

Berichte

The Demand for Money in Thirteen European and Non-European Countries: A Tabular Survey

The first statistical studies on money demand were carried out at the end of the thirties by *Brown* [1938, 1939]. Since that time there have been so many empirical investigations in this field that it is hardly possible for anyone to have a complete overview. The investigations differ considerably both in theoretical specification and empirical results. Most studies emphasize the demand for money rather than the supply. The supply then is assumed to be exogenous, that is independent of the explanatory variables in the demand function. Money demand studies also differ significantly in their choice of dependent and independent variables. These differences are partly explained by the fact that authors adhere to different theories on the demand for money. The evolution of thought on this issue has been pointed out by a number of authors (see e. g. *Gilbert* [1953], *Laidler* [1969], *Teigen* [1970] and *Humphrey* [1973]). However, empirical evidence on the subject is still growing. Therefore, it may be interesting to look at a sample of reported results for different countries reported in the literature.

The table below summarizes the most important studies carried out for ten European countries, Australia, Canada and Japan. Excluded are the important contributions for the United States and the developing countries¹. Furthermore we confined ourselves to time series analyses of the demand for money, based on quarterly data. The table lists the most important features of the reported studies.

¹ For the developing countries the reader is referred to e. g. *Adekunle* [1968], *Silveira* [1973] or *Banerjee* [1973]. Interesting summaries, particularly of studies for the United States, are given by *Frazer* [1967], *Goodhart* [1970], *Laidler* [1969], *Nieuwenburg* [1969] and *Walters* [1970]. Very interesting, not least because of its methodology, is the summary by *Feige & Pearce* [1972] and the study of *Goldfeld* [1973].

It appears that, on the whole, two definitions are used to characterize the money variables: broad money and narrow money. *Cotula* for Italy, *Crouch* for England and *Mattfeld* for Western Germany disaggregate into components, like notes and coin, demand deposits and time deposits. *Price* and also *Hacche* in their analyses for England allow for different money holders. It is interesting to note that *Teigen* in his study of Norway extends the definition of money to include unutilized credit lines². At particular details, however, money definitions differ from country to country. In some studies the money stock — and the other explanatory variables — are taken in constant prices. In nearly all studies income is represented either by gross national product (GNP) or by gross domestic product (GDP). Only a few studies use other aggregates, like gross national expenditure (GNE). It should be kept in mind, however, that if one postulates a logarithmic linear relationship between real money balances and real income, this assumption implies that the price elasticity of the demand for nominal money is assumed to be equal to unity. Only *Price* for the United Kingdom, *Grandmont* for France and *Fase & Kuné* for the Netherlands give explicit estimates of the price elasticity. *Grandmont* attaches, as we do, great weight to equations based on an estimated price elasticity of unity. In our study for the Netherlands we found a price elasticity close to unity.

A large number of the studies take into account the possibility of short-term disequilibria, or, in other words, the possibility that the actual demand for money differs from the desired money holdings. This idea leads to a particular specification of the demand for money equations since the partial adjustment mechanism determines the underlying structure. Others introduced the concept of adaptive expectation with respect to one or more of the explanatory variables. A few authors combine both concepts, like *Villanueva* for Japan, *Laidler & Parkin* for England, *Grandmont* for France and *Fase & Kuné* for the Netherlands.

In case of a dynamic structure it is meaningful to distinguish between short-run and long-run elasticities. Where appropriate the elasticities shown in the table are long-run elasticities.

² In the Netherlands, unutilized credit lines are not counted as part of the money stock. *Cramer & Reekers* ([1972], page 90) estimate them at Fl. 9 billion as at the end of March 1971. It is noteworthy in this respect that as early as the twenties *Holtrop* [1928] advocated the inclusion of unutilized credit lines into the money stock.

The table* shows that the income elasticities are often smaller than unity, irrespective of the money definition that has been used. Some of *Price's* estimates are exceptionally high but, in all fairness it should be noted that he presents his results with ample reservations. *Grandmont's* income elasticities are also fairly high; they approach *Friedman's* well-known estimate of 1.81 (see *Friedman* [1969], page 126), which estimate, incidentally, was also found by *Price* in one case. However, we do not believe this similarity to be very significant. Another point to be noted is that many authors find a higher income elasticity with broad money than with narrow money. For Italy a similar situation occurs with notes/coin and deposits, which, according to our conjecture, may be due to the particular tax regime which seems to favour deposits. Our own income elasticity of 0.85 for the Netherlands lies somewhere in the middle.

The interest rate elasticities vary somewhat between countries. We see that in most of the cases the interest rate elasticity is also higher with broad money than with narrow money. The interest rate variables used are rather varied and show more subtle differences than the simple distinction between long and short-term suggests.

Some authors, like *Clinton*, *Teigen* and *Villanueva* (for Belgium) test the stability of their estimates over the various sub-periods, while *Ham-burger* investigates for Germany the predictive power of his demand function. Most of the results of the stability tests are satisfactory, although for Norway *Teigen* finds a tendency for the income elasticity to increase with time. Our own analyses of the stability of the demand for money in the Netherlands are in line with these findings.

Finally a few remarks on the methods used are in order. With the exception of *Leponiemi* for Finland, *Crouch* for England and *Haulman* for Canada, all authors study a single demand for money function. This procedure may introduce simultaneity biases as far as the supply of money is endogenous and dependent of the explanatory variables in the demand function. However, the results obtained by *Leponiemi*, *Crouch* and *Haulman* show only slight differences between simple least squares estimates and estimates taking into account simultaneity. Another point concerns the use of seasonally adjusted data. All authors, except *Crouch* and *Méltiz* in all but one case, take seasonal variation into account by using seasonally adjusted data or by introducing dummy variables. In our investigation of the demand for money for the Netherlands we did

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not find much difference between the two methods although from a statistical point of view we believe the use of dummy variables superior to the use of mechanically adjusted data. More important, however, is that we found the regressions results change considerably if any form of seasonal adjustment of the data is omitted.

Summary of empirical studies of the demand for money (quarterly data)

country	author	period of observation	concept of money	income variable	interest rate	income-elasticity	interest-elasticity	price-elasticity ^{a)}
Australia	Jüttner & Tackewell [26]	1952: I—1972: III	broad ^{b)} broad ^{b)}	GNP ^{b)} GNP ^{b)}	short long	0,89 à 1,01 0,92 à 0,97	— 0,17 à — 0,31 — 0,28 à — 0,50	*
Austria	Fürst, Schebeck & Schultz [15]	1954: I—1966: IV	narrow broad	GNP GNP	long long	0,91 à 0,96 0,92 à 1,46	— 0,18 à — 0,36 — 0,18 à — 0,43	—
Belgium	IMF [24]	not reported	narrow ^{b)}	industr. prod. ^{b)}	short	0,85	— 0,09	*
Canada	Villanueva [41]	1957: I—1969: IV	narrow ^{b)}	GNP ^{b)}	short	0,75	— 0,04	*
			narrow ^{b)}	GNP ^{b)}	long	0,71	— 0,15	*
			broad ^{b)}	GNP ^{b)}	short	1,03	— 0,04	*
			broad ^{b)}	GNP ^{b)}	long	0,95	— 0,04	*
Germany	Clinton [5]	1955: I—1970: IV	narrow ^{b)}	GNE ^{b)}	short	0,74 à 0,85	— 0,18 à — 0,30	*
			narrow ^{b)}	GNE ^{b)}	long	1,04	— 0,51	*
			broad ^{b)}	GNE ^{b)}	short	0,82 à 0,98	— 0,30 à — 0,66	*
			broad ^{b)}	GNE ^{b)}	long	0,78 à 1,20	— 0,79 à — 1,03	*
			narrow ^{b)}	GNE ^{b)}	short	0,61 à 0,64	— 0,04 à — 0,07	*
			narrow ^{b)}	GNE ^{b)}	long	0,51 à 0,65	— 0,07 à — 0,19	*
Germany	Haulman [22]	1947: I—1968: IV	broad ^{b)}	GNE ^{b)}	short	0,83 à 0,94	— 0,001 à — 0,05	*
			broad ^{b)}	GNE ^{b)}	long	0,66 à 0,92	— 0,004 à — 0,03	*
Germany	Hamburger [21]	1963: I—1970: IV	narrow	GNP	short	2,11	— 0,63	—
			narrow	GNP	short	0,93	— 0,09	—
Germany	König [27]	1957: I—1966: IV	narrow	GNP	long	0,98	— 0,35	—
			narrow	GNP	short	0,96 à 0,98	— 0,15 à — 0,18	—
Germany	Mattfeldt [31]	1950: I—1967: IV	(demand-deposits)	GNP	short	1,02	— 0,14€	—
			broad	GNP	short	0,97 à 1,09	€	—
Germany	Roskamp & Lahmas [35]	1953: I—1965: IV	narrow	GNP	short	1,02	— 0,07	—
			broad	GNP	short	1,35	— 0,08	—
Germany	Westphal [44]	1959: I—1967: IV	narrow	GNP	short	0,99 à 1,05	— 0,10 à — 0,12	—

<i>England</i>	<i>Crouch</i> [8]	1954: II—1965: II	(demand- nat. deposits) income demand- deposits + nat. deposits income narrow	long	1,02	— 0,88	—
	<i>Fisher</i> [12]	1955: I—1967: II	narrow income narrow pers. broad broad	long short long	1,08 0,54 à 0,56 0,66 à 0,68 0,69 à 0,71	— 0,48 — 0,09 à — 0,11 — 0,31 à — 0,36 — 0,003 à — 0,004	—
	<i>Goodhart</i> [18]	1955: III—1969: III	narrow GDP narrow GDP broad narrow broad ^b c)	short long short long short long	1,25 1,09 0,77 à 1,41 1,09 à 1,55 0,77 0,85	— 1,05 — 0,80 — 0,09 à — 0,21 — 0,35 à 0,51 — 0,15 — 0,24	—
	<i>Hamburger</i> [21]	1963: II—1971: II	narrow GDP narrow GDP broad ^b c)	long short long	0,74 0,61 à 1,08	— 0,09 à — 0,12	—
	<i>Laidler & Parkin</i> [29]	1956: II—1967: VI	narrow GDP narrow GDP broad ^b c)	short long short	— 2,38 ^d 0,42 à 0,84 1,00 à 2,47 0,55 à 1,81 2,29 2,27	— 9,52 ^d — 0,12 à — 0,86 — 0,03 à — 0,44 — 0,03 à — 1,46 — 0,30 — 0,36	17,33 ^d 0,34 à 1,79 — 0,00 à 0,90 0,06 à 2,31 0,90 0,41
	<i>Price</i> [34]	1956: I—1969: III 1964: I—1970: IV	narrow GDP narrow GDP broad narrow ^e narrow ^f	short long short long long short	0,39	— 0,08 (short) — 0,18 (long)	*
	<i>Hacche</i> [20]	1963: IV—1971: III	narrow ^b GNE broad ^b GNE broad ^b e) GNE broad ^b f) disposable pers. income	both short long both	0,45 0,93 0,51	— 0,09 — 0,07 — 0,07 (short) — 0,20 (long)	* * * *

country	author	period of observation	concept of money	income variable	interest rate	income-elasticity	interest-elasticity	price-elasticity ^{a)}
<i>Finland</i>	<i>Leponiemi</i> [30]	1952: I—1962: I	broad	GDP	none	1,19	—	—
<i>France</i>	<i>Grandmont</i> [19]	1960: I—1971: IV	narrow broad	GDP ^{b)}	short short	1,66 à 1,84 1,18	-0,19 à -0,21 -0,39	0,72 à 1,0 1,0 *
	<i>Méltiz</i> [32]	1959: I—1970: IV	narrow ^{b)} ^{c)}	GDP ^{b)} ^{c)}	long	0,65 à 0,70	-0,21	—
<i>Italy</i>	<i>Cotula</i> [6]	1958: I—1967: IV	coins deposits	labour income brute nat. income	long long: short	0,44 0,80	-0,26 -0,29	— —
	<i>Villanueva</i> [42]	1958: I—1971: I	narrow broad	GNE GNE	short short	1,01 1,92	-0,34 -0,08	— —
<i>Nether- lands</i>	<i>Dierick</i> [9] <i>Fase & Kuné</i> [10]	1951: I—1966: IV 1952: I—1971: IV	broad broad	net nat. income GNE	long long	1 ^{h)} 0,80 à 0,99	-0,17 -0,16 à -0,25	1 ^{h)} 0,97 à 1,06 *
<i>Norway</i>	<i>Teigen</i> [40]	1959: I—1969: IV	broad ^{b)}	GDP ^{b)}	none	0,91	—	—
<i>Switzer- land</i>	<i>Schelbert-Syfrig</i> [36]	1947: I—1963: II	narrow product	net nat. product	short	0,86 à 0,90	-0,18 à -0,76	—

a) * means that the price elasticity of the demand for nominal money, when real income is included, implicitly unity. — b) In fixed prices. — c) Per capita. — d) This result has no serious meaning. — e) Held by private households. — f) Held by firms. — g) Statistically not different from zero. — h) Implicitly.

Literature used

Adekunle, J. O.: "The Demand for Money: Evidence from Developed and Less Developed Economies", IMF Staff Papers, 15 (July 1968), pp. 220 - 266. — *Banerjee, B.*: "The Demand for Money in India: a Theoretical and Empirical Analysis", IMF Departmental Memorandum nr. 73, 1973 (mimeographed). — *Brown, A. J.*: "The Liquidity-Preference Schedules of the London Clearing Banks", Oxford Economic Papers, 1 (October 1938), pp. 49 - 82. — *Brown, A. J.*: "Interest, Prices and the Demand Schedule for Idle Money", Oxford Economic Papers, 2 (May 1939), pp. 46 - 69. — *Clinton, K.*: "The Demand for Money in Canada, 1955 - 70: some Single-Equation Estimates and Stability Tests", Canadian Journal of Economics, 6 (February 1973), pp. 53 to 61. — *Cotula, F.*: "La domanda di moneta", Rome: Banca d'Italia, 1970 (mimeographed). — *Cramer, J. S. & Reekers, G. M.*: "Het houderschap van liquiditeiten in Nederland". Amsterdam: NIBE, 1972. — *Crouch, R. L.*: "A Model of the United Kingdom's Monetary Sector", Econometrica, 35 (July to October, 1967) pp. 398 - 418. — *Dierick, A. M.*: "De liquiditeitsquote als variabele factor", Maandschrift Economie, 32 (December 1967), pp. 130 - 157. — *Fase, M. M. G. & Kuné, J. B.*: "De vraag naar liquiditeiten in Nederland, 1952 - 1971." Economist, 122, (July/August 1974) pp. 326 - 356. — *Feige, E. L. & Pearce, D. K.*: "A Methodological Survey of the Time Series Evidence on the Demand for Money and Money Substitutes", paper 7221, Social System Research Institute, University of Wisconsin, August 1972 (mimeographed). — *Fisher, D.*: "The Demand for Money in Britain, Quarterly results 1951 to 1967", The Manchester school of economic and social studies, 36, (December 1968) pp. 329 - 343. — *Frazer, W. J.*: "The Demand for Money", Cleveland: World Publishing, 1967. — *Friedman, M.*: "The Optimum Quantity of Money and Other Essays." Chicago: Aldine 1969. — *Fürst, E., Schebeck, F. & Schulz, J.*: "Die Geldnachfrage in Österreich", Zeitschrift für Nationalökonomie, 30 (1970), pp. 159 - 196. — *Gilbert, J. C.*: "The Demand for Money: the Development of an Economic Concept", Journal of Political Economy, 61 (April 1953), pp. 144 - 159. — *Goldfeld, S. M.*: "The Demand for Money Revisited", Brookings Papers on Economic Activity, 3 (1973), pp. 577 - 646. — *Goodhart, C. A. E.*: "The Importance of Money", Bank of England Quarterly Bulletin, 10 (June 1970), pp. 159 - 198. — *Grandmont, J. M.*: "On the Short-run and Long-run Demand for Money", European Economic Review, 4 (October 1973), pp. 265 - 287. — *Hacche, G.*: "The Demand for Money in the United Kingdom: Experience Since 1971", Bank of England Quarterly Bulletin, 14 (September 1974), pp. 284 - 305. — *Hamburger, M. J.*: "The Demand for Money in an Open Economy: Germany and the United Kingdom", paper Fourth Konstanzer Seminar on Monetary Theory and Monetary Policy, Insel Reichenau, June 1973 (mimeographed). — *Haulman, C. A.*: "A Structural Model of the Canadian Monetary Sector", Southern Economic Journal, 38 (January 1972) pp. 336 - 349. — *Holtrop, M. W.*:

“De omloopsnelheid van het geld”, Amsterdam: H. J. Paris (1928). — *Humphrey*, M. H.: “Evolution of the Concept of the Demand for Money”, FRB of Richmond quarterly review, 59 (December 1973). — *IMF*: “Rapport SM/74/110”, Belgium-Luxemburg recent economic developments (May 14, 1974). — *Jüttner*, D. J. & *Tuckwell*, R. H.: “Partial Adjustment, Multiple Expectations and the Demand for Money in Australia”, Kredit und Kapital, 7 (Heft I, 1974), pp. 48 - 68. — *König*, H.: Einkommenskreislaufgeschwindigkeit des Geldes und Zinssatzveränderungen: eine ökonometrische Studie über die Geldnachfrage in der BRD”, Zeitschrift für die gesamte Staatswissenschaft, 124 (1968) pp. 70 - 90. — *Laidler*, D.: “The Demand for Money: Theories and Evidence.” Scranton: International Textbook Co (1969). — *Laidler*, D. & *Parkin*, M.: “The Demand for Money in the United Kingdom 1956 - 1967: Preliminary Estimates”, The Manchester school of economic and social studies, 38 (September 1970) pp. 187 - 208. — *Leponiemi*, A.: “On the Demand and Supply of Money: The Evidence from the Quarterly Time Series in the United States, the United Kingdom and Finland 1949 - 1962”, Helsinki: The Finish economic association, economic studies, 27 (1966). — *Mattfeldt*, H.: “Untersuchungen zur Stock-Adjustment Hypothese”, Konjunkturpolitik, 20 (1974) pp. 113 - 127. — *Méltiz*, J.: “La demande de monnaie en France: tentative d'explication”, Statistiques & études financières, 11, Direction de la Prévision, Ministère de l'Economie et des Finances, 1972. — *Nieuwenburg*, C. K. F.: “Het liquiditeitsbezit van gezinshuishoudingen in Nederland.” Deventer: AE. E. *Kluwer* (1969). — *Price*, L. D. D.: “The Demand for Money in the United Kingdom: A Further Investigation”, Bank of England Quarterly Bulletin, 12 (March 1972), pp. 43 - 55. — *Roskamp*, K. W. & *Laumas*, G. S.: “The Rate of Interest and the Demand for Money”, Weltwirtschaftliches Archiv, 103 (Heft 1, 1969), pp. 150 - 155. — *Schelbert-Syfrig*, H.: “Empirische Untersuchungen über die Geldnachfrage in der Schweiz”, Zürich: Zürcher Volkswirtschaftliche Forschungen, Neue Folge 12 (1967). — *Silveira*, A. M.: “The Demand for Money: The Evidence from the Brazilian Economy”, Journal of Money, Credit and Banking, 5 (February 1973) pp. 113 - 140. — *Smith*, L. B. & *Winder*, J. W. L.: “Price and Interest Expectations and the Demand for Money in Canada”, Journal of Finance, 26 (June 1971), pp. 671 - 682. — *Teigen*, R. L.: “The Demand and Supply of Money” in: W. L. *Smith* & R. L. *Teigen* (ed): Readings in Money, National Income, and Stabilization Policy, Homewood Ill.: Irwin (1970), pp. 74 - 112. — *Teigen*, R. L.: “The Demand for Money in Norway”, 1959 - 1969, Statsökonomisk Tidskrift, 85 (September 1971), pp. 65 - 99. — *Villanueva*, D. P.: “Simple Demand-for-Money Functions in Belgium: Parameter Estimates and Stability Tests”, IMF Departmental Memorandum nr. 33 (1971) (mimeographed). — *Villanueva*, D. P.: “Permanent Income and Partial Adjustment in the Monetary Sector: The Case of Japan.” IMF Departmental Memorandum nr. 32 (1972) (mimeographed). — *Walters*, A. A.: “The *Radcliffe* Report — Ten Years After,

a Survey of Empirical Evidence", in: D. R. Croome & H. G. Johnson (ed.): Money in Britain 1959 - 1969, Oxford: University Press (1970), pp. 39 - 68. — Westphal, U.: Theoretische und empirische Untersuchungen zur Geldnachfrage und zum Geldangebot, Tübingen: J. C. B. Mohr (Paul Siebeck), Kieler Studien 110 (1970).

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Zusammenfassung

Die Geldnachfrage in 13 europäischen und außereuropäischen Ländern

Die Studie gibt einen Überblick (S. 414 ff.) über die bedeutendsten Untersuchungen zur Geldnachfrage in zehn europäischen Ländern sowie in Australien, Kanada und Japan. Nicht berücksichtigt werden Beiträge über die Vereinigten Staaten und Entwicklungsländer. Außerdem haben sich die Autoren auf vierteljährliche Zeitreihenanalysen beschränkt. Die Tabelle enthält die wesentlichsten Darstellungen der erwähnten Untersuchungen.

Summary

The demand for the money in 13 European and non-European countries

This study gives a survey (pp. 414) of the most important money studies on demand for money carried out for ten European countries, Australia, Canada and Japan. Excluded are the contributions on the United States and the developing countries. Furthermore the authors confined themselves to time series analyses based on quarterly data only. The tabular survey lists the most important features of the reported studies.

Résumé

La demande monétaire dans 13 pays européens et extra-européens

L'étude fournit un aperçu (p. 414) des plus importantes recherches effectuées sur la demande monétaire dans dix pays européens ainsi qu'en Australie, au Canada et au Japon, tandis que furent négligés les Etats-Unis et les pays en voie de développement. Les auteurs se sont en outre limités à des analyses périodiques trimestrielles. Le tableau présente les principales données des recherches précitées.

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