, and the length of time required to make them. Subsequently, there is a detailed analysis of the changes which will be necessary for companies to be able to use the Ecu as their single currency of operation throughout the EC. At this point the implications for industrial and commercial companies and for banks are addressed separately, with a first attempt being made to quantify the costs and benefits involved for each. The case for early adoption is also discussed with reference to these two sectors.

OTHER CURRENCY CHANGES

It is possible to identify four different types of currency change. The first involves changing the structure of the currency, both in terms of units of account and the relationship between various denominations. Examples of this include decimalisation in the UK, Australia and New Zealand. The second a switch from one currency to another existing currency, possibly with the abolition of the former. An example of this is German monetary union. The third an unpegging of two currencies which previously used identical units of account and which were exchangeable at a parity of one for one, as with the UK and Irish pounds. The fourth a change in currency, in particular revaluation, designed either to give it more credibility, or to simplify accounting procedures. Examples here include the introduction of the new French franc and the frequent revaluations of South American currencies.

In what follows we have concentrated upon the first two of these, since changes of this nature appear to most closely relate to those which will be necessary if the EC adopts the Ecu as its single currency, and a detailed study has been carried out of one particular episode which falls into each of these categories. In the first case this is decimalisation in the UK and in the second German monetary union.

I UK Decimalisation

This section draws upon the five reports of the UK Decimal Currency Board and upon a book written by its secretary shortly after the Board had been wound up.

Prior to adopting a decimal based currency the UK operated with a system in which the smallest unit was an 'old' penny(d) (although halfpennies were also available), twelve 'old' pennies made one shilling(s), and twenty shillings one pound(£). The system was therefore known as pounds, shillings and pence (£sd). Once the process of change was complete this system had been replaced with a decimal one in which the major unit of account remained the pound(£) but with the smallest unit now the 'new pence'(p), and one hundred 'new pennys' equalling one pound.

In what follows a very smooth changeover from £sd to a decimal system is described, and while this event occurred some twenty years ago some useful insights are still provided into the questions which need to be addressed in any currency change. Moreover, while the larger unit of account, the pound, remained the same, and hence it could be suggested that this was a very simple conversion, the change from a non-decimal system clearly presented some additional problems.

The Impetus for change

There had been talk of adopting a decimal system in the UK for over a hundred years. The pressure for such a change only really began to gather pace in the 1950s, however, when many of the UK's major trading partners in the Commonwealth began to adopt such systems. For example, Aden in 1951, India in 1957, and South Africa in 1961. The potential advantages for the UK were twofold. Firstly, it would make trade with the Commonwealth easier, and secondly the adoption of such a system would simplify both industry's and government's accounting procedures. One of the most influential reports was that by the British Association for the Advancement of Science and the British Chambers of Commerce, which when published in 1960 came out strongly in favour of the adoption of decimal coinage.

Chronology of events/announcements

It is clear from replies to questions raised in the House of Commons that the government of the day had already decided upon a decimal based currency system as early as 1962, but at this point the details of exactly what sort of system should be adopted had not been addressed and no timetable existed. In particular, it had not been decided whether to maintain the pound as the main unit of account, or to move to a system based around the 10s note.

The first formal piece of legislation concerning these details was the Decimal Currency Act of July 1967. This provided the £1=100p basis for the new decimal currency system, set out the denominations, standard weights, diameters and composition of the new decimal coins, and also fixed 1971 as the year for the changeover. In addition, it provided for the setting up of the Decimal Currency Board 'to facilitate the transition from the existing currency and coinage to the new currency and coinage provided for by the Act'. The duties of the Board included the provision of information and advice, and the determination of the exact day in 1971 for the changeover to occur. On the 15th February 1968 the Board's recommendation of the same date in 1971 was accepted by the government. This gave exactly three years to what became known as D-day.

The first Act was followed by a second in 1969 which gave the detailed arrangements for the changeover.

Preparation for the changeover

The Decimal Currency Board consisted of a Chairman and nine other part time members. The Treasury appointed the Board staff who were all civil servants. Even in the run up to D-day this staff reached a maximum of only 52. The Board set up three committees: the coinage and cash handling committee, an engineering committee to help machine manufacturers, and a committee to handle publicity. One of the immediate decisions of the Board was to allow for a changeover period following D- day to help machine manufacturers and users, in which both the new and old currency would remain legal tender. The exact length of this period was not specified, but the Board forecast that it would not exceed eighteen months. This changeover period did not apply to the Banks, however, which could not operate simultaneously in two currencies, and hence they were required to change immediately. Indeed, part of the reason for choosing a date in the middle of a month was because business in the bank pipeline would be at its lowest.

Three other provisions in the 1967 Act require mention. The first was the power it gave the government to put decimal coins into circulation before D day. The second allowed coins to be made by persons other than the Royal Mint, as long as they were made with the authority of the Mint, and the third was the decision, in contrast to Australia and New Zealand, to provide no compensation for the costs of the changeover.

In the event, the second option was not used because a new mint was built at Llantrisant, near Cardiff, to provide the 4,000 million new coins needed by D-day. The site to be used for the new Mint only began to be cleared in August 1967, but by August 1970 it had managed to produce all of the stockpile of bronze coins required - 3,400 million, approximately 60 coins per head of population.

Clearly being able to phase in the new coins was an important aspect of the gradual changeover to decimal coinage. From April 1968 the 5p was introduced instead of the old shilling, and the 10p instead of the 2s coin (the florin), although until D-day both retained their £sd monetary value. In addition, the 2s6d coin, the half crown, and the halfpenny, which did not have an easy decimal equivalent, were de-monetised. A new 50p coin was also introduced from October 1969 to replace the 10s note. Initially 120 million coins were supplied to facilitate the smooth transfer from notes to coins. This new coin came in for much criticism in the press upon its introduction, but it was the view of the Decimal Currency Board that 'on the rare occasions that new coins have been introduced they have always for a time been unpopular'. As demonetising got under way, some special provisions were also provided for charities, etc which found themselves in possession of such coins after they were no longer legal tender.

There were no plans to issue the new 1/2p, 1p and 2p bronze coins until D-day, but production was 'well under way' in 1968. In addition, there were plans to issue souvenir decimal coin sets through banks, and supply in bulk schools and cash handling organisations with the new coinage before D-day for training purposes. This latter facility became available in early 1970, with orders being taken through the banks but the coins being sent by the Mint directly.

The other major plans which had to be made in the run up to D-day largely involved ensuring that the necessary changes within industrial and commercial organisations would be well advanced by D-day and completed by the end of the changeover period. In this regard the Decimal Currency Board furnished information and advice and kept a close eye on the pace of change.

The DCB estimated that there were around five million machines which would be affected by the change to decimal coinage, of these approximately 80% consisted of cash registers, adding machines, keyboard accounting machines and price computing scales. Much of the DCB's work involved encouraging business to order early the new machinery required, and in this regard the Board suggests that most retailers had contacted their machine suppliers by the end of 1969, with a view to changing to decimal on D-day, and most machine companies had ample information to plan the necessary changes for business by July 1970. Coin operated machines, although they represented a large proportion of all machines that would have to be changed were considered relatively unimportant by the Board in terms of the cost of replacement or modification. In the event, the phasing out of the half crown appears to have posed more of a problem in this area, with changes to 5p, 10p and 50p in their £sd guise occurring as a result, so that only minor changes were required in the run up to D-day.

As of July 1970 firm orders had been placed for 80% of those cash registers which it was estimated would need replacement, and 50% of these orders had been completed. For adding machine over 50% of the necessary orders had been placed, with 35% of these completed. In terms of accounting machines 70% of the necessary orders had been placed, with 70% of these completed, and in the case of price computing scales 60% of the necessary orders had been placed. One of the important conversions here was of petrol pumps, which began in March 1970 with the expectation that all would be converted by D-day.

The DCB also highlighted all the following types of machines as requiring either change or replacement: taximeters, bus ticket issuing machines, postal Franking machines, telephones, parking meters, vending machines, and coin operated ticket machines. The time and cost involved were not considered to be very large, however, and by the summer of 1970 the DCB indicated that most of these machines which could be changed in advance, had been.

The other major organisational measures which were required involved changes to payroll and internal accounting and invoicing systems. Both payroll systems and accounting systems could be changed to decimal from the beginning of the 1970/1 tax year, although payment still had to be in £sd.

In the run up to D-day to facilitate an easy changeover the DCB produced a series of conversion tables which were required to form the basis of the switch to decimal. These are shown in Appendix I, and were designed to minimise the impact on overall prices. In addition, the DCB made it clear to business that they would need to order their new coins well in advance to ensure adequate supplies on the day.

D-day

All banks closed for four days before D-day. During this period they cleared all £sd items received before the 11th February (cheques and credits totalling between 5 and 6 million items) and converted their machines and accounts (using the whole penny conversion table) to decimal. When they re-opened on the 15th February 1971 the 14,500 branches involved worked exclusively in decimal, although they were still able to receive and provide £sd for those who needed them. Bills of exchange and promissory notes had to be in £p on and after D-day. Post-dated bills and promissory notes were treated as if drawn before D-day as long as they bore a bankers certificate to that effect. £sd instruments of payment which were issued before D-day but not cleared, were cleared as decimal items again according to the new penny conversion table, with approximate rates having to be used where the amounts did not convert exactly. Provision was made for instruments which fell due for payment during the closed period to be paid immediately before or after.

Contracts drawn up prior to D-day were either converted at the exact rate of 1d equals 5/12p or as agreed by the parties involved, but they did not become void.

All government departments changed over on D-day, as did most other organisations despite the existence of the changeover period, and by the end of March decimal had replaced £sd almost everywhere. 99% of shops were charging decimal prices and 95% were using decimal for their book-keeping.

In addition, most essential machines were converted quickly around D-day. In the case of cash registers, 65% were ready by D-day with the rest being changed within six weeks. With price computing machines, many changed during the latter months of 1970 and the conversion programme was largely complete by the end of May. In the case of accounting machines, most changed before D-day, and all by the end of August. In addition, two years work before D-day ensured that almost all postal franking machines could already work in decimal, and the rest were converted or exchanged soon after D-day. With petrol pumps, 95% had been completely converted by D-day. In contrast the conversion of the 1/4 million existing telephone boxes did not begin until a couple of days after D-day to allow people to obtain the new 2p coin. However, 99% had been converted within a month.

The machine industry produced many machines which could be switched to decimal on the day and this clearly eased the conversion problem.

During the changeover period both systems could be used to carry out transactions. This potentially presented a problem because only 2.5p (6d) multiples of the two coinage were exactly interchangeable. However, there is nothing in UK law requiring the giving of change and so as long as a slightly higher amount was offered in the other coinage transactions could still occur.

Due to the smoothness of the whole operation the changeover period came to an end on the 31st August 1971. Although clearly after that date £sd coins could still be used as tokens in machines. The cost of the Decimal Currency Board over the whole period totalled £2.6 million and it is estimated that the changeover to decimal, in terms of converting and replacing machines and the manufacture of coins, cost in total some £150 million.

II German Monetary Union

This section draws heavily upon a recent Bundesbank Report which discusses the technical aspects of monetary union with the GDR and hence concentrates upon the administrative changes involved in moving from the Mark(M) to the Deutschemark(DM), but this still provides some useful insights into how quickly change can occur if the political will is there. It may be a little strong to suggest, as did the IMF in their December 1990 paper on German Unification, that the changes all occurred 'without disruption', but given the scale of the changes involved it does seem fair to say that things went relatively smoothly.

The Impetus for change

The events which were to lead eventually to German Economic, Monetary and Social Union (GEMSU) began in the Summer of 1989, with large numbers of GDR citizens attempting to emigrate to the FRG through Hungary, Czechoslovakia and Poland. The authorities inability to stem this tide of emigration resulted in the resignation of the GDR Council of Ministers, the de facto East German government, on the 7th November. Two days later the GDR/FRG border was opened up to all GDR citizens, with the new government sworn in on the 18th November doing nothing to change this position. 167,000 emigrants left the GDR between January and October, and another 177,000 emigrated following the opening of the border. (This compared to 40,000 for the whole of 1988.)

On November 28th Chancellor Kohl proposed a ten point plan for unification. One of these points concerned the establishment of a DM2.9 billion fund allowing GDR citizens, with effect from January 1st 1990, to acquire Deutschemarks for Marks for travel purposes once a year, at exchange rates of one for one for the first DM100 and at one for five for the second DM100. The ten point plan contained no details on monetary union, however.

On December 3rd democratic elections were scheduled in the GDR for the middle of 1990. On January 12th 1990 the GDR constitution was changed to allow the establishment of a market based economy, and at the end of January the date of the elections was brought forward to March 18th.

Chronology of events/announcements

The first step in the build up to monetary union was the offer extended by Chancellor Kohl, on the 6th February 1990, of talks with the GDR government on currency union. This was followed on March 6th with the announcement of proposals to change the one tier East German socialist banking system to a two tier system similar to that in the FRG. These changes were to come into effect on April 1st. The State Bank gave up its commercial banking activities but remained the central bank, with its commercial branch and associated sector specific subsidiaries being constituted as joint stock companies.

There was much debate over the conversion rates which should be adopted, since a rate of one for one could well prove inflationary given the potential monetary overhang in the GDR, while anything away from par could well exacerbate the emigration problem. In the build up to the East German elections a number of pledges were made concerning conversion at par, and while this formula was no doubt considerably more generous than the Bundesbank would have privately wished, their initial proposals for conversion published on the 2nd April went a long way down this road. These proposals were subsequently amended on the 23rd of April, however, to produce on balance an even more favourable conversion rate.

The final conversion rates decided upon involved wages, salaries, rents, and other recurrent payments being converted into Deutschemarks at a rate of one for one. In addition, residents of the GDR would be entitled to convert Marks into Deutschemarks at parity in amounts of up to 2,000 Marks for those under 14 years of age, up to 4,000 Marks for those between the ages of 14 and 60, and up to 6,000 Marks for those older than 60, with other domestic financial assets and liabilities being converted at a rate of two Marks to one Deutschemark.

The dramatic chain of events leading up to GEMSU and the acceleration in the process following the March election resulted in less than a year to plan for all the necessary changes, and effectively a period of between three and four months to plan for monetary union.

Preparation for the changeover

The circulation of notes and coins in the GDR was largely confined to households' financial transactions. Enterprises and State Institutions were required by law to effect payments through transfers. In this way the currency in circulation was kept relatively low.

The processing of cashless payments in the GDR, like account keeping, was carried out under a system regulated and operated by the State Bank, with a uniform data processing structure and account number system. Cashless payments of all kinds, both credit transfers and orders for the collection of direct debits and cheques, could be processed by simple transfers since all customer accounts and clearing accounts of the banks were carried in this self contained system. Thus, there was no need for the processing and transmission of payment vouchers between banks. Every working day this system dealt with four million payments, and performed very efficiently within the centrally planned structure. However, it was totally unsuitable for a market oriented banking system because of the complete lack of individual security procedures, and while it had to be used in the interim the longer term plan was for complete replacement.

Technically the system of account keeping and cashless payments within the GDR (ESER) could not be linked up with the corresponding system in the FRG (EDM), but in the interim, despite these problem, procedures had to be adopted which allowed transfers of payments between ESER and EDM.

The target that the Bundesbank authorities had set itself was to be able to meet all demand for notes and coins on and immediately following conversion. However, it became clear very soon in the exercise that there would be insufficient pfennig coins. Hence it was decided that the 1,5,10,20 and 50 GDR pfennigs would remain legal tender for some time after conversion. Between April 2nd and July 1st 1990 the Bundesbank opened up a Provisional Administrative Office in East Berlin and fifteen other branches throughout the GDR. By the 1st July these offices had to be ready to supply 460 tonnes of currency worth DM 28 billion, and be in a position to offer all the usual Bundesbank services in the GDR as well. In particular, this meant providing refinancing services, giro account- keeping, the provision of currency and money processing, as well as the introduction of cashless payment procedures. In many cases this was to involve the introduction of new equipment.

The GDR Land Central Bank Areas each took over the technical, organisational and staff support functions of one or more of the Bundesbank branches. The organisation and logistic measures required to set the appropriate infrastructure in place included the installation of EDP equipment for processing cashless payments, money processing machines and basic office machinery together with the provision of office supplies, forms, etc. In many cases the old State Bank premises which were taken over did not meet the necessary operational requirements. For example, in many cases the poor condition and old age of the electrical installations led to frequent fluctuations in voltage and hence a new power supply had to be installed. Essential construction and installation work was carried out immediately, but inevitably much of the rest had to be delayed.

From the beginning of May onwards a small 'core team' was assigned with discharging the functions of the Provisional Administrative Office (initially this was in West Berlin). The Office was transferred to East Berlin on the 18th of June and the Staff subsequently increased. This gave less than two weeks to sort out all the details, but the Office was still ready for operations before the beginning of July. The new branches (as of 1st July) employed 250 staff from the FRG together with 900 staff from the GDR.

By June 1st new telecommunications facilities had been put in place and a data communications network set up linking the new Bundesbank branches with those in the FRG.

Between mid-July and August 10th all the branches in the GDR were connected to the German Federal Post Office's Datex-P network, so that full scale automated processing has been available since that date.

The terms of the first state treaty with the GDR provided only two days to supply all the residents of the GDR with a new stock of money. Savings and giro accounts, however, were not converted until a few days later - hence there was a seven day moratorium for cashless payments.

DM-day

The East German currency immediately preceding DM day amounted to M16.7 billion, of this M15.2 billion was notes with the rest being coinage. This represented approximately M1000 per head of the population. Given that currency in circulation per head in the FRG was considerably larger than this, at approximately DM2600, it was decided to over rather than under estimate demand and hence the plans provided for DM27.5 billion to be available for GDR residents. Only DM202 million of coinage was available in the early days of July, however.

Money paid in at branches in the former GDR currency had to be counted and checked for authenticity and fitness for circulation. The high speed automated processing machines used for checking and counting in the FRG were not available in sufficient quantities in the East because of long delivery times, and in addition some branches were not sufficiently modern to deal with them anyway, for size or technical reasons. This limited processing capacity had to deal with large quantities of inpayments in the first few weeks of July because of consumer goods purchases and the initial start up problems with the new cashless payments system.

The return flows of Marks after conversion had to be surrendered to financial institutions and eventually to the State Bank for checking and destroying.

The technicalities of conversion were rather long-winded, but this largely stemmed from the special conversion factors which were adopted. Cash conversion was ruled out. Conversion therefore took place entirely through accounts with financial institutions, with there being no direct currency exchange. All Marks had to be paid in on or before the 6th July and the balances had to be reported by the same date. To provide an initial stock of cash for everyday needs GDR residents were able to obtain DM denominated payment vouchers in advance which were debited against their accounts. On July 1st and 2nd it was possible to convert these into DM at some 10,000 paying offices. Cashless DM payments were suspended between the 2nd and 8th of July to enable all items in transit to be cleared, with EDP conversion being carried out on the 7th and 8th of July. 24.7 million accounts were converted as at June 30th 1990.

III Conclusion

A look at these two experiences makes it clear that currency changeover can be successfully accomplished with a minimum amount of disruption if the new system is spelt out in detail at an early stage, thus providing a relatively long time horizon for the planning and implementation of any changes necessary, but that even if a very short time horizon is involved large scale disruption does not result. In the case of decimalisation the cost of the changeover, in terms of converting and replacing machines and the minting of coins, would appear to have been in the order of 0.25% of annual GDP. This figure takes no account of the cost of converting computer based systems, however. No estimate of this aspect of the total cost was ever made, although it is clear that the DCB considered making these changes 'a lengthy and onerous task necessitating complete reappraisal of existing systems'.

A number of issues are also raised which directly relate to the introduction of the Ecu.

Physical constraints involved with the production of the new currency can be overcome by building new mints and printing works. Nevertheless, the minting of all the new coins will still take a considerable time, probably years rather than months. The size, weight, composition, etc. of these coins therefore needs to be specified early so that the minting exercise can begin. Moreover, allowing the minting process to begin early will minimise the impact in terms of increased demand for copper and nickel. While the printing of notes can be accomplished more quickly, the scale involved again suggests that early specification would be advantageous.

Specifying the new coinage at an early stage will clearly aid machine manufacturers, but it would appear that making the necessary changes in this area can be accomplished relatively smoothly without a long lead time, although some changeover period will be required. in addition, since most machines now operate in decimal it seems likely that the timescale required, and possibly the changeover period, could be shorter for E-day than D-day. With a resultant reduction in the estimated cost of this element of the changeover.

The date for introduction of the Ecu as legal tender in all member states (E-day) does need to be set as soon as possible, however. Only once there is a firm date for E-day will many of the organisations which will be concerned with eventual changeover begin to make the necessary plans.

Since conversion rates will not be known until the beginning of Stage III, it will not be possible to put the Ecu into circulation before this point. Furthermore, it seems very unlikely that old and new currency will have exact equivalences. This again points to a changeover period being required following E-day.

It has been suggested that the banking sector would find it very difficult to operate in two currencies. Since this is the case banks will have to convert, probably on E-day. This conversion exercise could necessitate a period of up to a week in which banks would not be open for normal operations. In determining the exact date for E-day consideration needs to be given to the volume of transactions

processed by banks, both within the year and within the month. Mid-month would appear to be the least busy period. In addition, it will not be possible for banks to have all the necessary framework for changeover in place at the beginning of Stage III because it is only at this point that the conversion rates become known. Therefore, it seems very unlikely that E-day can coincide with the start of Stage III.

Both a publicity campaign aimed at informing the general public of the new currency and conversion rates, and dual pricing, will almost certainly be necessary in the run up to E-day. There would also appear to be advantages in supplying cash handling organisation with the new currency in advance of it becoming legal tender. Again these factors suggest that E-day cannot occur at the beginning of Stage III.

Since all notes and coins will eventually need replacing the direct cost of introducing the Ecu, in terms of producing the new currency, is likely to exceed 0.25% of annual Community GDP. Hence be of a similar order of magnitude to the transaction cost saving associated with a single currency, as estimated by Emerson et al. In addition, however, the cost to companies of making all the necessary changes to computer based systems could also be substantial.

THE INTRODUCTION OF THE ECU BY COMPANIES

The replacement of European Community members' national currencies with the Ecu will have an impact on the financial activities of all economic agents. Nevertheless, apart from the production of the new currency and the introduction of the appropriate legislation, most of the technical changes required for the EC to operate in a single currency will involve the corporate sector. As well as making any internal changes necessary for Ecu operations individual companies will be responsible for the mechanics of the changeover in terms of the production of any new machines required, the provision of the necessary expertise, and the issuance of the new currency. Increased use of the Ecu in the transition, if it is to occur, will also be driven by the corporate sector. Furthermore, previous research has suggested that the main benefits from adopting a single currency will accrue through the effect which it has upon companies and their interaction in the market place. It is therefore the intention of this report to concentrate upon the implications of the adoption of the Ecu for the corporate sector.

In order to address the complex issues involved in the move to a single currency the discussion which follows sets out the way in which firms will have to operate once the Ecu replaces national currency. Identifies the changes which will be necessary for this move to occur smoothly, and what sort of timescale is involved. Gives an indication of the cost of the changeover exercise for different types of firms, and considers whether there is likely to be widespread use of the Ecu in the 'transitional period'. This phrase is used to represent the entire period up until the Ecu becomes legal tender, and therefore covers Stages I, II and III of EMU.

Initially there is a look at the range of machines which are used for financial transactions to see what implications there may be for producers and users. Next consideration is given to the operations of industrial and commercial companies (ICCs). Here the analysis looks at four different types of ICCs because the implications seem to differ for each. The distinction of importance for ICCs appears to be size and operating structure of the organisation concerned, rather than its market location, hence this is the format adopted. Finally, the banking sector is considered separately.

I Methodology

Stage I of this project involved the authors in desk research and telephone interviews with a small number of companies. The objective at this stage was primarily to determine the areas of a companies operations which would be affected if the Ecu were to be introduced as the single European currency. This culminated in the production of three separate, although related, questionnaires. One each for industrial and commercial companies, banks, and other organisations (see Appendix II). These questionnaires were designed to be completed partly by an appropriate Finance Director and partly by the relevant Systems Manager, since it became apparent very early on that many of repercussions of adopting the Ecu would involve computer based systems. In addition, it became clear that the project would benefit from the aid of a computer systems expert (see Appendix III).

At the outset of this program of study it was evident that only a small cross-section of the relevant population could be sampled. The sampling frame chosen was therefore based upon the National Institute Panel, with this being supplemented to give as wide a coverage as possible and to ensure that the sample had a European dimension. This effectively gave some 80 companies to be sampled (see Appendix IV), and a questionnaire was sent to each with an accompanying letter. Approximately 50% of those sampled, some 40 companies including 4 banks and 7 small companies, returned the questionnaire. A very good response rate given the nature of the questions involved. Almost all of these companies had attempted to answer the questionnaire in detail, although a number were reluctant to put detailed cost estimates and some added a caveat indicating that their response should be considered a first attempt at addressing the issues raised. In some cases these responses were followed up with detailed interviews to give further information on particular topics of interest and to ensure that the final results were unbiased.

In addition, four companies were identified which were willing to devote some of their resources to answering the questions raised and this allowed a more in depth analysis of some of the issues. These formed the basis of the case study approach, and enabled the authors to get a much better understanding of the nature of the changes necessary and the likely timescale involved, since face to face interviews are much more interactive than any other form of information gathering.

Given the responses to the questionnaire and the information obtained from the follow up interviews it was decided that the most appropriate method for presenting the results would be that of categorising companies according to certain characteristics. Since these characteristics appeared to be of considerable importance in determining the impact on companies of adopting the Ecu. Individual respondents do not always fall clearly into any one of these, however, and in addition there is some overlap. Hence what follows should be considered a synthesis of the information obtained and views expressed.

II Producers and Users of Machines

The introduction of the Ecu will involve a completely new set of notes and coins. And a look at the experiences of the UK in the run up to decimalisation indicated that a lot of concern centred around the changes required for machines to be able to work with the new coinage. This sub-section therefore discusses the implications for machine producers and users.

Ecu operations

There are a large number of different machines used for financial transactions, but most fall into one of three distinct categories. These categories are listed below together with the sorts of machines which they encompass. All will need to be able to operate in Ecu at the point at which national currency is abolished.

a) Recording machines

(i) Cash registers
(ii) Adding machines
(iii) Price computing scales
(iv) Accounting machines
(v) Petrol pumps

b) Coin machines

(i) Vending machines
(ii) Ticket machines
(iii) Telephone boxes

c) Note machines

(i) Counting machines
(ii) Cashpoint (ATM) machines

Current mode of operation

At present almost all of these machines operate only in national currency. Technically, however, it is not always the case that the currency itself is important. A number of recording machines no longer identify the unit of account. Where they do it is either pre-programmed in the machine or simply an external symbol. Coin recognition machines rely upon an internal coin recognition mechanism which has increasingly become electronic. Where this is the case new coinage can be incorporated by

resetting the mechanism. Similarly, tolerances for note recognition machines can be reset to deal with different sized banknotes.

Changes in the transitional period

Although most of these machines can easily incorporate national currency changes operating in two currencies would still be very difficult. This suggests that changes in the transitional period will largely be aimed at smoothly eventual conversion. There remains the question, however, of whether a gradual or instant changeover should occur.

a) Recording machines

Ease/difficulty of making the necessary changes to recording machines for them to use the Ecu will hinge upon whether they operate with a decimal system broken into 100 units. All producers and users we have interviewed indicate that this is case. Hence the most that will be required for operation in Ecu will be the resetting of any price data held in the machine and/or a symbol change. Nevertheless, it is instructive to note the caveat about the operation of the current system. If these machines are unable to break down the larger unit of account then replacement will be necessary. At present it seems unlikely that this will pose a major problem, but further research is suggested looking in detail at these machines in Italy.

One aspect of the conversion exercise in this area requires further consideration, however. This is the possibility of confusion over the unit of account being used on and immediately following changeover, and the additional organisational problems which could therefore be caused. Since most machines no longer indicate the unit of account, and all operate in decimal, there is the potential for a large number of recording errors. This suggests that dual operation with old and new currency being legal tender could lead to much confusion. Either this situation should be avoided or the machines in question need to make clear the unit of account being used.

b) Coin machines

Since coin recognition mechanism are increasingly becoming electronic, with the flexibility to be reset on the introduction of any new coinage, the changeover for a large number of these machines should simply involve a manual resetting exercise. Where the coin recognition mechanism remains mechanical, however, replacement would be required.

Nevertheless, it seems very unlikely that the resetting of these machines could be done overnight. This suggests that a period is required in which both old and new coinage is legal tender.

c) Note machines

These are principally used by the financial sector. Indications are that most if not all are electronic in nature, and hence would simply require resetting once the new currency is introduced.

Technically these are very easy to change, with it only being necessary to reset the tolerances. If the intention is to operate with dual currencies for a period clearly some will need to remain set for old notes while others will need to deal with the new currency. The exact balance depending upon the phasing in/phasing out exercise.

Cost and timescale

a) Recording machines

Looking at the modifications required to these machines indicates that changeover for most of the EC could be accomplished almost overnight, with very little cost. However, the Italian experience needs to be investigated in more detail, and if necessary producers and users should be encouraged to begin

the replacement exercise early, since this could take up to two years to complete. Then on changeover at most a symbol alteration would be needed.

b) Coin machines

Here again there are indications that the majority of the EC can accomplish the changeover exercise relatively quickly and with little cost. Where the coin recognition mechanisms remain mechanical replacement with electronic components could aid eventual conversion. Clearly this is more costly and, depending on the scale of the exercise, up to a year could be necessary for replacement. Furthermore, on introduction of the new coinage a period of around three months would probably be required to carry out all the manual resetting.

c) Note machines

Resetting of these machines could probably be done overnight. There will be costs, however, if both currencies remain legal tender for a time. These will take the form of inefficiencies arising from a smaller number of machines operating in each of the currencies concerned.

Resulting benefits

While the preceding sub-section makes clear that where some sort of replacement exercise is necessary early replacement should be encouraged, there seems little indication that the changes in this area will result in either cost savings or revenue generation. Hence the object of the exercise should be to minimise the actual cost of changeover by specifying the regime which will be in operation up until the point at which national currency is abolished, and ensuring that users of these machines have planned appropriately for the changeover.

III Large Multinational Industrial and Commercial Companies

Ecu operations

It is informative at this stage to begin by considering the major functions of a multinational based in the EC and the ways in which each of these will have to operate from the point at which national currency ceases to exist. Details are provided below.

a) The sales and marketing department

(i) All prices of products and services will have to be in Ecu.
(ii) An Ecu price list will be required, and all existing and potential customers will have to have this price list in their possession.
(iii) All negotiations on contracts will be in Ecu, and existing contracts will have to be converted.

b) The finance department

(i) Billing of all products and services will have to be in Ecu, with all invoices produced and issued in Ecu.
(ii) All suppliers and contractors will similarly have to be paid in Ecu.
(iii) All bank accounts in the EC will have to be converted and then maintained in Ecu.
(iv) All accounting and book-keeping will have to be in Ecu, with the presentation of accounts and balance sheets in Ecu.
(v) Treasury operations will involve only one currency within the Community.

c) The personnel department

(i) All employees will have to be paid in Ecu.

d) Production

(i) All internal trade will have to be carried out in Ecu, with internal transfer prices in Ecu, themselves based upon cost analyses of each plant in Ecu.

e) Planning

(i) Any management information systems designed to monitor the performance of the overall organisation and which use monetary values will need to be based around the Ecu.

Current mode of operation

Most multinational corporations appear to operate with some sort of decentralised structure. Hence the functions identified have a separate head office and operating unit dimension. It is therefore important to determine the extent to which each dimension can be considered multi-currency.

(a) The sales and marketing department

(i) Prices of products and services

A reference price is usually set by head office in one particular currency, based on an average mark-up, and individual operating units are required to price within a particular band of this reference. It was suggested that the band existed so that account could be taken of local market conditions. The most widely used reference currencies appeared to be either that of head office or the dollar, although the Ecu is used by some organisations.

Prices quoted by individual operating units seemed to be predominantly in the local currency. Where cross-border trade would be involved there also appeared to be a willingness to quote in the customer's currency. Indeed it was suggested by some that this was a necessity. In this particular area it appears that both head office and individual operating units therefore quote in a range of currencies, and have the ability to convert prices from one currency to another.

(ii) Price lists

Although it is head office which sets the reference price, given the flexibility which is usually afforded to individual operating units, a number of separate price lists exist. Price is not the only reason for this, however, in addition there are language and cultural differences.

(iii) Contractual arrangements

The organisation as a whole will be involved with conducting negotiations in a number of currencies. Nevertheless, these negotiations will usually be undertaken by individual operating units, and hence tend to be in a much narrower range of currencies.

b) The finance department

(i) Billing system

It was suggested that this particular function was usually the domain of individual operating units and therefore principally involved local currency, but that the system was still multi-currency. Clearly, if head office is responsible for billing the system will also be multi-currency.

(ii) Payments system

While the relationship between the operating units and individual suppliers/contractors can be more localised in nature most systems for payment still appeared to have a multi-currency dimension.

(iii) Banking

Except in a very decentralised system this seems to remain under the control of head office, with the majority of funds maintained in a particular currency.

In addition, financing of loans tends to be predominantly in the head office's currency, although other currencies are used including the Ecu. The same is true for capital contributions, although there are a small number of companies which already denominate their capital in Ecu.

A translation cost therefore exists whenever funds are transferred from operating unit to head office or vis-versa. This cost was not considered to be excessively large, however, because of the size of the transfers involved.

(iv) Accounting and book-keeping

The accounting systems appear to have a single currency and multi-currency dimension. The first designed to fulfil individual countries reporting requirements, and the second to allow conversion into a single common currency for head office monitoring. This common currency is usually that of head office.

(v) Treasury operations

Covering exposure in EC currencies did not seem to be a principal concern of treasury teams. The major focus appeared to be managing dollar exposure.

c) The personnel department

(i) Wages and salaries

The systems necessary for the payment of employees appear to be based solely around the national currency of the operating units.

d) Production

(i) Transfer prices

Internal trade involves the conversion to a common currency of transfer prices in a number of currencies. Again this common currency is usually that of head office, although a small number of companies do use the Ecu.

e) Planning

(i) Information systems

These systems within a multinational will already deal in a number of currencies and be able to convert to a single currency for monitoring purposes. The single currency again usually being that of head office.

As we can see a common currency is used in a number of areas by multinationals, with this being principally the national currency of head office, but some systems remain single currency. All the functions identified also rely upon custom built computer systems. In addition, use of the dollar appears to be less widespread than previous studies have suggested. Next we consider the changes which are possible, and likely, within such a structure.

Changes in the transitional period

In what follows three important distinctions are made when referring to computer based systems. Automated change is used to indicate that financial data can be modified within the companies existing software by a user. Manual change refers to modifications to financial data held within existing software from outside of this by a systems expert. Finally, software change is used to indicate where not only the data held but also the system using it would need modification.

(a) The sales and marketing department

(i) Prices of products and services

There was a clear indication from our study that those multinationals using dollar reference prices would prefer a more stable alternative. Their reluctance to change appeared to stem partly from the existence of large scale operations outside the EC, and partly from a wish not to use any individual EC currency. Where the latter is most significant the Ecu would appear to be the natural choice. Some of the companies surveyed during this exercise indicated that they are considering this option. This suggests that as the details of monetary union become firmer use of the Ecu for reference pricing is likely to increase, although it also suggests that the dollar will still be used by some companies. Where the Ecu is used bands will then be set around the Ecu rate, and narrowed "as and when appropriate". Since the current pricing system is already multi-currency the change should be completely automated with very little cost. This is borne out by evidence from the pan-European companies which already use the Ecu as a reference that few problems were encountered in the making the necessary changes.

Those companies using head office currency for reference prices seemed to have given use of the Ecu much less consideration. This probably stems from the fact that fluctuations in EC currencies are relatively small. It was suggested by some that a move to the Ecu would only be contemplated when a firm date for abolition of national currencies had been set, although if the change were to occur it would again be automated, with very little cost.

Differential pricing is likely to continue, however, even if the Ecu formed the reference price, because of differences in local market conditions. It was suggested that individual operating units would therefore continue, at least initially, to quote prices only in national currency. Dual pricing, that is quoting prices in Ecu, as well as local currency, would only occur at the point at which the organisation as a whole considered it feasible and beneficial to be paid in Ecu on a large scale. Even at this stage local Ecu prices were expected to differ, however.

(ii) Price lists

Initially it would appear that these will continue to be in national currency despite increased use of the Ecu as the reference. At some point there was the expectation of showing prices in Ecu and local currency, but even at the end of the transitional period, when prices are quoted only in Ecu, separate lists will still exist because of cultural and language difference, and local Ecu prices could still differ.

(iii) Contractual arrangements

Entering into Ecu contracts does not appear to present a particular problem, and there were indications of a willingness to do so if the customer had a strong preference for such a contract. However, it was suggested that active encouragement of such arrangements would only occur once the organisation considered Ecu payment on a large scale a distinct possibility.

Conversion of existing contracts, which were initially in currencies which would cease to exist, was considered a rather more complex problem, particularly when a company in the EC had entered into an agreement with one outside. The most sensible approach to this seems to be the inclusion of a conversion clause, but it was clear that this would not be added until the date of abolition had been set.

b) The finance department

(i) Billing system

Where this function comes under head office control there are clearly benefits, in terms of simplification of the system and reduction in translation costs, from invoicing and receiving large scale payment in a single currency. However, our survey suggested that billing was usually the responsibility of individual operating units, and primarily in local currency. Where this is the case total benefits to the organisation will be smaller because of the fragmented nature of the operation. In addition, in both cases small scale invoicing and payment in an additional currency simply adds to administration costs.

Technically the multi-currency nature of the system will mean that the Ecu can be easily incorporated with no software changes being required, and production and issue of invoices in Ecu should not present a problem. Indeed, it has already been indicated that most multinationals are willing to negotiate contracts in Ecu.

It was suggested, however, that active encouragement of Ecu payment from customers would not be contemplated until the organisation concerned had established that a minimum critical mass could be attained. In addition, a number of companies indicated that their customers would probably still want to pay in their local currency.

(ii) Payments system

Since this aspect of the multinational's operation tends to be more localised in nature, large scale payment in Ecu seems unlikely. Where cross-border trade is involved there may be slight gains from using a single currency, but even here there seems little likelihood of a concerted drive for Ecu payment until it has become widely used for billing, and funds begin to be maintained in Ecu. Technically, automated conversion will again be possible, but the incentive to change may be lacking.

(iii) Banking

Ecu banking on a large scale by these types of organisation will only follow from increased use of the Ecu for billing and payment. This suggests that it will be at most very gradual.

Clearly financing of capital contributions and loans in Ecu also only becomes a viable proposition at this stage.

Again it would appear that it is not the technical side which is difficult, rather the incentive is lacking. Indeed, the experiences of the limited number of companies which already use the Ecu in this way suggests that the transition can occur very smoothly.

(iv) Accounting and book-keeping

Whether Ecu accounting and book-keeping becomes a reality in the transitional phase will depend partly upon the extent to which the organisation adopts the Ecu in other areas, but also upon the legislative framework. If changes occur in other areas of the company the incentive increases, and if legislation permits there should be few modifications required to the existing system, with automated conversion again most likely, but it was suggested that there could still be some administrative problems in the short term.

(v) Treasury operations

Since exchange rate variations are expected to narrow during the transitional period there is likely to be a decrease in deals involving two EC currencies. But since these do not appear to be widespread at present, in practical terms there will be little change. EC currency and dollar deals will remain prominent, and it seems doubtful whether the Ecu will be used instead because it is unlikely that the basket will match the organisation's asset distribution.

c) The personnel department

(i) Wages and salaries

Since most of the systems necessary for the payment of employees operate in national currency change in this area will be considerably more difficult. Automated conversion seems very unlikely and there seems to be little immediate benefit from making software changes. Manual conversion will therefore be required, and during the transitional period the organisation will be gearing up for eventual conversion.

d) Production

(i) Transfer prices

Use of the Ecu for transfer pricing will only follow from use by the finance department, although automated conversion should be possible because the system will already be multi-currency.

e) Planning

(i) Information systems

As in most other areas of operation these systems within a multinational will already deal in a number of currencies and be able to convert to a single currency for

monitoring purposes. It is very unlikely that any modifications would therefore be required to existing software to facilitate use of the Ecu, and conversion will probably be automatic. Nevertheless, use of the Ecu will only follow from use in other areas of the company's activities.

This suggests that a number of areas of a multinational corporation's operations have the flexibility to easily move to using the Ecu if desired. What seemed to be lacking was an overwhelming incentive to make the change. Initially it seems most likely that Ecu reference prices will be adopted by some organisations. Subsequently some sort of dual pricing may be adopted, but use of the Ecu by the finance department appeared to hinge upon whether being paid and paying in Ecu could attain some critical mass, and there seemed to be doubts whether this would occur. In addition, only subsequently will the Ecu be used on a large scale for raising capital.

Differential price setting behaviour seems to be less pronounced for multinationals than other types of firms, and also seems to be smaller for intermediate and investment good producers than for consumer good producers. Nevertheless, there seemed to be an expectation of continued price difference in local markets, even if they were in Ecu.

Cost and timescale

Most of the functions identified as eventually needing to operate in Ecu involve information stored on computer based systems, with the large majority of these being custom built. In addition, there is considerable interaction between these systems, suggesting that a co-ordinated policy of change may be required. However, the preceding discussion seems to indicate that adopting the Ecu within a multi-currency framework will be completely automated and very straightforward. The user will be able to specify the additional currency and conversion rate with the system handling the rest. It was suggested that a period of approximately three months would be required for all the systems which are currently multi-currency to begin functioning in Ecu, because of the co-ordination exercise involved. Cost was not considered very large, with estimates ranging from Ecu 50,000 to Ecu 250,000. Furthermore these estimates did not appear to relate in any linear way to overall size of the organisation. For multinationals the largest single task would appear the conversion of the payroll system in each operating unit. It was suggested that the cost and time involved in planning and making changes in this area would be considerable. Of the companies approached very few were able to go beyond the stage of indicating the likely timescale necessary for conversion. Here the minimum suggested was 12 months and the maximum 2 years. A small number of cost estimates were given ranging from Ecu 500,000 to Ecu 2 million. Again these did not appear to relate to overall size of the organisation concerned. In an attempt to get a better understanding of the manual conversion exercise involved appendix III looks in detail at the changes required to computer systems. Using this information and the system details supplied by companies indicates a cost in the order of Ecu 2 million.

Resulting benefits

The immediate advantage of adopting the Ecu as a reference price in preference to the dollar was considered to stem from its stability. However, EC currencies are themselves relatively stable, and as Stage III of EMU approaches this stability should increase. Hence there appears to be little additional benefit in moving from an existing EC currency to the Ecu in the transition.

A larger benefit was anticipated as a result of a reduction in administration and translation costs from having funds in a single currency throughout the EC. Those organisations surveyed doubted whether this change would occur during the transitional period, however. Estimates of the eventual cost savings ranged from 0.1% to 0.5% of total EC transactions.

The increased transparency resulting from having input prices quoted in Ecu throughout the EC was considered of marginal benefit, but quoting prices in Ecu was not seen as in any sense beneficial its in its own right.

In the very long run it is possible that an additional factor should be added to this list. This is the ability a single currency throughout the EC would give the multinational to centralise the billing, payment and payroll systems. That economies of scale exist with regard to these function is evidenced by their centralised nature in most national companies. Whether it is contemplated, however, will depend principally upon how easy it would be to deal with the tax questions involved.

IV Large National Industrial and Commercial Companies which Trade

Ecu operations

Again we begin by looking at the major functions of a typical national trader and the ways in which each of these will have to operate from the point at which national currency ceases to exist.

a) The sales and marketing department

(i) All prices of products and services will have to be in Ecu.
(ii) An Ecu price list will be required, and all existing and potential customers will have to have this price list in their possession.
(iii) All negotiations on contracts will be in Ecu, and existing contracts will have to be converted.

b) The finance department

(i) Billing of all products and services will have to be in Ecu, with all invoices produced and issued in Ecu.
(ii) All suppliers and contractors will similarly have to be paid in Ecu.
(iii) All bank accounts in the EC will have to be converted and then maintained in Ecu.
(iv) All accounting and book-keeping will have to be in Ecu, with the presentation of accounts and balance sheets in Ecu.
(v) Treasury operations will involve only one currency within the Community.

c) The personnel department

(i) All employees will have to be paid in Ecu.

d) Production

(i) All internal trade will have to be carried out in Ecu, with internal transfer prices in Ecu, themselves based upon cost analyses of each plant in Ecu.

e) Planning

(i) Any management information systems designed to monitor the performance of the overall organisation and which use monetary values will need to be based around the Ecu.

Current mode of operation

What becomes clear when looking at national companies which trade is that a much more centralised structure exists.

(a) The sales and marketing department

(i) Prices of products and services.

Two sorts of pricing policy appear to be in evidence. Either dual pricing, in national currency and in the currency which is most widely used for invoicing within the industry concerned - again most probably dollars. Or multi-pricing, where prices are quoted in a range of currencies. What seemed to be suggested was that a number of companies were adopting the latter as they upgraded their systems. This change seemed to be occurring partly because of a wish to move away from dollar based prices where possible, but also because it increased the organisation's flexibility. Differential pricing in local markets again seemed to quite pronounced, and it was suggested this more than covered the translation and freight costs involved.

(ii) Price lists.

A number of separate price lists appear to exist each geared up to the local market and reflecting current differentials. Price is not the only reason for this, however, in addition there are language and cultural differences.

(iii) Contractual arrangements

Given the move to a multi-pricing framework the organisation as a whole is likely to be familiar with conducting negotiations in a range of currencies.

b) The finance department

(i) Billing system

Again the suggestion is that most of these systems are multi-currency, irrespective of whether prices are quoted in two or a number of currencies.

(ii) Payments system

While it is possible that this sort of company relies solely on suppliers/contractors located within national boundaries, this did not appear to be true of the companies surveyed here. The indication was, therefore, that this function was also multi-currency.

(iii) Banking

Funds will almost always be maintained in local currency.

In addition, financing of loans tends to be predominantly in the in the same currency, although other currencies are used on occasion. The same is true for capital contributions.

(iv) Accounting and book-keeping

The accounting systems of most companies which trade appear to be single currency, with national currency almost always used for presentation of accounts and balance sheets.

(v) Treasury operations

Some national traders run treasury teams to manage their foreign exchange risk, but a number do not appear to fully cover their exposure.

c) The personnel department

(i) Wages and salaries

The systems necessary for the payment of employees will usually be based solely around national currency.

d) Production

(i) Transfer prices

Internal trade will again be in national currency.

e) Planning

(i) Information systems

These systems within a national trader are again likely to be in a single currency.

This gives an indication of the way in which a national trader will operate at present. All the functions identified rely upon custom built computer systems. What is clear is that national currency is by far the most widely used, but that a number of systems still have multi-currency capabilities. Furthermore, it appears to be the accounting, payroll, intra-firm trade and monitoring systems which are single currency.

Changes in the transitional period

Three distinctions are again made when referring to computer based systems. (Automated, manual and software changes.) If this sort of organisation were to choose to move from a single to a multi-currency system this would inevitably involve software changes. Such changes should be put in context, however. It appears that software changes are made approximately every four years within most large companies, although much of the intervening period is given over to preparing for these changes.

a) The sales and marketing department

(i) Prices of products and services

Since the large majority of these companies appear to be quoting prices in a range of currencies, using Ecu prices should not be very difficult, and any conversion is likely to be automated. Nevertheless, since differential pricing in individual markets exists, and was expected to continue for some time, it was suggested that there was little immediate benefit from quoting prices in Ecu. Indeed the increased transparency which would result was considered by some to be detrimental. The incentive for quoting prices in Ecu in addition to local currency, was perceived as only existing when the organisation as a whole considered it feasible and beneficial to be paid in Ecu on a large scale. It should be noted, however, that even at this stage a single set of prices throughout the EC was not being considered.

(ii) Price lists

Initially it would appear that these will remain in local currency. If large scale Ecu payment became a reality there were indications that lists would show prices in Ecu as well as local currency, but these prices were still expected to differ in individual markets. And even at the end of the transitional period when prices are quoted only

in Ecu, separate lists will still exist because of cultural and language difference, and local Ecu prices could still differ.

(iii) Contractual arrangements

Entering into Ecu contracts does not appear to present a particular problem, and there were indications of a willingness to do so if the customer had a strong preference for such a contract. However, it was suggested that active encouragement of such arrangements would only occur once the organisation considered Ecu payment on a large scale a distinct possibility.

Conversion of existing contracts, which were initially in currencies which would cease to exist, was considered a rather more complex problem, particularly when a company in the EC had entered into an agreement with one outside. The most sensible approach to this seems to be the inclusion of a conversion clause, but it was clear that this would not be added until the date of abolition had been set.

b) The finance department

(i) Billing system

Technically the multi-currency nature of the system will mean that the Ecu can be easily incorporated with no software changes being required, and production and issue of invoices in Ecu should not present a problem. Indeed, it has already been indicated that most of these companies are willing to negotiate contracts in Ecu.

It was suggested, however, that active encouragement of Ecu payment from customers would not be contemplated until the organisation concerned had established that a minimum critical mass could be attained. Only at this point would any benefits in terms of simplification of the system and reduction in translation costs, from invoicing and receiving large scale payment in Ecu, begin to accrue. In addition, a number of companies doubted whether customers would be willing to adopt such arrangements.

(ii) Payments system

Since this aspect of a national trader's operation tends to be more localised in nature, large scale payment in Ecu seems unlikely. Where cross-border trade is involved there may be slight gains from using a single currency, but even here there seems little likelihood of a concerted drive for Ecu payment until it has become widely used for billing. Technically, automated conversion will again be possible, but this indicates that the incentive to change may be lacking.

(iii) Banking

It seems very unlikely that this sort of organisation will maintain Ecu bank accounts on any large scale. However, if there is increased use of the Ecu for billing and payment some funds may be maintained in this way. This suggests that at most there will be a very gradual.

Financing of capital contributions and loans in Ecu on a large scale also seems unlikely.

Again it would appear that it is not the technical side which is difficult, rather the incentive is lacking.

(iv) Accounting and book-keeping

In this area there appear to be two possibilities, eventual manual conversion or software changes. Given the discussion above it seems very unlikely that this sort of company will adopt the Ecu on any large scale during the transitional period. This suggests that there are few advantages from changing the computer software, and that manual conversion will occur, with the company gearing up for this changeover.

(v) Treasury operations

Since exchange rate variations are expected to narrow during the transitional period there is likely to be a decrease in deals involving two EC currencies. However, it was suggested that because fluctuations are currently relatively small this was the area where risk was not completely covered. EC currency and dollar deals will remain prominent, and it seems doubtful that the Ecu will be used instead because the assets of the organisation are denominated in national currency.

c) The personnel department

(i) Wages and salaries

All the systems necessary for the payment of employees operate in national currency. Manual conversion will therefore be required, and during the transitional period the organisation will be gearing up for eventual conversion.

d) Production

(i) Transfer prices

Again this is likely to involve manual conversion since there appear to be few if any benefits from moving to the Ecu in the transition.

e) Planning

(i) Information systems

This is also true for the information system.

This suggests that some areas of a national trader's operations have the flexibility to easily move to using the Ecu if desired. What seemed to be lacking was any particular incentive to make the change. Initially it seems most likely that Ecu prices will be quoted in addition to local prices. It is not clear, however, whether customers will opt to pay in Ecu.

Differential price setting behaviour seems to be more pronounced for this sort of organisation and there seemed to be an expectation of continued price differences in local markets, even if they were in Ecu.

Some areas will require manual conversion, however, since there appear to be few benefits from making software changes in the transition.

Cost and timescale

Again it was suggested that a period of approximately three months would be required for all the systems which are currently multi-currency to begin functioning in Ecu, because of the co-ordination exercise involved. Cost was not considered very large, with estimates ranging from Ecu 50,000 to Ecu 100,000. Four principal functions would require manual conversion, however. Accounting and book-keeping, wages and salaries, transfer pricing and monitoring. Estimates of the time required to make

these changes varied between 12 months and 3 years. Some estimates of cost were also given and these ranged from Ecu 250,000 to Ecu 1 million. Using the information contained in Appendix III and the system details supplied by companies allows us to make an alternative estimate of cost, and this suggests a total in the order of Ecu 500,000.

Resulting benefits

The major benefit for this sort of organisation was seen as a reduction in administration and translation costs from receiving, and to a lesser extent making, all cross-border payments in a single currency throughout the EC. All the organisations surveyed considered this to be the single most important factor, but they doubted whether this would occur on a large scale during the transitional period. Estimates of the eventual cost savings ranged from 0.3% to 0.6% of total EC transactions.
From the selling point of view quoting prices in Ecu was not seen as in any sense beneficial its in its own right. The transparency afforded by having prices quoted in Ecu when purchasing was considered of marginal beneficial, however.

V Smaller National Industrial and Commercial Companies which are Considering Exporting

Ecu operations

Again we begin by considering the major functions of an aspiring trader and the ways in which each of these will have to operate from the point at which national currency ceases to exist.

a) The sales and marketing department

(i) All prices of products and services will have to be in Ecu.
(ii) An Ecu price list will be required, and all existing and potential customers will have to have this price list in their possession.
(iii) All negotiations on contracts will be in Ecu, and existing contracts will have to be converted.

b) The finance department

(i) Billing of all products and services will have to be in Ecu, with all invoices produced and issued in Ecu.
(ii) All suppliers and contractors will similarly have to be paid in Ecu.
(iii) All bank accounts in the EC will have to be converted and then maintained in Ecu.
(iv) All accounting and book-keeping will have to be in Ecu, with the presentation of accounts and balance sheets in Ecu.
(v) Treasury operations will involve only one currency within the Community.

c) The personnel department

(i) All employees will have to be paid in Ecu.

d) Production

(i) All internal trade will have to be carried out in Ecu, with internal transfer prices in Ecu, themselves based upon cost analyses of each plant in Ecu.

e) Planning

(i) Any management information systems designed to monitor the performance of the overall organisation and which use monetary values will need to be based around the Ecu.

Current mode of operation

Since this sub-section is designed to address the issues facing an aspiring trader we start from a position where no trade occurs. It should be noted, however, that in forming these views we have been reliant as much upon information obtained from small companies which do trade as those which don't.

(a) The sales and marketing department

(i) Prices of products and services.

These will be purely in national currency and it is most likely that a single set of prices will exist covering the entire national market.

(ii) Price lists.

It follows from this that the company will have a single price list.

(iii) Contractual arrangements

Negotiations of contractual arrangements will also be purely in national currency.

b) The finance department

(i) Billing system

Similarly invoices will only be produced in national currency, with little likelihood that the billing system has a multi-currency dimension.

(ii) Payments system

Few companies which fall into this category will source from outside national boundaries. The payments system will therefore use only national currency and is very unlikely to have a multi-currency dimension.

(iii) Banking

Funds will always be maintained in national currency.

In addition, financing of loans and capital contributions will always be in national currency.

(iv) Accounting and book-keeping

The accounting system will use national currency, and it is very unlikely to have a multi-currency dimension.

(v) Treasury operations

No treasury department will exist.

c) The personnel department

(i) Wages and salaries

The systems necessary for the payment of employees will be based solely around national currency.

d) Production

(i) Transfer prices

Internal trade will again be in national currency.

e) Planning

(i) Information systems

These systems within an aspiring trader will also be in a national currency.

Not surprisingly all these functions will operate in a single currency. However, most of the computer systems involved will use package software, and the wages and salaries function may well be administered by a payroll bureau.

Changes in the transitional period

There appear to be two possibilities here. The company can begin trading only after the Ecu replaces national currency and hence carry out manual conversion of all systems, or it can begin trading during the transition. The more interesting case is clearly the latter and it is this which we concentrate upon. The most important motivational factor here appears to be the single market program, and the resulting reduction in the costs of cross border activity. Monetary union and the prospect of a single currency 'in the distant future' were not considered to be significant.

Entering the wider market in the transition will involve giving some aspects of operation a dual or multi-currency dimension. That is involve software changes. It appears, however, that even these sorts of organisations update their software approximately every seven years. In addition, those systems which remain single currency will eventually have to be manually converted.

a) The sales and marketing department

(i) Prices of products and services

There seems little doubt that this sort of company on entering a new market will have to set prices in local currency. If the market were familiar with using the Ecu then this would be a possibility, but the discussion above indicates that use of Ecu prices is unlikely to become widespread.

Although it would clearly be easier for the company concerned to use a single set of prices for all it exports, it will possess very little market power and hence be forced to follow the lead of those currently in the market. This suggests that it may well attempt to cover foreign exchange risk by charging higher prices in these markets. It could, of course, quote prices in local currency and the Ecu, and this would not present any technical problems, but it would make prices more transparent, and therefore seems unlikely unless large scale payment in Ecu is anticipated.

(ii) Price lists

A number of separate price lists will therefore be required and the company may well set different prices in each market. It does seem likely, however, that if a point comes when local and Ecu prices are quoted there will be an attempt to consolidate the overall pricing schedule, so that difference are ironed out.

(iii) Contractual arrangements

There is clearly an advantage from negotiating all export contracts in a single currency. However, since it is likely to be customers which determine the currency used there seems little likelihood of this occurring.

Conversion of existing contracts could again present a problem. Hence inclusion of a conversion clause would seem sensible. Although EC legislation could also cover such contracts.

b) The finance department

(i) Billing system

Once the organisation has decided to export it would appear that a multi-currency system will be used. Production and issue of invoices will therefore initially be in a range of currencies. From this point onwards, however, the Ecu could be used with few changes being required.

(ii) Payments system

There would appear to be little incentive to pay suppliers/contractors in Ecu. Technically a manual conversion exercise therefore seems most likely.

(iii) Banking

Funds are likely to continue to be maintained in national currency.

Similarly financing of capital contributions and loans.

(iv) Accounting and book-keeping

This area of operation is also likely to remain single currency and hence eventually require manual conversion.

(v) Treasury operations

It seems unlikely that such a company would decide to run a treasury team.

c) The personnel department

(i) Wages and salaries

Here again manual conversion will eventually be required, and during the transitional period the organisation will be gearing up for eventual conversion.

d) Production

(i) Transfer prices

National currency is likely to continue to be used for transfer pricing, and manual conversion will eventually have to occur.

e) Planning

(i) Information systems

Similarly for any monitoring systems.

What is suggested here is that a major incentive for a company based in one particular EC country to begin trading will come with the removal of non-tariff barriers. Furthermore, at this point pricing and receiving payment in a single currency would be very advantageous. However, it seems likely that these companies will have to price in local currency. To do this they will need to make some of their systems multi-currency. This will facilitate an easy move to the Ecu if required, but early adoption was considered highly unlikely. A number of systems will remain single currency, however, and eventually require conversion. Unless it is possible to receive payment in a single currency differential price setting behaviour is to be expected to cover risk and translation costs.

Cost and timescale

Adopting the Ecu once the organisation concerned is operating with multi-currency systems will be very straightforward. It was suggested that only a few days would be required to make the necessary changes, and that the cost of the exercise would be very small. Estimates of the costs involved in upgrading all the necessary package software ranged from Ecu 100,000 to Ecu 200,000. The conversion exercise was also considered to be relatively simple. With the suggestion that it would take only three months to complete, and that the cost would be in the order of Ecu 100,000. These smaller cost and shorter time horizon estimates seem to stem from the much more simplified nature of the company's operations. Furthermore it was suggested that conversion could probably be done in house, without the aid of a systems expert.

Resulting benefits

The elimination of translation costs which would result from being paid in Ecu was considered to be a major benefit. The previous discussion suggests that these benefits will only accrue once national currencies have been abolished, however.

Estimates from those companies already trading suggested eventual cost savings in the order of 0.5% of total EC transactions.

Since a large number of these sorts of companies appear to pursue differential pricing policies as a means of covering foreign exchange risk, some harmonisation of prices should also result.

VI Large Industrial and Commercial Companies which are Never Likely to Trade

Ecu operations

Again we begin by considering the major functions of a company which falls into this category and the ways in which each of these will have to operate from the point at which national currency ceases to exist.

a) The sales and marketing department

(i) All prices of products and services will have to be in Ecu.
(ii) An Ecu price list will be required, and all existing and potential customers will have to have this price list in their possession.
(iii) All negotiations on contracts will be in Ecu, and existing contracts will have to be converted.

b) The finance department

(i) Billing of all products and services will have to be in Ecu, with all invoices produced and issued in Ecu.
(ii) All suppliers and contractors will similarly have to be paid in Ecu.
(iii) All bank accounts in the EC will be converted and then maintained in Ecu.
(iv) All accounting and book-keeping will have to be in Ecu, with the presentation of accounts and balance sheets in Ecu.
(v) Treasury operations will involve only one currency within the Community.

c) The personnel department

(i) All employees will have to be paid in Ecu.

d) Production

(i) All internal trade will be need to be carried out in Ecu, with internal transfer prices being in Ecu, themselves based upon cost analyses of each plant in Ecu.

e) Planning

(i) Any management information systems designed to monitor the performance of the overall organisation and which use monetary values will need to be based around the Ecu.

Current mode of operation

Most of these functions will be centralised and currently use only national currency. Most of the computer systems involved will be custom built. Furthermore it seems unlikely, perhaps with the exception of the payment system, that any will have a multi-currency dimension.

Changes in the transitional period

For this sort of company a large scale manual conversion exercise will therefore be required.

(a) The sales and marketing department

(i) Prices of products and services.

The prices of the products and services of a company which falls into this category will currently only be quoted in national currency. Eventually they will similarly only be quoted in Ecu. At some point during the transition it seems likely that a dual set of prices will be required, however. Software change remains unlikely, however, since this could be accomplished by manual conversion of existing prices and maintenance of an extra file containing Ecu prices.

(ii) Price lists

Some organisations which fall under this heading produce large catalogues. At some point during the transition dual pricing in these catalogues will be required. This will add to costs, but probably not very significantly. Furthermore, no extra changes will be required at the end of the transition.

(iii) Contractual arrangements

The marketing department will only be familiar with conducting negotiations in a single currency. It is therefore likely that the negotiation of some contracts could take longer because of initial unfamiliarity with the new currency, but this should be at most a short term phenomenon.

Conversion clauses are again likely to be in most contracts, and if not legislation should cover the problem.

b) The finance department

(i) Billing system

The computerised billing system operating in this sort of organisation will be set up so that it can produce invoices in only national currency. Manual conversion to the Ecu will therefore be required.

(ii) Payments system

Manual conversion of the payments system for suppliers and contractors should be fairly easily accomplished once the payees are also dealing with the new currency.

(iii) Banking

Converting and then maintaining bank accounts in Ecu should not present a problem.

(iv) Accounting and book-keeping

The accounting systems is likely to be set up so that it deals only in national currency. Manual conversion into Ecu will be required, but it is again unlikely that the system would require any software modifications.

(v) Treasury operations

This type of organisation will not have a treasury function, nor will it require one on conversion.

c) The personnel department

(i) Wages and salaries

The payroll system will be set up to handle national currency. Manual conversion will therefore be required.

d) Production

(i) Transfer prices

Internal trade within this type of organisation will only involve transfer prices in national currency. Conversion to Ecu would therefore be required.

e) Planning

(i) Information systems

These systems will be set up to only deal in national currency. Conversion will therefore be required to facilitate the use of the Ecu.

Cost and timescale

The minimum time suggested for complete manual conversion was 2 years and the maximum 3 years. The systems analysis stage was itself considered a major exercise, which would not be contemplated until it was clear that national currency would be replaced. Cost estimates ranged from Ecu 1 million to Ecu 3 million. Using the information in Appendix III and the system details supplied by companies gives us an alternative estimate of cost in the order of Ecu 2 million.

Resulting benefits

The only benefit for this sort of organisation would appear to be the increased transparency of input prices quoted in Ecu.

VII Large Commercial Banks

While we recognise that most banks offer a range of financial services this section concentrates upon their core activities.

Ecu operations

Initially we attempt to spell out the way in which a large commercial bank will have to operate following the abolition of individual national currencies. These details are provided below.

a) Customer services

(i) All deposits will have to be denominated in Ecu.
(ii) Supply of finance will have to be in Ecu.
(iii) Money transmission will have to be in Ecu.

b) Processing

(i) All basic account holding information will have to be in Ecu.
(ii) Cheque sorting and recording (debits and credits) will have to be in Ecu.
(iii) Recording of standing orders (debits and credits) will have to be in Ecu.
(iv) Recording of cash dispenser transactions will have to be in Ecu.
(v) Setting of cash dispenser limits will have to be in Ecu.
(vi) Provision of statements to customers will have to be in Ecu.
(vii) Ecu chequebooks will be required.
(viii) Ecu cheque guarantee cards will be required.

c) Finance

(i) All accounting and book-keeping will have to be in Ecu, with the presentation of accounts and balance sheets in Ecu.
(ii) All suppliers and contractors will similarly have to be paid in Ecu.

d) Personnel

(i) All employees will have to be paid in Ecu.

e) Planning

(i) Any management information systems designed to monitor the performance of the overall organisation and which use monetary values will need to be based around the Ecu.

Current mode of operation

a) Customer services

(i) Deposit taking

Most deposits are denominated in national currency. Ecu sight and time deposits are offered by a number of institutions, but few customers make use of these options.

(ii) Supply of finance

The majority of loans are again in national currency, although foreign currency loans do form a sizeable proportion of the total. Ecu loans are offered by many banks, and this area has seen some growth over the last ten years, but total loans in Ecu remain small.

(iii) Money transmission

The vast majority of the items processed are in national currency and utilise, where necessary, national clearing systems. However, most banks, either directly or indirectly, have access to the Ecu clearing system and can therefore process Ecu items if required.

b) Processing

Most large banks offer services to customers in a range of currencies. Nevertheless, almost all of the elements in the processing system do not appear to be multi-currency. Instead, national currency operations run independently of any which involve foreign currencies, with the former representing by far the larger area of operation.

Changes in the transitional period

a) Customer services

Ecu services are already offered by many banks. To date, however, these have not been taken up on any large scale by customers. Whether this changes during the transition will clearly depend upon customer demand. The preceding sections suggest that demand may not grow particularly rapidly during this period. If this conclusion is wrong, however, there appear to be doubts whether the existing infrastructure could deal with the much larger provision of customer services in Ecu.

Furthermore national clearing systems would find it very difficult to function in a dual currency regime, and there appear to be doubts whether the existing Ecu clearing system could cope with a large increase in volume.

b) Processing

A similar argument extends to the processing systems involved. Software changes would be required for large scale use of the Ecu in the transition. In addition, the Ecu existing alongside national currency would require separate tills for each and extra reserves at each bank branch.

All this discussion seems to indicate that banks have little incentive to promote dual currency services during the transition. Instead they will be gearing up for a very large scale conversion exercise.

Cost and timescale

All of the processing systems used by banks appear to rely upon custom built computer systems. Identification of all the files requiring conversion was considered a very large task. Estimates of the time need to carry out manual conversion of all these systems ranged from 2 to 3 years. The cost involved, understandably, was considered to be much larger than for ICCs. Estimates ranged from Ecu 7 million to Ecu 10 million. If dual currency services were required during the transition it was suggested that these figures would more than double. It has not been possible to make an alternative estimate of the likely costs because of the difficulty of identifying all the necessary files.

Resulting benefits

There will clearly be a loss of the profit associated with exchange margins and commissions from the purchase and sale of EC currencies. These were not considered to be large, however.

On the benefits side there were suggestions that having assets and liabilities denominated in a single currency throughout EC could lead to expanded scope for asset creation, in the form of increased lending and investment.

VIII Conclusion

The preceding sub-sections attempt to integrate the findings of the four case studies and the results of the completed questionnaires. Given the detailed questions posed this approach seemed preferable to one which simply summarised responses.

The analysis indicates that most of the changes required by companies for them to be able to operate in Ecu involves modifications to information stored in computer systems. There are three ways in which the move to the Ecu can be accomplished. These are shown below. As can be seen the options depend upon the way the software of the company in question currently operates. The first of these, which involves adopting the Ecu within a system which is already multi-currency appears to be the most straightforward and require the least amount of time. The second, which would necessitate software changes, was considered to be the most costly and require the longest timescale to implement. The third, which involves manual conversion of all single currency data, was considered to be the least expensive way of moving to the Ecu and the one which would be adopted where the system was currently single currency, but was also deemed to be a largescale exercise where the company relied upon custom built systems.

Multi-currency ------> Ecu
Single currency ------> Multi-currency -----> Ecu
Single currency ------> Ecu

This suggests that the ease/difficulty of moving to the Ecu is dependent in part upon the flexibility of existing computer systems. In addition, complexity of operation also appears to be a very important factor, particularly whether companies operate within a centralised or decentralised framework. In the

latter case similar changes will be required in each operating unit. The table below summarises our main findings by indicating the maximum timescale required for the different sorts of organisations identified, and the likely cost. In addition it gives the number of company responses which were considered relevant when drawing up these figures.

Organisation	No. of responses	Timescale	Cost
Machine producer/user	9	3 months	Small
Large multinational	8	2 years	Ecu 2.25m
Large national trader	13	3 years	Ecu 1.1m
Small trader	7	3 months	Ecu 100,000
Large non-trader	7	3 years	Ecu 3m
Large commercial bank	4	3 years	Ecu 10m

We have chosen to present the maximum figures here because of the already mentioned caveat that these responses should be considered a first attempt at addressing the issues highlighted. (The minimum figures quoted appear in each sub-section.)

The timescale and cost estimates cover both the planning and implementation stages. The table suggests that it is predominantly the size of the organisation concerned which determines the timescale required. This stems from the use of custom built systems by most large companies. Small companies tend to rely upon package software and this makes changeover easier and less costly. Our survey did not suggest that cost was an exact linear function of size, however. The cost estimate for individual banks is considerably higher than for ICCs, but the timescale roughly the same. This suggests that the sheer magnitude of the changes required has a bigger bearing on cost than timescale.

In order to use this information to put together a timetable for the introduction of the Ecu two assumptions have to be made. Firstly that banks will change on E-day. Secondly, that this fact will encourage most other organisations to do the same. In the table below t is used to represent E-day, and the timings are given in months with reference to this point.

t-36	Planning by banks Planning by large national traders Planning by large non-traders
t-24	Planning by large multinationals
t-3	Planning by small traders
t	E-day, changeover by all above, and conversion by machine producers/users begins
t+3	Conversion of machines complete

Some of the necessary planning can be done without exact conversion rates being known. However, testing etc will only be possible once these rates have been determined, and the principles set for any rounding required. This suggests again that E-day cannot coincide with the start of Stage III. It is difficult to determine the length of time required for testing etc since no comparable exercise has ever been carried out, but indications from other areas involving system development suggest this needs to be carried out at least three months in advance, and preferably six. This view was supported by all the systems managers interviewed and our independent consultant.

Given these considerations the earliest possible date for E-day would appear to be mid-1997, with abolition of national currencies following approximately three months later.

For this to occur, however, the companies at the top of our list would have to begin to plan for changeover by mid-1994. The indications from these sorts of organisations were that they would not begin this exercise until the regulatory framework, including a firm date, had been put in place. This suggests that the date would need to be set only six months into Stage II. Furthermore, almost all the companies surveyed indicated that there would be additional costs if a shortened timetable was forced upon them. Estimates ranged from 10% to 33% of the total costs of the changeover, with the mean being approximately 25%.

In contrast to decimalisation, where much concern centred around machine manufacturers, the move to the Ecu will see a much bigger role for software manufacturers and systems consultants. Although we have no figures on this, it is possible that the sheer scale of the conversion exercise could stretch existing resources in this area. If this is the case then the timescales indicated, which are based on individual company estimates, could understate the actual time required for all firms to make the changeover.

Few companies expected to make widespread use of the Ecu in the transitional period. In some cases this stemmed from the additional costs which would be involved, but in a number resulted from the belief that neither customers nor suppliers would be making such moves, and hence Ecu operations would remain small scale. It would appear, therefore, that positive discrimination in favour of the Ecu would be necessary for large scale use in the transition.

RECOMMENDATIONS

The most important single finding of this project is that most companies will not act until a firm date for the introduction of the Ecu as legal tender has been set (E-day). The legislation which does this needs to specify the maximum timescale in which both the Ecu and national currencies will remain legal tender (the changeover period), before the latter is completely abolished, and indicate how existing contracts in national currency should be converted.

While much of the planning for changeover (once the date has been set) can occur within an environment of fluctuating exchange rates the exact conversion factors will need to be known some six months in advance so that computer programs set up to carry out the switch can be thoroughly tested.

The date for E-day will therefore have to be at least six months into Stage III. Subsequently, there will need to be a changeover period which lasts for at least three months.

To carry out all the necessary planning and to ensure that a smooth changeover occurs a period of around three years will be required, the last six months of which must to be in an environment of 'irrevocably fixed exchange rate'. This indicates that the date for Stage III needs to be specified at least two and a half years in advance.

Making clear at the outset that the banking sector will have to convert on E-day should encourage a number of other organisations to do the same and hence minimise the changeover period. Conversion of all aspects of banking activity will probably necessitate branches being closed for around a week. In determining the exact date for E-day consideration should therefore be given to the volume of transactions processed by banks, both within the year and within the month.

Minting of Ecu coins will take a considerable time. Their denominations, weights, etc need to specified early. Although a shorter timescale is involved in printing new banknotes the sheer scale of the exercise again points to early specification so that the process can begin.

Supplying cash handling organisation with the new currency in advance of it becoming legal tender will help smooth both E-day and the changeover period.

Dual pricing and a publicity campaign aimed at informing the general public of the new currency and conversion rates will be required immediately before E-day. In addition, conversion tables showing how rounding should occur will be necessary. None of these can be put in place until conversion rates are known. Since exact re-referencing on the old currency will be very difficult the aim should be to help the public to come to terms with the new Ecu values. Six months is probably a sufficient time period for this and fits in with the other factors which need to be considered.

There was a positive attitude to the introduction of the Ecu by almost all of the businessmen surveyed, with only one respondent indicating a desire to retain individual national currencies. Nevertheless, most indicated that they could see few benefits from using the Ecu in the transition unless all other organisations followed suit. This suggests that promoting widespread use of the Ecu in the transitional period as a means of ensuring a positive attitude to it becoming the single currency is unnecessary, and indeed may detract from the ultimate objective, that changeover goes smoothly. In the transition, a more fruitful approach may therefore be to inform and advise on what will be necessary for conversion.

This report makes clear that software vendors and computer consultants will be at the forefront of the conversion process. It is possible that resources in this area will be stretched if all companies within the EC choose to act exactly three years in advance of E-day. This suggests that they should be encouraged to consider a longer time horizon, but clearly this would involve the date for E-day being set even sooner.

The move to the Ecu is a much larger scale conversion exercise than has ever been contemplated before. We have set out above some detailed recommendations for a smooth changeover. In addition, we would suggest that a committee be set up charged with overseeing all aspects of the Ecu's introduction. This should be set up now, and its initial tasks should be to set the date for E-day and determine the denomination etc. of the new currency.

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APPENDIX I

Decimal Conversion Tables

Exact Conversion Rates

1d	=	5/12p
3d	=	1 1/4p
6d	=	2 1/2p
1s	=	5p
2s	=	10p
1/2p	=	1.2d
1p	=	2.4d
2p	=	4.8d
5p	=	1s
10p	=	2s
50p	=	10s

I w Halfpenny Table

1d		1/2p
2d		1p
3d		1p
4d		1 1/2p
5d		2p
6d	=	2 1/2p
7d		3p
8d		3 1/2p
9d		4p
10d		4p
11d		4 1/2p
1s	=	5p

Whole New Penny Conversion Table

1d		-
2d		1p
3d		1p
4d		2p
5d		2p
6d		3p
7d		3p
8d		3p
9d		4p
10d		4p
11d		5p
1s	=	5p
1s1d		5p
1s2d		5p
1s3d		6p
1s4d		6p
1s5d		7p
1s6d		7p
1s7d		7p
1s8d		8p
1s9d		8p
1s10d		9p
1s11d		9p
2s	=	10p

APPENDIX II

Questionnaires

Industrial and Commercial Companies

COMPANY NAME:

I BACKGROUND INFORMATION

1) Which of the following do you consider your major area of operation?

Energy/water supply.
Mineral/chemical manufacturing.
Metal article manufacturing, engineering, vehicle manufacturing.
Other manufacturing.
Construction.
Distribution.
Provision of transport/communication services.
Provision of other services.

(please tick)

2) Which international currencies are normally used in this area for,

input sourcing of raw materials, components and services?
sales and invoicing?

(please indicate currency)

3) Could you give a rough idea of your international trade?

Imports in value terms and as a percentage of total costs.
Exports in value terms and as a percentage of total sales.

(please indicate £ and % figures)

If your answer to (3) is non-zero please answer questions (4) and (5).

4) Approximately how much of this trade is with other members of the E.E.C.?

Percentage of total imports.
Percentage of total exports.

(please indicate %)

5) Does operating in more than one currency impose a cost upon your organisation? If so how large as a percentage of total costs?

(please indicate Y/N and if appropriate the %)

II A SINGLE EUROPEAN CURRENCY

1) At present does your organisation use the European currency unit (ecu) in any areas of operation? If yes, please specify.

(please indicate Y/N and if appropriate give details)

2) Does your organisation have plans to use the ecu in the future? If yes, please specify.

(please indicate Y/N and if appropriate give details)

3) Would the adoption of a single currency throughout the European Community result in,

your organisation being in a better position to compete in the European market?

lead to lower internal operating costs?

(please indicate Y/N and if appropriate give details)

4) Which areas within your organisation would need to be changed to allow the ecu to be used as your sole currency of operation throughout the European Community? Some examples of what might be required are given below. Please indicate whether change would be required, the timescale involved and the likely costs.

	Change required (Y/N)	Time needed to plan change	Time needed to make change	Approx. cost (£)
Ecu price lists throughout Europe.	.....	.....	.....	.....
All negotiations on contracts in ecu.	.....	.....	.....	.....
All products and services billed in ecu.	.....	.....	.....	.....
All capital contributions and loans raised in ecu.	.....	.....	.....	.....
Payments to all suppliers/ contractors in ecu.	.....	.....	.....	.....
All accounting and book-keeping in ecu.	.....	.....	.....	.....
Presentation of accounts and balance sheets in ecu.	.....	.....	.....	.....
All employees paid in ecu.	.....	.....	.....	.....
All employees trained to use the ecu.	.....	.....	.....	.....
All internal trade in ecu.	.....	.....	.....	.....
Other, please specify.				

(please indicate the time needed to draw up the necessary plans, the time needed to implement them, and if possible the costs that would be involved in each case)

If any of these areas involve changes to computer based systems please could you also answer question (1) in section III.

5) Is there any sequencing involved in this timetable? For example, (a) could not be done before (b) had been fully planned and implemented?

(please indicate Y/N and if appropriate give details)

6) If the requirements for action which you specified above were not met until well beyond the start of your timetable would this impose additional costs upon your organisation? If so, how large as a percentage of the total costs of the changeover would this be?

(please indicate Y/N and if appropriate the %)

7) Given your answers to (4) above please indicate whether any of the changes highlighted would lead to either lower costs or the possibility of increased sales, in each case giving a rough idea of the percentage of total costs or sales involved.

(please give details)

III COMPUTER SYSTEM CHANGES

1) In section II you identified the areas within your organisation which would need to be changed to allow the ecu to be used as your sole currency of operation throughout the European Community? Where these changes involve computer based systems could you also please indicate the number of separate custom built systems involved and the number of files which would require distinct conversion.

	Number of custom built systems	Number of files needing conversion
Ecu price lists throughout Europe.	.....	.....
All negotiations on contracts in ecu.	.....	.....
All products and services billed in ecu.	.....	.....
All capital contributions and loans raised in ecu.	.....	.....
Payments to all suppliers/ contractors in ecu.	.....	.....
All accounting and book-keeping in ecu.	.....	.....
Presentation of accounts and balance sheets in ecu.	.....	.....
All employees paid in ecu.	.....	.....
All employees trained to use the ecu.	.....	.....
All internal trade in ecu.	.....	.....
Other, please specify.		

(please indicate the number of separate custom built systems involved and the number of files which would require distinct conversion)

Banks

COMPANY NAME:

I BACKGROUND INFORMATION

1) Approximately how many customer accounts do you administer?

.....

(please indicate approximate number)

2) Could you give an idea of the scale of your money transmission operation, in terms of number of items and value.

.....

.....

(please indicate number of items and value per day, month or year)

3) Roughly what proportion of your revenue is generated by foreign exchange transactions?

.....

(please indicate %)

4) How much of this business is in E.E.C. currencies?

.....

(please indicate % of total foreign exchange business)

5) Do you consider dealing in E.E.C. currencies to be a profitable area of business?

.....

(please indicate Y/N)

II A SINGLE EUROPEAN CURRENCY

1) Does the European currency unit (ecu) figure in any of the following areas of your operations?

	(Y/N)	Details
Money transmission	.....	.....
Deposit taking	.....	.....
Supply of finance	.....	.....

(please indicate Y/N and if appropriate give details)

2) Would the adoption of a single currency throughout the European Community result in,

	(Y/N)	Details
a significant loss of revenue?	.....	.....
your organisation being in a better position to compete in the European market?	.....	.....

(please indicate Y/N and if appropriate give details)

3) Which elements of your organisation's activities would need to be changed to allow the ecu to be used as the sole currency of operation throughout the European Community? Some examples of what might be required are given below.

	Change required (Y/N)	Time needed to plan change	Time needed to make change	Approx. cost (£)
Basic customer account holding information system.	.....	.....	.....	.....
Cheque sorting and recording (debits and credits).	.....	.....	.....	.....
Recording of standing orders (debits and credits).	.....	.....	.....	.....
Recording of direct debits (debits and credits).	.....	.....	.....	.....
Recording of cash dispenser transactions.	.....	.....	.....	.....
Setting of cash dispenser limits.	.....	.....	.....	.....
Provision of statements to customers.	.....	.....	.....	.....
Provision of cheques books to customers.	.....	.....	.....	.....
Provision of cheque guarantee cards to customers.	.....	.....	.....	.....
Cash dispenser machines.	.....	.....	.....	.....
Automated tills.	.....	.....	.....	.....
Registration of shares.	.....	.....	.....	.....
Presentation of accounts and balance sheets in ecu.	.....	.....	.....	.....
All employees paid in ecu.	.....	.....	.....	.....
Other, please specify.				

(please indicate the time needed to draw up the necessary plans, the time needed to implement them, and if possible the costs that would be involved in each case)

If any of these areas involve changes to computer based systems please could you also answer question (1) in section III.

4) Is there any sequencing involved in this timetable? For example, (a) could not be done before (b) had been fully planned and implemented?

.....

.....

.....

.....

.....

.....

.....

.....

(please indicate Y/N and if appropriate give details)

5) If the requirements for action which you specified above were not met until well beyond the start of your timetable would this impose additional costs upon your organisation? If so, how large as a percentage of the total costs of the changeover would this be?

.....

.....

(please indicate Y/N and if appropriate the %)

III COMPUTER SYSTEM CHANGES

1) In section II you identified the activities within your organisation which would need to be changed to allow the ecu to be used as the sole currency of operation throughout the European Community? Where these changes involve computer based systems could you also please indicate the number of separate custom built systems involved and the number of files requiring conversion.

	Number of custom built systems	Number of files needing conversion
Basic customer account holding information system.	.....	.....
Cheque sorting and recording (debits and credits).	.....	.....
Recording of standing orders (debits and credits).	.....	.....
Recording of direct debits (debits and credits).	.....	.....
Recording of cash dispenser transactions.	.....	.....
Setting of cash dispenser limits.	.....	.....
Provision of statements to customers.	.....	.....
Provision of cheques books to customers.	.....	.....
Provision of cheque guarantee cards to customers.	.....	.....
Cash dispenser machines.	.....	.....
Automated tills.	.....	.....
Registration of shares.	.....	.....
Presentation of accounts and balance sheets in ecu.	.....	.....
All employees paid in ecu.	.....	.....
Other, please specify.		

(please indicate the number of separate custom built systems involved and the number of files which would require distinct conversion)

Other Organisations

COMPANY NAME:

I BACKGROUND INFORMATION

1) Which of the following do you consider your major area of operation?

Distribution.
Provision of transport/communication services.
Banking/finance.
Provision of other services.

(please tick)

2) Is your organisation involved in any overseas transactions?

.....

.....

.....

(please indicate Y/N and if appropriate give details)

If you answered Yes to question (2) please answer questions (3) and (4).

3) Approximately what proportion of these overseas transactions is with other members of the E.E.C.?

.....

.....

.....

(please indicate % and if appropriate give details)

4) Does operating in more than one currency impose a cost upon your organisation? If so how large as a percentage of total costs?

.....

(please indicate Y/N and if appropriate the %)

II A SINGLE EUROPEAN CURRENCY

1) At present does your organisation use the European currency unit (ecu) in any areas of operation? If yes, please specify.

.....

.....

.....

.....

(please indicate Y/N and if appropriate give details)

2) Does your organisation have plans to use the ecu in the future? If yes, please specify.

.....

.....

.....

.....

(please indicate Y/N and if appropriate give details)

3) Would the adoption of a single currency throughout the European Community result in,

your organisation being in a better position to compete in the European market?

.....

.....

lead to lower internal operating costs?

.....

.....

(please indicate Y/N and if appropriate give details)

4) Which areas within your organisation would need to be changed to allow the ecu to be used as your sole currency of operation throughout the European Community? Please indicate the nature of the change required, the timescale involved and the likely costs.

Nature of the change required	Time needed to plan change	Time needed to make change	Approx. cost (£)
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

(We realise this is a very open-ended question, but any information you could give here would be very useful. If possible please indicate the time needed to draw up the necessary plans, the time needed to implement them, and the costs that would be involved in each case)

If any of these areas involve changes to computer based systems please could you also answer question (1) in section III.

5) Given your answers to (4) above please indicate whether any of the changes highlighted would lead to either lower costs or the possibility of increased revenue, in each case giving a rough idea of the percentage of total costs or revenue involved.

.....

.....

.....

.....

(please give details)

III COMPUTER SYSTEM CHANGES

1) In section II you identified the areas within your organisation which would need to be changed to allow the ecu to be used as your sole currency of operation throughout the European Community? Where these changes involve computer based systems could you also please indicate the number of separate custom built systems involved and the number of files which would require distinct conversion.

Nature of the change required	Number of custom built systems	Number of files needing conversion
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

(please indicate the number of separate custom built systems involved and the number of files which would require distinct conversion)

APPENDIX III

Manual Conversion of Custom Built Computer Systems

In an attempt to identify the scale and cost of manually converting currency data held in a modern computer system we have enlisted the help of a systems analyst. A summary of his report is given below. It assumes that outside consultants are used to make the necessary changes, although even if these changes were done in house the overall finding would be little different. In addition, it assumes that only custom built systems would require conversion, since it is normal practice for software package vendors to provide free solutions for changing data as a result of statutory changes. Finally the assumption is made that only data values would require conversion, i.e. that no changes would be necessary to existing software.

Three types of data within any custom built system would all require conversion of their currency values: a) balances, b) reference data and c) transactions data. Within the invoicing system these would equate to a) total amounts due from customers, b) prices and c) amounts for orders still being processed.

All custom built systems are different so even making these fairly simple changes to one system would still necessitate all the normal phases of system development to be carried out. Phase one would involve analysis of the problem, where the impact of conversion is assessed, all files requiring conversion are identified and all controls specified. Phase two would involve design of the computer programs and temporary data files necessary for conversion. Phase three would require these programs to be coded and tested. Phase four would then involve a system test where the developers test the conversion programs together to ensure that all data is converted correctly. Following this in phase five the users would check that all data values are converted correctly, and a rehearsal of conversion would take place. Only after phases one to five had been completed successfully would conversion actually occur. Total cost of the exercise is given by the equation below.

$$TC = R1((S1*A)+(F*D)+(F*B)+(S1*T)+(N*S1*V1))+(R2(N*S2*V2) \quad (1)$$

where;

- R1 = average daily cost rate of system developers
- R2 = average daily cost rate of system users
- S1 = number of custom built systems
- S2 = number of total systems (custom and packages)
- A = average time (days) analysis per system
- F = number of files which require distinct conversion programs
- D = average time (days) to design each conversion program
- E = average time (days) to build each conversion program
- T = average time (days) required to test each system
- N = number of rehearsals +2 (to allow for user test and conversion)
- V1 = average time (days) provided by system developers to support user testing, rehearsal, and live conversion
- V2 = average time (days) effort required by users to carry out user test, rehearsal and live conversion.

APPENDIX IV

Sampling Frame

Alcatel
AMADEUS
Argos
BAT Industries
BOC International
BPB Industries
BTR
Banque Nationale de Paris
Barclays Bank
Blackwood Hodge
Booker
British Coal
British Rail
British Telecommunications
Brown Shipley Holdings
Cazenove & Company
Commercial Union
Courtaulds
Coutts & Co
Dixons Group
Dow International
Du Pont
East Midlands Electric
Firestone
Glaxo
GMB
Hanson
Imperial Chemical Industries
ICL
Leopold Joseph & Sons
John Laing
Legal and General
John Lewis
Lister & Co
Lloyds Bank
London Forfaiting Co
Low and Bonar
Lucas Industries
McKechnie
Marks & Spencer
Mars
Midland Bank
Morgan, Grenfell & Co
Morgan Guaranty Trust Co
The National Grid Company
National Power
National Provident Institution
National Westminster Bank
Norwich Union
Ocean Group
Pallas

Pearl
The Post Office
Powergen
Prudential
Renold
Rio Tinto-Zinc
Rothmans International
NM Rothschilds & Sons
The Royal Bank of Scotland
Saint Gobain
Simon Engineering
Shell
Slough Estates
Smiths Industries
Standard Chartered Bank
Sun Alliance
TI Group
TSB Group
Tarmac
Thorn EMI
Tioxide
3i Group
Unilever
Vickers
SG Warburg & Co
H Young Holdings

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