RECENT DEVELOPMENTS IN THE IMPLEMENTATION OF MONETARY POLICY

Javier Ariztegui
José Pérez

Banco de España. Servicio de Estudios
Documento de Trabajo n.º 8411

This paper is an english version of an article published in the *Boletin Económico*, Bank of Spain, February 1984.

ISBN: 84-505-0118-0

Depósito legal: M. 20933 - 1984

Talleres Gráficos del Banco de España

RECENT DEVELOPMENTS IN THE IMPLEMENTATION OF MONETARY POLICY

Starting from 1983, Spanish authorities have come to define their basic monetary targets in terms of growth of "private sector liquidity" (A.L.P.). Along with them, they maintain their ordinary targets of expanding M_3 as a part of a supplementary device to gather information and as a useful tool for the implementations and monitoring of monetary policy. The same as in other countries that are faced with very much alike phenomena of financial innovations, our authorities have decided that their interest should be focused on a broader aggregate that would measure the liquidity at the disposal of households and non-banking firms. To improve the controllability of this aggregate they have introduced new regulations for cash requirements, extending the institutions and liabilities subject to the legal coeficients. And, once that the new cash ratio has come into force, there has been a change as to the steps to be taken to measure the instrumental variable, that serves as a guideline for them to govern their day-to-day operations in the money markets.

The reason why this change has come about have already been discussed previously (*). They are to be found in the dynamics of financial developments that have perturbed the relationships upon which the system of control is based.

(*) See Annual Report 1982, page 196 et sequitur.

In this way, the public have at their disposal some attractive-yielding, high-liquidity assets that make of them very close substitutes for bank deposits.

In this paper, we shall try to give a brief account of the changes and reasons why their introduction has seemed advisable.

The intermediate variable

In Spain, the policy of monetary control is articulated in two levels. At the first level, the authorities aim at achieving some specified ultimate goals (which are basically defined in terms of the rate of nominal expenditure) through the regulation of a variable that appears as an intermediate target. Taking a step further, the authorities make every effort to attain such targets by means of controlling an operative or instrumental variable. This articulation at two consecutive stages, that would seem superfluous at first sight, would be justified, however, by lags in the process of gathering information and of influencing upon the evolution of the variables that measure the ultimate goals which are being sought for. So that, if the authorities were to dispense with the intermediate stage and sought to establish an inmediate relationship between the rates of the economic activity and their operations in the money markets, they will be actually making a comparison between two series of fragmentary data at a distance from each other of no less than a four-month period.

This real fact has made it advisable to select a "substitute" for the nominal levels of production and expenditure, i.e., the quantity of money or of liquidity at the disposal of the economy whose information is processed simultaneously with, or within brief time-lags, the decisions to intervene in the markets. Besides, this variable serves as a means of witnessing and comparing how loan and deposit institutions are assimilating and transferring to their customers the signs set forth by the authorities in their operations of control. Therefore, if it is to be of use in the role assigned to it, the intermediate goal selected shall have to be a true reflection, in the first instance, of the evolution of the nominal levels of activity, as a result of the relationships of causality and of the statistical regularities with which both variables are tied together. Secondly, such variable must be liable to be controlled and, lastly, it should allow for obtaining a correct information about its development within a short span of time.

From 1973 onwards, the variable selected has been a broad monetary aggregate: M_3, and the authorities have set out to attain a series of growth rates in terms of quantities for each six-month period or for a calendar year. The merits of this aggregate were self-evident for it showed a close, very steady relationship with the levels of expenditure and nominal income of the Spanish economy. Besides, its evolution could be controlled within quite satisfactory margins and the information available was obtained in a prompt and realiable manner.

About the middle of the 70's, while inflationary expectations became stronger and were revised to upward levels, and the rates of interest of interest-bearing deposits continued to be regulated under the decision of the authorities, there were other more strict monetary aggregates --M_1 and, to a lesser degree, M_2-- which could also offer appropiate information about how expenditure and prices were developing. Yet at the end of the decade, when a gradual deregulation of the financial system was under way and the administrative restrictions to freeze time deposits and to fix their interest rates began to being left aside systematically; when there was a crisis in the securities market as an alternative to deposits and when households and enterprises became finally conscious of the costs of opportunity of full liquidity, then there was a reflux to banks' time deposits. Subsequently, at the beginning of the 80's, a process of generation of quasi-deposits set itself in motion. This was stimulated by pressures exerted over the financial markets owing to the increasing public sector borrowing requirements and to costs and distortions brought about by the existing financial and fiscal administrative regulations. These developments, which began by subtracting from the more stringent aggregates some capacity of information, brought about in the end intense disturbances as regards the demand for M_3 while, at the same time, a remarkable stability in the demand for a larger aggregate, i.e., the liquid assets held by the public (A.L.P.) could be easily noticed. Thus the basis was laid for the authorities to revise gradually their former choice.

The first move was from a system where there has been a centralization, almost exclusively, around an intermediate target, i.e., M_3 towards another scheme whose implementation was based on two intermediate targets: M_3 and A.L.P.

The empirical evidence available until the end of 1982 showed that the stability of the existing relationship among the growth of M_3, the pace of real expenditure, and the rate of inflation, was above the stability noticed as regards other monetary and liquidity aggregates. Yet the most recent experience and the projections of development in the money markets would suggest --with a fair degree of probability-- that some future displacements of such relationship may occur. Under these circumstances, because of reasons for caution and pragmatism that were necessary at the moment, it was felt that it would be advisable a course of action consisting in correcting the targets of growth for M_3 as soon as a reliable information about these displacements were available.

Econometric studies conducted until then pointed out that a far-reaching aggregate of liquidity --liquid assets held by non-banking firms and households-- could maintain a fairly stable relationship with real expenditure and prices, though somewhat lesser than the one of M_3. On the other hand, and as it can be seen from the table annexed where a break-up of the different components of M_3 and A.L.P. is shown, the far-reaching nature of the latter would immediately suggest that its behaviour would be more stable

when faced with displacements in the portfolios which may trouble the evolution of M_3 because such displacements are compensated for in the statistical definitions under which the overall positions of liquidity of the public are gathered. Therefore, it stood to reason to feel hopeful that, to the extent where the processes of generation of some assets other than M_3 were accelerated, the equation of demand of A.L.P. and, in conclusion, the relationship between this aggregate and nominal expenditure would be finally more stable. All this would call for a definition of the targets of growth for A.L.P. so that from the growth of both variables --M_3 and A.L.P.-- some information about the above mentioned displacement could be obtained. The choice of a scheme of implementation based upon two intermediate goals had been finally reinforced by the shortcomings and lags in the statistical information available as regards A.L.P. and because the authorities had less ability to control its evolution. Thus, even when for longer periods of time it would seem advisable to set out targets for A.L.P., in the shorter run, at the time of fixing the paths of instrumental reference and of evaluating the immediate evolution of the credit-granting system, the task of following the evolution of M_3 became unavoidable. This had to be done, however, by paying a closer attention to the evolution of the interest rates and to those parts of the system which, as it happens with the exchange markets, could provide information upon an excess (or a lack) in the liquidity held by the public.

The accumulated experience gained all along 1983 was showing that this scheme of action was capable, in the last

instance, of assuring in a fairly reliable way, the necessary discipline to achieve a reduction in the domestic and external imbalances of our economy. Such scheme, however, would entail a series of shortcomings and was generating a number of distortions in the monetary and financial markets that would call for a change of strategy supported by some timely reforms introduced in the mechanics of the control.

An intensification in the displacements of the portfolios held by the public made more evident the problems concerning the information and control of liquid assets. The lag in the availability of figures for A.L.P. (*) made it more difficult a proper assessment of the monetary evolution, a task that became more problematic when the expectations held by the public were very sensitive as regards the inflation and the rate of exchange. The control of this aggregate became less accurate as long as these displacements were sharper and this fact introduced a certain degree of instrumental instability and made the evolution of the monetary markets more volatile.

The fact that the liabilities computed in the basis of assessment of required ratios --cash ratio,

---

(*) Within the former scheme of information and control, blocks of figures for M_3 in a ten-day period were available with a time-lag of ten days. Definitive data for "other liquid assets" referred to the last day of each month were obtained with a lag of a month or a month and a half afterwards, although for some items an advance could be obtained with a time-lag of fifteen to twenty days.

interest- bearing compulsory deposits and investment ratio-- were confined exclusively to banks' deposits implied that a certain stimulus was being given to the generation of other banks' liabilities and to the appearance of new tools and intermediaries. And, for a given remuneration of compulsory assets, such stimulus was growing along with the level of the market rates.

Thus, the multiplier of cash assets was not only less stable and less predictable for A.L.P. than for M_3 (*)

(*) The relationship between M_3 and the cash assets of the banks could be summarized as follows:

$$M_3 = m_a \, AC = \frac{1 + c}{l} \, AC$$

where: m_a is the respective multiplier
AC are the banking system cash reserves
c is the currency-deposits ratio
l is the aggregate reserve ratio.

The relationship between A.L.P. and AC could be summarized as:

$$ALP = m_b \, AC = \frac{1 + c + h}{l} \, AC$$

where: m_b is the respective multiplier.
h is the relationship between "Other liquid assets" and banks' deposits.
ALP = M_3 + "Other liquid assets".

As it can be realized, the presence of h is what makes that m_b would be less predictable than m_a. We could infer from the above that the evolution of h is a function of the interbanking rate of interest.

but it also contained, as it has been already pointed out, some elements of feeding-back of the strains in the monetary markets which caused a certain instrumental instability and enlarged the fluctuations of the rates of interest and of the monetary aggregates. All this not only had a negative impact over the implementation of the monetary policy and on the achievement of its goals but it also entailed very serious risks as regards the performance and stability of the financial system.

Consequently, it was necessary to bring about a reform of the compulsory ratios and, more particularly, of the cash ratio, so that they could be extended to the bank's liabilities (*) as a whole and to other financial intermediaries with the view of reducing or eliminating the existing distorsions.

When the new regulations governing the required cash ratio (**) came into force as from January of this year, a noticeable improvement as regards the information concerning A.L.P. and the capacity of the authorities to control its evolution has been achieved.

(*) With the exception of their own resources.

(**) A summary, together with their respective references, can be seen in the Boletín Económico, Bank of Spain, January 1984, pages 33-35.

The capacity of controlling A.L.P. is now rather similar to the control of M_3 (*). In the first instance, we must predict the evolution of the Treasury Bills held by the public, whether definitively or temporarily tranferred. In the second, it is necessary to predict the evolution of "other banks' liabilities" exclusive of deposits, subject to cash coefficients.

(*) Taking into account the new regulations, the relationship between cash reserves, on the one hand, and M_3 and A.L.P. on the other, could be summarized as follows:

Let it be:

$$M_3 = E + D = E + PC - OPB$$

$$ALP = E + D + OPB + PT = E + PC + PT$$

where:

E is currency.
PC are the liabilities subject to reserve requirements.
D is the amount of bank deposits.
OPB are the other banks' liabilities subject to reserve requirements.
PT are the Treasury Bills held by the public, whether definitively or temporarily transferred.

Once that the following ratios have been defined:

$$c' = \frac{E}{PC} \quad ; \quad i = \frac{OPB}{PC} \quad ; \quad j = \frac{PT}{PC} \quad ; \quad l' = \frac{AC}{PC} \quad ;$$

we obtain

$$M_3 = \frac{l + c' - i}{l'} AC, \text{ and}$$

$$ALP = \frac{l + c' + j}{l'} AC.$$

Lastly, we still have some comments upon the good quality and the quickness of the information received about both aggregates. Immediately after the reform introduced in the cash ratio, the monetary authorities collect the evolution of the majority of the components of A.L.P. with a time-lag of five working days, as long as declarations of the basis of assessment of this ratio are being processed. Likewise, the first steps to start a process for the collection of information are now being taken, with a time-lag of ten calendar days with respect to the end of the month. Such process deals with the growth of other liquid assets held by non-banking firms and households not included in the liabilities computed to assess the cash ratio, as it is the case with Treasury Bills bought by the public, or with repurchase agreement involving public assets. If we may rely on these sources, the good quality of the information obtained as regards these two variables is very much alike, although, in the case of M_3 and the other banks' liabilities computed to assess the cash ratio, the frequency and rapidity are decidedly better.

To sum up, the improvement in the statistical information and in the capacity of control implicit in the new regulations governing the reserve requirements of credit-granting institutions that have come into effect at the beginning of 1984 has added up to a greater stability shown by the demand for liquid assets held by non-banking firms and households during the most recent period.

This mix of related reasons is what justifies the fact that the liquid assets held by non-banking and

households have now come to occupy a crucial place in the implementation of the monetary policy. On the other hand, M_3 is also performing the role of an intermediate target owing to the quickness and good quality of the information obtained from them. Such role will be useful, together with the information available about the evolution of the rest of other liabilities computed to assess the cash ratio, to evaluate the inertia and the reactions underlying in the processes of growth of the credit-granting system within a short time-horizon, say, at less than a month. For longer periods, the targets defined in terms of growth of A.L.P. will have a tendency to prevail over, so that the targets of expansion for M_3 will be conditionals to the previsions advanced with respect to the rest of liquid assets.

Nonetheless, the Bank of Spain will continue to pay attention to the evolution of both aggrégates and shall endeavour to make a judgement about the informacion supplied by the behaviour of their differente components. Such attention will be extended to the rest of the monetary and credit aggregates and also to those financial variables that contain information as regards the evolution of the ultimate goals pursued by the authorities. All this is all the more necessary in a world of changing relationships and where financial developments have attained a great fluidity.

Evolution of the path of cash assets

As it has been already discussed, the selection of A.L.P. as an intermediate variable and the enlargement of the

liabilities subject to reserve requirements have determined a bundle of finishing touches in the process of knowing quantitatively the instrumental path of cash reserves. Nevertheless, the changes introduced at this level do not have an influence upon the selection of the operative variable --banking system cash reserves (*)-- nor upon its temporary modulation, this latter being dependent on the short-term evolution of interest rates and exchange markets, but upon a procedure of computation that allows us to pass from targeted path for A.L.P. to the nearest stage closer to the Bank of Spain operations in the inter-banking markets.

Once that the authorities, within the framework of annual rates of growth for A.L.P., have fixed a concrete guideline which becomes a landmark for the implementation of the control for a short period of time --a quarter, for example-- the Bank of Spain proceeds to find out the path of growth of the seasonally-adjusted series of A.L.P. which will determine its action for the next month. As from this moment, a forecast as regards the growth of Treasury Bills held by the public will be elaborated taking into accunt the evolucion in the pace of fortnightly bids; the differentials observed between the rates of interest of

---

(*) The selection of this variable has been reinforced by the new regulations about the lagged computation of the cash in the banks' vaults (see Circular 1/1984 from de Bank of Spain to private banks and savings banks). In this way, errors in the prediction of this component are thus avoided. Such errors were affecting the capacity of the authorities to control short-term evolution of cash reserves. This fact has added up to the improved predictability of the multiplier.

banks' liabilities and the rates of interest of Treasury Bills; and the situation in the monetary markets. Also, tendency elements within the foreseeable evolution of currency are evaluated. Thus, we are trying to draw out the permanent elements so that the expansion of the banking system will not be affected by transitory movements of legal tender hoardings. Likewise, we are making an estimate as regards the evolution of sight deposits of individuals with the Bank of Spain and of the mortgage securities issued by special credit institutions. These are components whose variation and importance within the ensemble of A.L.P. are much lesser.

As soon as these four components have been calculated and put aside from the rest of A.L.P. to the extent that the schedules of fulfilment of new assets included in the cash ratio will be effective, a bundle of forecasts will be then incorporated. Such predictions deal with the outstanding balances for operations carried out before the new cash ratio came into force which are not include temporarily in the basis of computation (*) and which are shown apart from the values of reference for A.L.P.

(*) At this moment things are going on this way as regards: short-term bank' bonds whose appearance in the market was approved before 31st December 1983; mortgage securities whose descriptive booklets were approved before 25th October of the same year; liabilities arising out of insurance operations, and endorsed bills and promissory notes of companies, guaranteed in the financial years before 1984.

In the same manner, until the new cash ratio for cooperatives comes into effect, an estimate about the progress of their liabilities is elaborated through its segregation from the residual ensemble.

Once that all these operations are carried out, we still have the aggregate of eligible assets of the banking system --deposits' balances and operations which are now included in the basis of the ratio-- for which the Bank of Spain is required to supply cash assets with a view of regulating their rate of growth. To obtain the amount of these assets, the value of the required ratio --18%-- will be applied to the above referred remainder, to which a prediction of the excess reserves ratio that the system tends to maintain as an average will be incorporated. In this instance, erratic or transitory components are also taken away. As soon as this magnitude is estimated, the cash existing in the banks' vaults the previous month is excluded from the block of cash assets. The resulting values for deposits with the Bank of Spain, considered in terms of ten-day averages of the original series, will serve as a guideline for the Bank of Spain daily operations in the money markets.

At it has been already realized, until the schedules of adaptation to the new regulations about the reserve requirements come to an end, this process is characterized by a greater complexity. Once that such period will be finished, the method of elaboration shows a remarkable resemblance with the one previously used, with the exception that at the

present moment it is necessary to evaluate the acquisition by the non-banking firms and households sector of Treasury Bills, both definitively and with a repurchase agreement.

A few final remarks about the changes when measuring liquid assets at the disposal of the public.

As it can be seen from Table 1, the integration of cooperative credit associations for accounting purposes within the banking system has been accompanied by a new definition of the monetary and liquidity aggregates. Sight, savings and time deposits of the public with cooperative credit associations are thus included in the measurement of M_3.

There have also been some revisions in the definition of A.L.P. In the first instance, owing to the fact that the cooperative credit associations have been included into the credit-granting system, and to the consolidation of the societies acting as intermediaries in the money market within such system at the time of measuring credit and liquidity aggregates. Secondly, some additional items of quasi-deposits have also been included, as it is the case with temporary transfers (with repurchase agreement) of assets to the public from credit-granting institutions and from societies acting as intermediaries in the money market, and with insurance and capitalization operations carried out by savings banks. Lastly, the information available about deposits of Public Administrations with private banks have

allowed for them to be excluded from M_3 and A.L.P. where they were appearing until now in a spurious manner. It should be understood by the term "public" the ensemble of resident individuals and companies other than Public Administrations, credit-granting institutions and societies acting as intermediaries in the money market.

Whenever the source of information would be the statements about the cash ratio, the monthly figures will come out as daily average balances and in the case when the sources are the monthly balance-sheets, the monthly average balance could be obtained as a semi-sum of the corresponding figures between the previous end of the month and the current month-end.

TABLE 1

Liquid assets held by the public (1)

Assets \ Issuers	Credit-granting institutions					S.M.M.D. (societies acting as intermediaries in the money market)	Treasury
	Bank of Spain	Private banks	Savings banks	Cooperative credit associations	Special credit institutions		
Currency (2)	*						
Deposits (sight, savings and time) (3)	*	**	**	**			
Liabilities from insurance operations			**				
Short-term banks Bonds		**	**				
Mortgage securities		**	**	**	*		
Banker acceptances		**	**	**			
Guaranteed commercial paper		**	**	**			
Repurchase operations with private assets		**	**	**		**	
Repurchase operations with public assets	*	*	*	*		*	
Certificates of Monetary Regulation	*						
Treasury Bills							*

(*) Item included among liquidity and monetary aggregates. Components of M_3 are enclosed within the thicker line.

(**) Items included among the definition of monetary and liquidity aggregates which are al present eligible liabilities of the required cash ratio.

(1) By the term "public" it is generally understood those resident individuals or companies, which are not included among Public Administrations, credit-granting institutions or societies acting as intermediaries in the money market.

(2) For statistical purposes, the circulation of coins issued by the Treasury is treated as if this function were performed by the bank of Spain.

(3) Certificates of deposits and promisory notes issued by banking institutions are included among time deposits.

DOCUMENTOS DE TRABAJO:

7801 **Vicente Poveda y Ricardo Sanz**: Análisis de regresión: algunas consideraciones útiles para el trabajo empírico (*).

7802 **Julio Rodríguez López**: El PIB trimestral de España, 1958-1975. Avance de cifras y comentarios (*). (Publicadas nuevas versiones en Documentos de Trabajo núms. 8211 y 8301).

7803 **Antoni Espasa**: El paro registrado no agrícola 1964-1976: un ejercicio de análisis estadístico univariante de series económicas (*). (Publicado en Estudios Económicos n.º 15).

7804 **Pedro Martínez Méndez y Raimundo Poveda Anadón**: Propuestas para una reforma del sistema financiero.

7805 **Gonzalo Gil**: Política monetaria y sistema financiero. Respuestas al cuestionario de la CEE sobre el sistema financiero español (*). Reeditado con el número 8001.

7806 **Ricardo Sanz**: Modelización del índice de producción industrial y su relación con el consumo de energía eléctrica.

7807 **Luis Angel Rojo y Gonzalo Gil**: España y la CEE. Aspectos monetarios y financieros (*).

7901 **Antoni Espasa**: Modelos ARIMA univariantes, con análisis de intervención para las series de agregados monetarios (saldos medios mensuales) M_3 y M_2.

7902 **Ricardo Sanz**: Comportamiento del público ante el efectivo (*).

7903 **Nicolás Sánchez-Albornoz**: Los precios del vino en España, 1861-1890. Volumen I: Crítica de la fuente.

7904 **Nicolás Sánchez-Albornoz**: Los precios del vino en España, 1861-1890. Volumen II: Series provinciales.

7905 **Antoni Espasa**: Un modelo diario para la serie de depósitos en la Banca: primeros resultados y estimación de los efectos de las huelgas de febrero de 1979.

7906 **Agustín Maravall**: Sobre la identificación de series temporales multivariantes.

7907 **Pedro Martínez Méndez**: Los tipos de interés del Mercado Interbancario.

7908 **Traducción de E. Giménez-Arnau**: Board of Governors of the Federal Reserve System-Regulations AA–D–K–L–N–O–Q (*).

7909 **Agustín Maravall**: Effects of alternative seasonal adjustment procedures on monetary policy.

8001 **Gonzalo Gil**: Política monetaria y sistema financiero. Respuestas al cuestionario de la CEE sobre el sistema financiero español (*).

8002 **Traducción de E. Giménez-Arnau**: Empresas propietarias del Banco. Bank Holding Company Act-Regulation «Y» (*).

8003 **David A. Pierce, Darrel W. Parke, and William P. Cleveland, Federal Reserve Board and Agustín Maravall, Bank of Spain**: Uncertainty in the monetary aggregates: Sources, measurement and policy effects.

8004 **Gonzalo Gil**: Sistema financiero español (*). (Publicada una versión actualizada en Estudios Económicos n.º 29).

8005 **Pedro Martínez Méndez**: Monetary control by control of the monetary base: The Spanish experience (la versión al español se ha publicado como Estudio Económico n.º 20).

8101 **Agustín Maravall, Bank of Spain and David A. Pierce, Federal Reserve Board**: Errors in preliminary money stock data and monetary aggregate targeting.

8102 **Antoni Espasa**: La estimación de los componentes tendencial y cíclico de los indicadores económicos.

8103 **Agustín Maravall**: Factores estacionales de los componentes de M_3. Proyecciones para 1981 y revisiones, 1977-1980.

8104 **Servicio de Estudios**: Normas relativas a las operaciones bancarias internacionales en España.

8105 **Antoni Espasa**: Comentarios a la modelización univariante de un conjunto de series de la economía española.

8201 **Antoni Espasa**: El comportamiento de series económicas: Movimientos atípicos y relaciones a corto y largo plazo.

8202 **Pedro Martínez Méndez e Ignacio Garrido**: Rendimientos y costes financieros en el Mercado Bursátil de Letras.
8203 **José Manuel Olarra y Pedro Martínez Méndez**: La Deuda Pública y la Ley General Presupuestaria.
8204 **Agustín Maravall**: On the political economy of seasonal adjustment and the use of univariate time-series methods.
8205 **Agustín Maravall**: An application of nonlinear time series forecasting.
8206 **Ricardo Sanz**: Evaluación del impacto inflacionista de las alzas salariales sobre la economía española en base a las tablas input-output.
8207 **Ricardo Sanz y Julio Segura**: Requerimientos energéticos y efectos del alza del precio del petróleo en la economía española.
8208 **Ricardo Sanz**: Elasticidades de los precios españoles ante alzas de diferentes inputs.
8209 **Juan José Dolado**: Equivalencia de los tests del multiplicador de Lagrange y F de exclusión de parámetros en el caso de contrastación de perturbaciones heterocedásticas.
8210 **Ricardo Sanz**: Desagregación temporal de series económicas (*).
8211 **Julio Rodríguez y Ricardo Sanz**: Trimestralización del producto interior bruto por ramas de actividad. (Véase Documento de Trabajo n.º 8301).
8212 **Servicio de Estudios. Estadística**: Mercado de valores: Administraciones Públicas. Series históricas (1962-1981).
8213 **Antoni Espasa**: Una estimación de los cambios en la tendencia del PIB no agrícola, 1964-1981.
8214 **Antoni Espasa**: Problemas y enfoques en la predicción de los tipos de interés.
8215 **Juan José Dolado**: Modelización de la demanda de efectivo en España (1967-1980).
8216 **Juan José Dolado**: Contrastación de hipótesis no anidadas en el caso de la demanda de dinero en España.
8301 **Ricardo Sanz**: Trimestralización del PIB por ramas de actividad series revisadas
8302 **Cuestionario OCDE. Servicio de Estudios. Estadística**. Cuadro de flujos financieros de la economía española (1971-1981) (*).
8303 **José María Bonilla Herrera y Juan José Camio de Allo**: El comercio mundial y el comercio exterior de España en el período 1970-1981: Algunos rasgos básicos.
8304 **Eloísa Ortega**: Indice de precios al consumo e índice de precios percibidos.
8305 **Servicio de Estudios. Estadística**: Mercado de Valores: Instituciones financieras. Renta fija. Series históricas (1962-1982).
8306 **Antoni Espasa**: Deterministic and stochastic seasonality: an univariate study of the Spanish Industrial Production Index.
8307 **Agustín Maravall**: Identificación de modelos dinámicos con errores en las variables.
8308 **Agustín Maravall, Bank of Spain and David A. Pierce, Federal Reserve Board**: The transmission of data noise into policy noise in monetary control.
8309 **Agustín Maravall**: Depresión, euforia y el tratamiento de series maníaco-depresivas: el caso de las exportaciones españolas.
8310 **Antoni Espasa**: An econometric study of a monthly indicator of economic activity.
8311 **Juan José Dolado**: Neutralidad monetaria y expectativas racionales: Alguna evidencia en el caso de España.
8312 **Ricardo Sanz**: Análisis cíclicos. Aplicación al ciclo industrial español.
8313 **Ricardo Sanz**: Temporal disaggregation methods of economic time series.
8314 **Ramón Galián Jiménez**: La función de autocorrelación extendida: Su utilización en la construcción de modelos para series temporales económicas.
8401 **Antoni Espasa y María Luisa Rojo**: La descomposición del indicador mensual de cartera de pedidos en función de sus variantes explicativas.
8402 **Antoni Espasa**: A quantitative study of the rate of change in Spanish employment.
8403 **Servicio de Producción y Demanda Interna**: Trimestralización del PIB por ramas de actividad, 1975-1982.
8404 **Agustín Maravall**: Notas sobre la extracción de una señal en un modelo ARIMA.
8405 **Agustín Maravall**: Análisis de las series de comercio exterior —I—.
8406 **Ignacio Mauleón**: Aproximaciones a la distribución finita de criterios Ji- cuadrado: una nota introductoria.

8407 **Agustín Maravall**: Model-based treatment of a manic-depressive series.
8408 **Agustín Maravall**: On issues involved with the seasonal adjustment of time series.
8409 **Agustín Maravall**: Análisis de las series de comercio exterior —II—.
8410 **Antoni Espasa**: El ajuste estacional en series económicas.
8411 **Javier Ariztegui y José Pérez**: Recent developments in the implementation of monetary policy.

* *Las publicaciones señaladas con un asterisco se encuentran agotadas.*

Información: Banco de España, Servicio de Publicaciones. Alcalá, 50. Madrid-14.