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ESTIMATES OF DEMAND FOR MONEY AND CONSUMPTION FUNCTIONS FOR THE HOUSEHOLD SECTOR IN POLAND, 1967-1999

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ABSTRACT

The paper analyses household money demand and consumption. Variables that measure shortage and expectations about its future course are introduced to capture the effects of the transition from centrally planned to market economy. The Johansen procedure is used to identify a system of the two cointegrating vectors. The Chow tests support stability in the error correction equations. The reported results show that disequilibrium in household sector money holdings has a strong influence on consumption.

JEL classification: E21, E41, P36

Keywords: Money Demand, Consumption, Shortage

1. Introduction

The paper presents an estimate of a two-equation system using Polish annual data for the period 1967-1999. The underlying hypothesis is that personal sector broad money is jointly determined with consumption expenditure. Finding stable demand for money and consumption functions for the period in question requires identification of variables which capture the systemic change the countries of East Central Europe went through in the early 1990s. The process of transition from socialism to capitalism has clearly been a multidimensional one. It involves price and foreign trade liberalisation, hardening of budget constraints for the enterprise sector, transfer of a sizeable share of productive assets into private hands and reform of the financial system. Can such a complex process be captured by an evolution of a small number of explanatory variables? The contention of the paper is that it can, at least as it relates to the personal sector.

The most drastic changes the personal sector was subject to were ending of "overfull employment" and shortages in consumer goods markets. Shortage led to monetary overhang, i.e. holdings of money due to frustrated attempts to buy goods at regulated prices in the state shops and to transactions in the secondary markets where prices were higher. Ending of shortage decreased the households' demand for money. On the other hand the consequences of the much tighter labour market are less clear cut. Income uncertainty is not necessarily correlated with fluctuations in unemployment. Under socialism variations in aggregate personal incomes followed directly from application of specific price and income policies. The chances of becoming unemployed during the 1990s have been particularly high for the poorer sections of society. Given also that those in the lower deciles of income distribution

save little (see Liberda,1999) it can be argued that the emergence of unemployment has had a limited effect on the savings ratio. Yet the ratio was much higher in the 1990s than in the previous decades. It can be hypothesised that this was due to (a) a decline and an expectation of a further decline in publicly financed consumption, (b) an increase in uncertainty about the future income streams, and (c) ending of constraints on wealth accumulation by individuals. These three factors started to operate at the time when shortage disappeared. Consequently it should be possible to account for the regime change in the determination of consumption by controlling for the effects of shortage. Before 1990 the availability of goods at controlled prices in state shops regulated the level of consumption in a direct manner. The paper postulates that what looks like a post-1990 permanent increase in the saving ratio was due to a wider set of factors associated with the transition to a market economy rather than solely to the replacement of regulated by market equilibrium prices.

Much has been written on the measurement of shortage in the centrally planned economies and the household sector's reaction to it. The major issue within the literature has been the size of the monetary overhang and its evolution over time. The most obvious way of estimating the overhang is to introduce a shortage variable into the demand for money function. Once such a function passes stability tests it can be argued that the part of total money stock explained by the variable amounts to an estimate of the monetary overhang. The problem however is that we are unable to to impose stringent priors on the function. In particular it makes little sense to impose a unitary income elasticity of demand. All transition economies can be seen as suffering from deep and prolonged monetary disequilibrium. The currency reforms applied under central planning in the early 1950s effectively confiscated financial wealth from those who held more than minimal money balances. It took a long time for the

memory of this event to recede. It is worth noting that as recently as 1991 the Russian government declared that the banknotes of the highest denomination at the time (500 rubles) were to be no longer a valid means of payment and allowed only a limited conversion of these banknotes into lower denominations. Postulating a long run income elasticity of demand for broad money greater than unity amounts to postulating a deep initial disequilibrium in asset holdings which takes at least several decades to correct. The rate at which the disequilibrium is corrected depends on the nature of the utility functions of the households. A large number of demand for money functions with constant income elasticity in the range 1.2-1.8 has been estimated for various national economies. For instance, Cuthbertson and Galindo (1999) arrive at the estimate of income elasticity of demand for broad monetary aggregate in Mexico of 1.5. However those estimates have not been supported by examples of plausible utility functions which, in the relevant institutional framework, would be compatible with the numerical values of elasticity obtained.

An advantage of identifying the size of monetary overhang within a system of demand for money and consumption equations is that for the consumption equation, in the absence of wealth effects, a unitary income elasticity has to be obtained. Thus we should have a greater confidence in the result arrived at because it is embedded in the framework where some standard long-run relationships prevail.

The rest of the paper is organised as follows. Section 2 characterises the data set. Section 3 identifies the long-run relationships. An I(0) system of equations for the first differences of real money and consumption is presented in section 4. The following section discusses the effect of shortage on the demand for money and consumption. The final section concludes with a discussion of wealth effects.

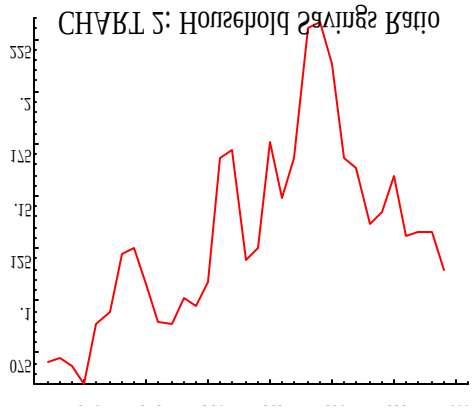
2. Time-series Data

Personal Income and Consumption

The Polish CSO has applied the standard national accounting procedures (SNA93) to calculate personal consumption for 1990-1999 and savings for 1991-1999. The SNA93 consumption figure for 1990 in current prices is 2% larger than that calculated according to the previously applied method. Most of this difference is due to an increase in the allowance for depreciation of residential buildings. Over the last few years the CSO revised the national accounts figures for the period since 1994 to take better account of the grey economy, the pre-1994 figures remained unrevised. However the research unit attached to the CSO produced, on a consistent basis, the series on major components of GDP for 1985-1995 in 1992 prices (see Zienkowski,1999). The consumption series used in this paper excludes non-marketed food consumption by farmer households.

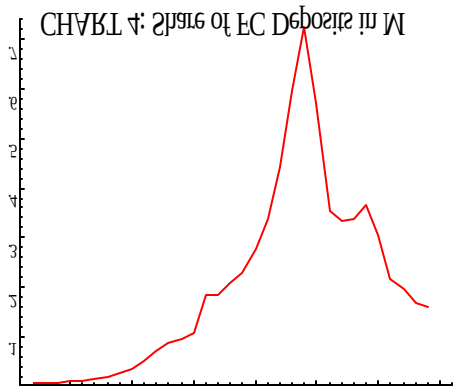
Up to 1990 the personal savings were the sum of an increase in money balances, change in personal bank debt, residential housing investment, and business investment of the private farming sector. Since 1990 the households have been able to accumulate non-monetary financial assets. The CSO produced financial accounts for 1995-1997. It can be calculated from them that purchases of non-monetary financial assets by households were, respectively, 3, 5, and 11% of the gross household savings. The CSO has recently revised upwards the savings figures for 1994-1998. The 1991-1993 figures have remained unrevised. The 1994 figure for savings in real assets was increased by 60%. It seems to be appropriate to increase the corresponding figures for 1991-1993 by, respectively, 15, 30, and 45% (see Liberda, 1999). The pre-1991 savings figures were arrived at by summing up savings in real assets, as given by the CSO national income yearbooks, and monetary savings. Given the somewhat

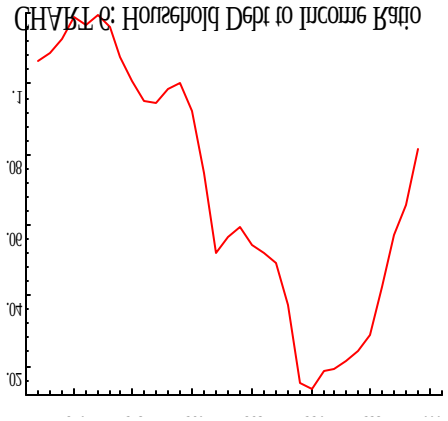
questionable character of the data on the stock of animals and plant crops in the private farming sector, they were excluded from the series.



Money and Credit

The broad money series is formed as described in Chawluk and Cross (1994). It needs to be noted that for most of the period Poland was effectively a dual currency economy. By aggregating domestic cash and deposits and foreign currency deposits (mainly US$) a high degree of substitution between the two is assumed. What is missing from the aggregate is foreign currency cash holdings on which, for obvious reasons, no data is available. Does this distort the aggregate in a serious manner? It can be argued that confidence of the households in the safety of their dollar bank deposits increased only gradually. Dollars not deposited in the banks can be seen as lacking sufficient liquidity to be subsumed under the heading of monetary assets. Charts 3-6 graph, respectively, the monetary aggregate deflated by the 1999 prices, the share of foreign currency deposits in the aggregate, the money to income ratio, and the household bank debt to income ratio.

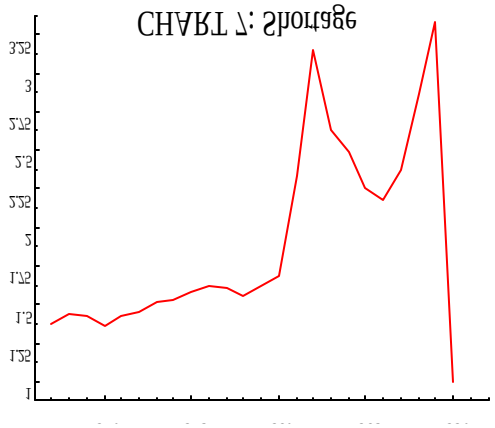


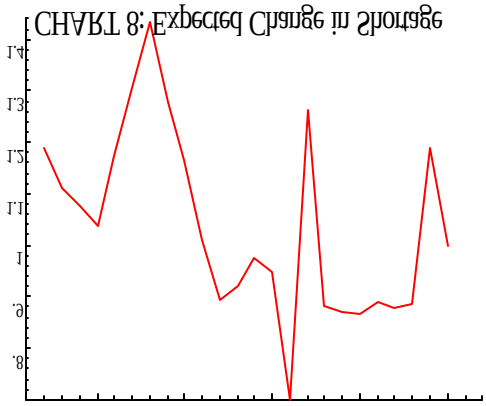


Shortage

The variable which measures, most directly, the intensity of shortage is the ratio of sales to inventories in the state retail shops. For details of its calculation see Chawluk and Cross (1994). Given the changes that have occurred in the organisation of retail trade since the beginning of 1990, the ratio in question can only measure relative intensity of shortage during the pre-transition (shortage) period. To obtain the "absolute" measure of shortage the following procedure was applied. The 1990 and beyond values of the variable were set equal to 1. The 1989 value was set equal to the reciprocal of the ratio of 1989 to 1990 real unofficial exchange rate. The pre-1989 values of the variable were set on the basis of their relative values. The black

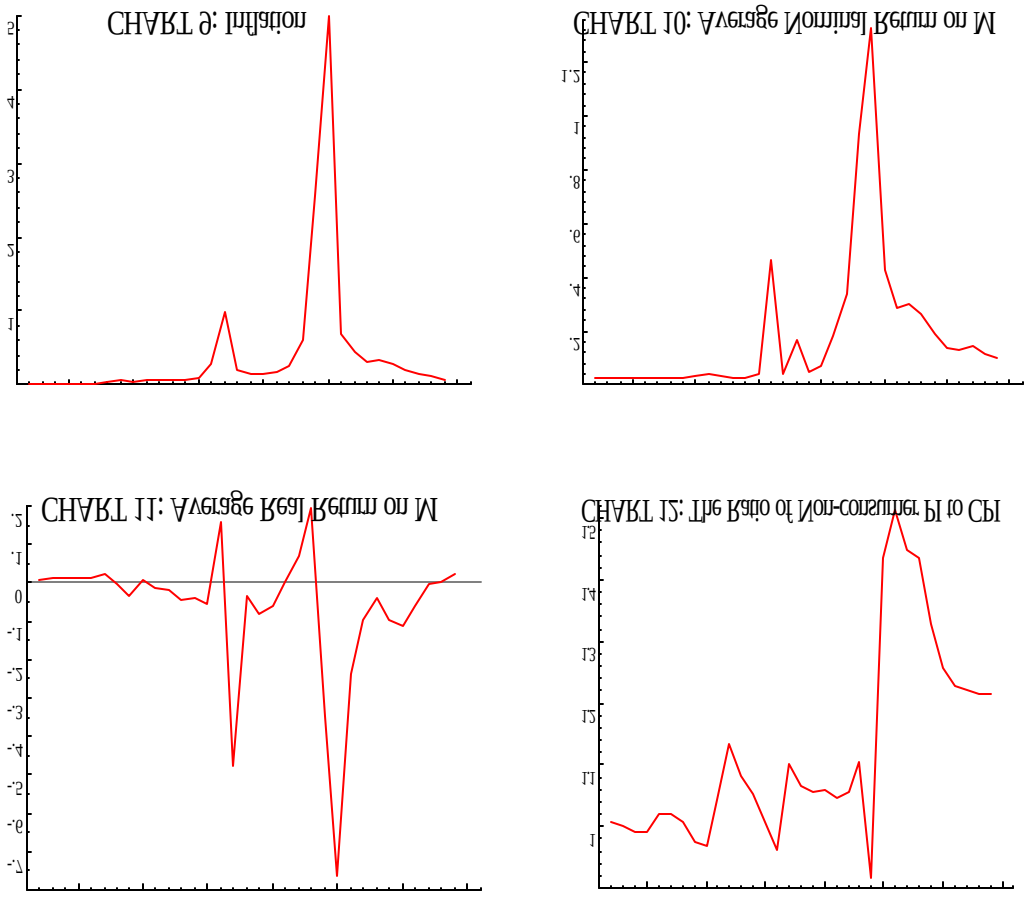
market/unofficial exchange rate was closely correlated with shortage intensity. Clearly, since 1990 shortage ceased to be a determinant of the exchange rate.





An innovation applied in the present paper is an introduction of expectations about the future level of shortage and inflation into the analysis. Household behaviour when shortage is expected to diminish is likely to be different than in the situation when it is expected to remain constant or increase. It is postulated that the expectations in question are captured by the level of black market real exchange rate relative to that of shortage. The real exchange rate is calculated as the product of the nominal black market zloty/dollar rate and Polish consumer price index divided by the US Producer Price Index (Finished Consumer Goods Excluding Food).The PPI was used since it approximates world prices of tradables. Those prices are relevant given the arbitrage activities of the Polish private traders. The RER variable was transformed to match the shortage variable by mean and range. The ratio of the first to the second gives us the Expected Change in Shortage (ECS) variable.

Inflation, Rate of Return, and Relative Price of Consumption and Non-Consumption Goods and Services



The price index used to deflate nominal variables is the national accounts consumption deflator. As in Thomas (1997), the rate of return introduced into the model is an own-weighted average return on personal sector broad money. The real rate of return represents the opportunity cost of holding money. The model to be presented in the next section also postulates that the relative price of non-consumption goods and services (housing construction materials, agricultural machinery and material inputs) purchased by the households affects the demand for money.

3. Long-run Relationships

The variables that enter the model are listed below under two headings: I(1) and I(0) variables. Their order of integration was determined on the basis of appropriate ADF tests. Lower case letters denote logs.

I(1) variables: *m* is real money, *c* is real private consumption, *y* is real personal income, *s* is shortage, *SLS* is shortage times log of shortage, and *nctc* is the ratio of non-consumption to consumption price indices.

I(0) variables: *rr* is 1 + real rate of return, *Drr* is first difference of *rr*, *ecs* is the ratio of adjusted real exchange rate to shortage, *ecs1* is *ecs* lagged one period, *DLD* is the first difference of log of the average real bank debt of the household sector, and *V6Dy* is the absolute deviation between current income growth and the average income growth over the last 6 years - it measures income uncertainty.

To interpret the econometric results presented in this and the next sections it is important to note that stable demand for money equation can be estimated as a single equation. Not much is gained in term of its test statistics and goodness of fit when it is estimated jointly with the consumption function. Table 1 presents cointegration test statistics for the system which consists of *m*, *y*, *s*, *SLS*, and *nctc* entered as endogenous variables with one lag, *rr*, *Drr*, *ecs*, *ecs1*, and *DLD* entered as unrestricted variables, and an unrestricted constant term.

TABLE 1: Cointegration Tests for a System Without *c*

	Eigenvalue test			**Trace test**		
Ho:rank=p	-Tlog(1-μ)	T-nm	95%	-TΣ log(1-μ)	T-nm	95%
p == 0	46.73**	39.65**	33.5	92.46**	78.45**	68.5
p <= 1	22.69	19.25	27.1	45.72	38.8	47.2
p <= 2	19.41	16.47	21.0	23.04	19.55	29.7
p <= 3	3.58	3.04	14.1	3.62	3.07	15.4
p <= 4	0.04	0.03	3.8	0.04	0.03	3.8

Taking *m* to be the only endogenous variable and restricting the last four elements of the a vector to take zero values the following cointegrating vector is obtained.

$$m = 1.6157y + 1.4685s - 0.35408SLS - 0.26392nctc \qquad (1)$$

The test of the restrictions on a is: $\chi^2(4) = 1.3421$ [0.8542]. Thus they cannot be rejected which signifies that the necessary condition for long-weak exogeneity is satisfied. The relationship (1) differs little from the long-run demand for money equation estimated on quarterly data, 1965.1-1993.2, in Chawluk and Cross (1994).

We now add to the system *c* and *V6Dy* variables. We begin by estimating a closed VAR model, where all I(1) variables are endogenous. Given that the sample period (1967-1999) contains only 33 observations a lag length of one is desirable provided that the VAR passes the standard tests. We obtain: vector AR 1-2 F(72,22) = 1.685 [0.085] and vector normality $\chi^2(12) = 14.23$ [0.286]. For the individual equations there are only two failures in the standard set of tests. There are: *m* equation normality $\chi^2(2) = 6.633$ [0.036] and *y* equation normality $\chi^2(2) = 9.005$ [0.011]. It is perhaps acceptable to proceed to cointegration analysis without introducing dummy variables to improve the test statistics. It can be noted that the shortage variables take the values of zero after 1989.

TABLE 2: Cointegration Tests for the Full System

	Eigenvalue test			**Trace test**		
Ho:rank=p	-Tlog(1-μ)	using T-nm	95%	-TΣ log(1-μ)	using T-nm	95%
p == 0	67.29**	55.05**	39.4	160.2**	131.1**	94.2
p <= 1	40.42**	33.07	33.5	92.95**	76.05*	68.5
p <= 2	31.65*	25.9	27.1	52.53*	42.98	47.2
p <= 3	16.41	13.42	21.0	20.88	17.09	29.7
p <= 4	3.87	3.16	14.1	4.47	3.66	15.4
p <= 5	0.60	0.49	3.8	0.60	0.49	3.8

Although the results suggest at least three cointegrating vectors, we proceed on the basis of only two endogenous variables: m and c. To justify this a test of long-weak exogeneity is carried out.

TABLE 3: Test of Long-weak Exogeneity

Identified cointegrating vectors

	m	*c*	*y*	*s*	*SLS*	*nctc*
β_1 :	1.000	0.000	-1.604	-1.438	0.349	0.276
β_2 :	0.000	1.000	-0.983	-0.245	0.0704	-0.0097

Standardised loading coefficients

	α_1	α_2
m	-0.45254	-0.14461
c	0.26356	-0.75728
y	0.00000	0.00000
s	0.00000	0.00000
SLS	0.00000	0.00000
nctc	0.00000	0.00000

Identifying restrictions imposed: four exact identifying restrictions and eight restrictions on a.

loglik = 695.785 unrestr. loglik = 702.25
LR-test, rank=2: $\chi^2(8) = 12.929$ [0.1143]

Finally, two overidentifying restrictions were imposed. β_{23} was set equal to -1 to ensure unitary income elasticity of consumption, and β_{26} was set equal to zero given that its initial estimated value was not significantly different from zero. The two cointegrating vectors obtained were:

$$m^* = 1.623y + 1.467s - 0.355SLS - 0.287nctc \quad (2a)$$

$$c^* = y + 0.271s - 0.076SLS \quad (2b)$$

The joint test of the restrictions on a and the two overidentifying restrictions is $\chi^2(10) = 13.605$ [0.1918].

4. Error Correction Model

We can now proceed to mapping the I(1) conditional system to I(0) space by formulating a vector error correction mechanism (VECM), where the two error correction terms are $(m-m^*)$ and $(c-c^*)$.

TABLE 4: Conditional VECM

Reduced form equation for Dm_t

Variable	Coefficient	Std.Error	t-value	t-prob
$(m-m^*)_{t-1}$	-0.461	0.086	-5.341	0.0000
$(c-c^*)_{t-1}$	-0.063	0.155	-0.404	0.6902
Dy_t	0.248	0.129	1.917	0.0696
Ds_t	0.014	0.169	0.084	0.9338
$DSLS_t$	-0.009	0.041	-0.224	0.8249
$Dnctc_t$	-0.057	0.070	-0.811	0.4268
rr_t	0.567	0.051	11.105	0.0000
Drr_t	0.037	0.022	1.695	0.1055
ecs_t	0.268	0.042	6.332	0.0000
ecs_{t-1}	0.037	0.042	0.886	0.3864
DLD_t	0.071	0.036	1.963	0.0637
$V6Dy_t$	-0.078	0.152	-0.515	0.6119
Constant	-2.094	0.389	-5.388	0.0000

Reduced form equation for Dc_t

Variable	Coefficient	Std.Error	t-value	t-prob
$(m-m^*)_{t-1}$	0.258	0.058	4.448	0.0002
$(c-c^*)_{t-1}$	-0.699	0.104	-6.722	0.0000
Dy_t	0.564	0.087	6.503	0.0000
Ds_t	0.231	0.114	2.032	0.0556
$DSLS_t$	-0.055	0.028	-1.989	0.0606
$Dnctc_t$	0.052	0.047	1.106	0.2819
rr_t	-0.051	0.034	-1.503	0.1485
Drr_t	-0.041	0.015	-2.831	0.0103
ecs_t	0.034	0.028	1.187	0.2493
ecs_{t-1}	-0.018	0.028	-0.646	0.5257
DLD_t	0.163	0.024	6.708	0.0000
$V6Dy_t$	-0.655	0.102	-6.434	0.0000
Constant	1.122	0.261	4.302	0.0003

$\sigma_m = 0.0168$, $\sigma_c = 0.0113$
R^2(LR) = 0.9998, R^2 (LM) = 0.9795
F-test on all regressors, F(26,38) = 108.99 [0.0000] **
Correlation between the residuals is 0.526

Since *(c-c*)* is insignificant in the demand for money equation its autonomy, as demonstrated by similarity of (1) and (2a) is confirmed. The causality seems to run in one direction, from *m* to *c*.

The preferred structural model, resulting from an imposition of overidentifying restrictions, is given below.

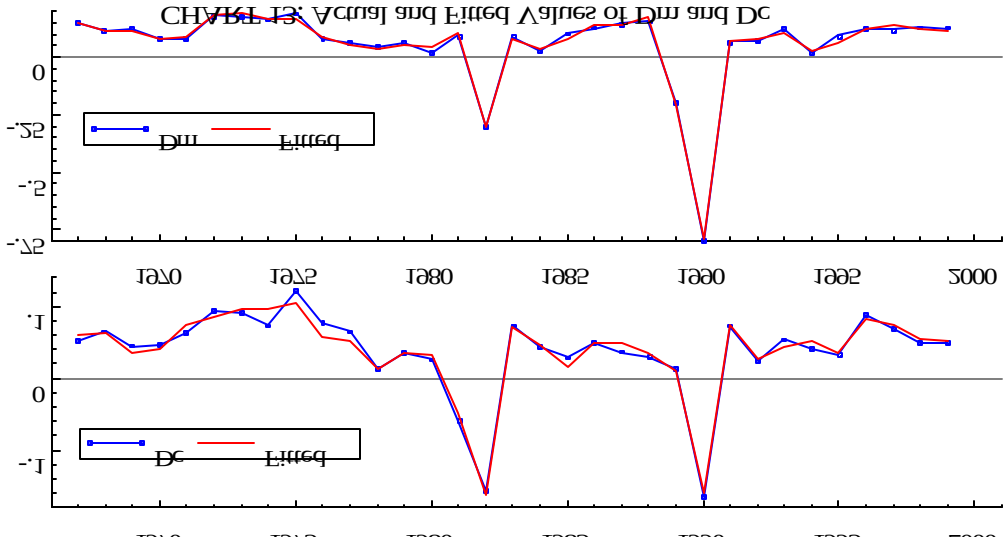
$$\begin{aligned} Dm_t = & \underset{(8.48)}{-0.48(m-m^*)_{t-1}} + \underset{(1.41)}{0.20Dc_t} + \underset{(1.26)}{0.16Dy_t} + \underset{(25.03)}{0.57\,rr_t} + \underset{(2.77)}{0.04Drr_t} + \\ & \underset{(8.74)}{0.29ecs_t} + \underset{(1.70)}{0.04\,ecs_{t-1}} + \underset{(3.37)}{0.05DLD_t} - \underset{(8.14)}{2.17} \end{aligned} \qquad (3a)$$

s.e. = 0.0153, AR1-2 F(2,18) = 2.164 [0.144], Normality $\chi^2(2)$ = 0.475 [0.7884], ARCH 1 F(1,18) = 1.274 [0.2738]

$$\begin{aligned} Dc_t = & \underset{(4.52)}{0.25(m-m^*)_{t-1}} - \underset{(6.94)}{0.69(c-c^*)_{t-1}} + \underset{(6.78)}{0.53Dy_t} + \underset{(1.76)}{0.17Ds_t} - \underset{(1.75)}{0.04DSLS_t} - \underset{(1.38)}{0.04rr_t} \\ & - \underset{(2.84)}{0.04Drr_t} + \underset{(1.36)}{0.03ecs_t} + \underset{(7.22)}{0.16DLD_t} - \underset{(7.63)}{0.58V6Dy_t} + \underset{(4.36)}{1.09} \end{aligned} \qquad (3b)$$

s.e. = 0.0109, AR1-2 F(2,18) = 2.611 [0.1011], Normality $\chi^2(2)$ = 0.949 [0.6222], ARCH 1 F(1,18) = 3.355 [0.0836]

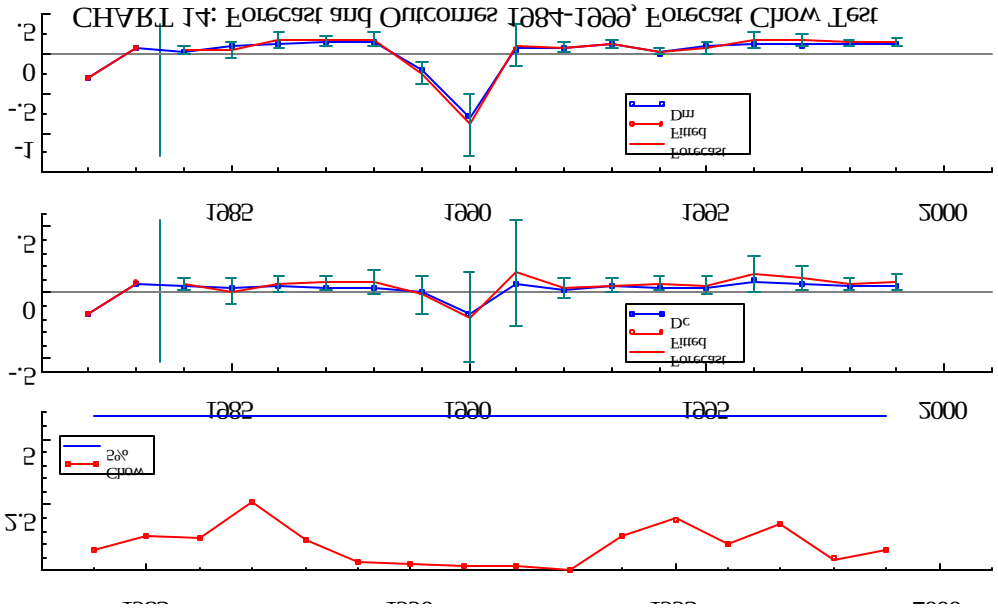
Vector portmanteau 4 lags = 28.938, Vector AR 1-2 F(8,36) = 2.125 [0.0588], Vector normality $\chi^2(4)$ = 4.016 [0.4039], LR test of over-identifying restrictions: $\chi^2(6)$ = 7.00 [0.3209], correlation between the residuals is 0.344

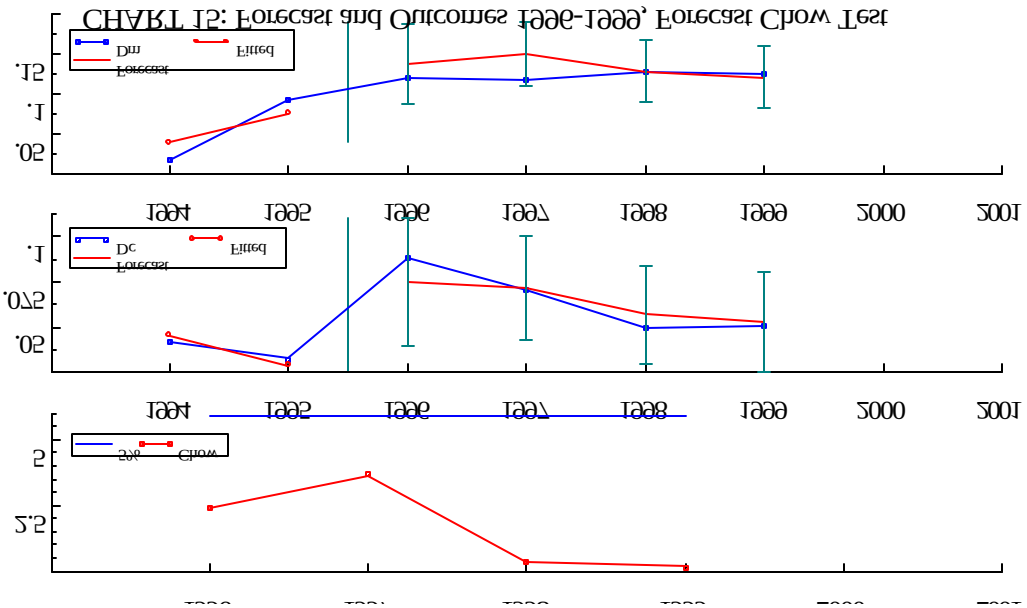


The table below and the two charts that follow show the stability properties of the two estimated equations.

TABLE 5: Stability Tests

Forecast Period	Test using W (an index of numerical parameter constancy which ignores parameter uncertainty)	Test using V[**e**] (parameter uncertainty is taken into account)
1984 to 1999	F(32,7) = 6.14 [0.009]	F(32,7) = 0.49 [0.922]
1990 to 1999	F(20,13) = 4.95 [0.003]	F(20,13) = 0.72 [0.754]
1992 to 1999	F(16,15) = 0.76 [0.706]	F(16,15) = 0.58 [0.851]
1996 to 1999	F(8,19) = 0.68 [0.700]	F(8,19) = 0.50 [0.843]





5. Shortage Induced Money Holdings and Consumption

The shortage variable figures prominently in the two estimated coin tegrating vectors. Equations (2a) and (2b) tell us that money holdings and consumption explained by shortage are given by, respectively, 1.467*s* - 0.355*SLS* and 0.271*s* – 0.076*SLS*. Charts 16 and 17 show the ratio of those magnitudes to personal income.

Are the estimates of shortage induced money holdings and consumption compatible with theoretical models of consumer optimisation under rationing? The literature offers analyses of the case where there are no storable goods (Acharya and Spagat, 1993 and 1995) and the case where, given storability, an optimal inventory policy can be determined (Weitzman, 1991).

Acharya and Spagat show that with linear utility, constant consumer good market conditions and binding liquidity constraints the existence of shortage does not have any effect on the savings ratio. They then show that a combination of high prices in the parallel markets and some positive probability that the supply of low priced goods in the state shops will increase generates positive savings even if some discounting is applied to consumption. Such a savings is labelled speculative. "The consumer refrains from spending all of his money when he is forced to buy on the second economy, because he expects that soon he will be able to make a large purchase at the lower first-economy price. In other words, he is speculating that he

will soon face a better price." (Acharya and Spagat, 1995, p.312) A strongly concave utility function generates precautionary savings. When the intensity of shortage is low but some positive probability is attached to its increase the consumer will save in order to be able to finance the future high price purchases in the parallel markets.

Can these two savings motives explain the monetary overhang which varies, as depicted in Chart 16, between 7% and 23% of annual income? Perhaps some scepticism is in order about the figures in the upper reaches of the range. However it can be argued that the estimated figures result from an incomplete account of the parallel markets in the official data. This led to underestimation of the price and nominal income levels. The 1980s were the period of high shortage. The high price level in the parallel markets led to a high transaction demand for money. It is likely that a part of those transaction balances show up in the estimate of the monetary overhang.

It should be noted that changes in the measure of shortage are absent in equation (3a). On the other hand the shortage expectations variable is highly significant there. In a general way this accords with the role given to expectations in the Acharya and Spagat analysis. The importance of expectations is particularly striking for the early 1970s period. It can be seen from Chart 3 that household money balances doubled between 1971 and 1975 while, as seen in Chart 8, consumer expectations about the future evolution of shortage were highly optimistic. This optimism can be traced to the new economic policy adopted by the government. The imports of both consumer and investment goods from the West were greatly expanded. The idea was to create a modern export sector which in due course would generate sufficient hard currency earnings to repay the incurred debt while maintaining a broad balance in the consumer goods market. Both the range and quality of consumer goods available in the state

shops improved markedly. It appeared sensible for the households to extrapolate this favourable trend into the future.

Turning to Chart 17, the estimated magnitude of shortage induced consumption appears somewhat less plausible than that of the estimated monetary overhang. Under the conditions of shortage some effort-cost, in addition to money cost, is needed to obtain goods. If the goods are storable, and if after queuing as much as is wanted can be bought, there will be a shift of inventory holdings from shops to consumers. It should be noted that the earlier models of consumer optimisation under shortage, for instance Kornai and Weinbull (1978) and Stahl and Alexeev (1985), assumed that only a limited amount of the good can be bought at any one time. Dispensing with this assumption allowed Weitzman (1991) to analyse the optimal inventory holdings by consumers. His comparative-statics analysis shows that an increase in shortage (price deformation) leads to increased hoarding of storable goods. Turning to dynamics, he also shows that during the transition from a low-shortage to high-shortage steady state consumption is lower than in either steady state. This is required to allow the inventories to move up towards their new higher equilibrium level. In the process the effort-cost of making purchases becomes large enough to induce consumers to postpone purchases until the queues shorten. This effect can explain large falls in the shortage induced consumption in the early and late 1980s when not much was left on the shelves in the state shops.

There are two features of the time series graphed in Chart 17 that appear to be objectionable. First, the magnitude of shortage-induced consumption (accumulation of storable goods) is large, and second, the share of consumption in income increases only by 1-1.5 percentage points as shortage evolves from a low (1960s) to a moderate (1970s) and then to a high (mid-1980s) level. It was argued in the introduction that a

shift to a higher savings ratio in the 1990s was largely due to a varied set of factors associated with the systemic change. Under socialism the incentive to save was less. The argument can be extended to postulate that during the period of socialism a gradual relative decline in publicly financed consumption and social insurance led to an increase in the savings ratio. Thus in the 1980s the state provided much less new subsidised residential housing and private expenditure on health and education increased markedly. This decline was correlated with an upward trend in shortage. The non-log linear form of the shortage variable allows it to reflect a wider set of influences on the savings ratio.

5. Conclusion

The estimated model shows that disequilibrium in personal sector money holdings has a strong influence on consumption. This can be seen as a kind of wealth effect. There are no other wealth effects in the model. In the period of socialism the only financial assets available were monetary assets. In the post-socialist period equity and bonds holdings appeared in the portfolios of households. The scale of those holdings, however, is still substantially less than in the developed market economies. The Polish Central Statistical Office has only recently published data on wealth stocks held in the major sectors of the economy (CSO, 1999). They were compiled in broad accordance with SNA'93 and ESA'95. The data for the household sector are summarised in Table 6. In due course it will be interesting to analyse the effects of such wealth holdings on consumption.

TABLE 6 : Value of Assets Held by the Households at the End of the Year
(zloty billion)

	1994	1995	1996	1997
Fixed assets (mainly residential housing)	201.9	217.0	234.7	232.1
Currency and deposits	53.6	76.1	98.8	130.3
Shares and other equity	21.0	28.9	26.7	40.2
Securities other than shares	1.2	2. 2	3.7	3.2

It was argued earlier that the estimated income elasticity of demand for money in excess of unity signifies a "long-run disequilibrium" in money holdings, the implication being that it will take the households some decades to arrive at desired money to income ratio. A similar argument can be applied to a wider class of financial assets. There were certainly periods during the 1990s when large capital gains were made on equity holdings. However given a desire to arrive at a more diversified portfolio of financial assets, and relatively low initial financial wealth, there may have been no large effects of these capital gains on consumption. There were no pronounced trends in the aggregate market valuation of the privately owned housing stock during the 1990s. On the other hand the variation in house prices between different regions and localities became more marked. However the property market remains underdeveloped in comparison with that in advanced market economies and the legal system is still not conducive to an expansion of lending secured on property.

The only rate of return employed in the model is the real rate of return on money holdings. This amounts to the assumption that the key choice facing the households is that between consumption and the level of real money balances. Currency substitution

is not modelled explicitly. The reported results support the hypothesis of high substitutability between dollar and domestic currency deposits.

The annual data set, with only 33 observations, made it impossible for recursive estimates to be used in the stability analysis. However the reported Chow tests are unambiguous in supporting stability in the error correction equations. The stability result can be seen as surprising given both the systemic change and a large variety of shocks to which the Polish economy was exposed during the sample period. On the other hand it needs to be acknowledged that identification of long and short run relationships should be easier in a less complex economy. Even by the late 1990s the Polish financial system remained relatively underdeveloped compared to the system in advanced market economies.

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