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HAS VELOCITY IN AFGHANISTAN BEEN CONSTANT?

by

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This paper examines the relationship between money, income and prices in Afghanistan over the past two decades. The objective is to provide some indication from time series data of the behaviour of velocity of circulation. With this, a basis for calculating the optimum rate of monetary expansion over the period of the Fourth Five-Year Plan is provided. Without it, calculations can only be based on rule of thumb guidelines. In addition, such information provides a measure of the extent to which financial development has occurred in Afghanistan over this period.

The ultimate aim of money supply regulation is the maintenance of stable prices, full employment and an economic climate conducive to development. It is therefore essential for the effective implementation of monetary policy that the relationship between the money supply and the level of Gross National Product (GNP) at current prices be estimated. With estimates of the rate of growth in real terms, optimum monetary expansion can then be calculated. Control of the money supply has been discussed in detail elsewhere [10].

Economic statistics in Afghanistan are unfortunately either non-existent or unreliable; economic planning is thereby seriously jeopardised. This paper, therefore, briefly examines money, income, price and foreign exchange rate statistics, the important variables in velocity determination.

In an attempt at a preliminary assessment of their relative accuracy in relation to one another.

Section II presents a simple model of demand for money and velocity, introducing the critical variables to be used in empirical estimation. The data are then examined in Section III and velocity calculations presented. The implications of these estimates are discussed in the concluding section, the two aspects given particular attention being an assessment of financial development over the past two decades and an optimal money supply policy for the Fourth Plan period.

The paper is thus concerned with two related problems: the first is that of measuring velocity of circulation and the major variables which determine it; the second concerns the extent to which reliable conclusions can be drawn from the use of the data in a simple economic model. In particular, some attention is given to the practical problem of optimum monetary expansion over the period of Afghanistan's Fourth Five-Year Plan, 1351 - 1355.

Velocity of circulation is customarily measured by dividing a country's

Gross National Product (GNP) by the money stock. The figure so obtained

is designed to indicate how many times, on average, money circulates

during the course of a year for the purchase of final goods and services,

i.e. for those transactions constituting GNP.

In an economy like Afghanistan's, a large proportion of GNP consists

of goods and services for which money transactions are not made, e.g. agri-

cultural products consumed by those who grow them, the value of owner-

occupied housing, etc. Provided that the proportion of such items, for

which imputed values are given when GNP estimates are derived, in the

total GNP remains constant over time, measured velocity will, *ceteris*

paribus, remain constant. On the other hand, if the process commonly

known as monetisation is taking place in the economy an increasing proportion

of GNP will take the form of goods and services for which money payments

are made. This process can be expected to occur in underdeveloped

economies as they develop: farming gradually switches from subsistence to

commercial agriculture, urbanisation increases and modern sectors of the

Money is defined throughout to include currency in circulation plus private demand and time deposits excluding inter-bank deposits. This is the broad definition of money usually denoted M2.

economy expand. Under such circumstances, measured velocity will, paribus, decline. A numerical example may be useful in illustrating why this is so.

In the base year, it is assumed that GNP is composed of \$100m of final goods and services for which money transactions are made and \$100m of final goods and services for which there are no such transactions. Thus, 50 per cent of GNP is imputed. If it is further assumed that the money stock averaged \$40m over the year, the velocity of circulation can be calculated as 5. The \$40m has in fact been used to purchase only \$100m of final goods and services over the year and has therefore only circulated on average $2\frac{1}{2}$ times for the payment of such items.

Assuming everything else remains unchanged, e.g. the proportion of imputed value in GNP, institutional payments arrangements, per capita income, expected rates of inflation and interest, tastes and preferences, etc., a GNP in the following year of \$400m would only be possible if the money supply averaged \$80m over the year. Velocity would again be measured as 5. However, had the composition of the \$400m GNP not remained the same, but consisted of \$300m of final goods and services for which money payments were made and \$100m for which no money transactions took place, the money needed to finance the \$300m component would be \$120m on the original assumption that money circulates on average $2\frac{1}{2}$ times a year for the purchase of final goods and services. Calculated velocity now falls to 3.33.

Another reason for expecting velocity to fall as development takes place is that the income-elasticity of demand for money is greater than one. In other words, as real per capita income increases, the demand for money increases more than proportionately. For example,

$$\left(\frac{M}{P}\right) = a \left(\frac{Y}{P}\right)^b \quad (1)$$

where b is the elasticity of demand, a is a constant, $\left(\frac{M}{P}\right)$ is demand for money in real terms and $\left(\frac{Y}{P}\right)$ is real income. With $a = 0.001$ and $b = 2$, an increase in real per capita income from \$200 to \$400 will increase real demand for money from \$40 to \$160. If, in the previous example the increase in GNP from \$200m to \$400m doubled per capita income, i.e. assuming no population growth, calculated velocity would ceteris paribus fall from 5 to $2\frac{1}{2}$.

From the above, it is evident that a relationship between velocity and demand for money exists. The higher demand for money at a given level of income, the lower velocity. The mathematical relationship can be shown in the simplest version of the quantity theory -

$$M^d = qY \quad (2)$$

$$M^d = \frac{S}{N} \quad (3)$$

$$M^s = \bar{M} \quad (4)$$

where equation (2) shows demand for money (M^d) as a function of the level

rate of inflation. If a , b and c are known, a unique velocity consistent with the expected rate of inflation, R , the expected nominal interest rate and E , the expected capital real income and $(R - E)$ is the real rate of interest composed of in which $(\frac{p}{M})$ is per capita demand for real money balances, $(\frac{p}{Y})$ is per

$$(6) \quad \left(\frac{p}{M}\right) = a \left(\frac{p}{Y}\right)^b (R - E)^c$$

now be followed. The demand for money function chosen takes the form examining the demand for money function and it is this approach which will it has been shown that it is possible to analyze velocity by

does exist.

example given above, however, illustrates the point that a relationship the demand for money and money-income multiplier, i.e. velocity. The More complex models will produce more complex relationships between

where b is velocity and equals $\frac{1}{q}$.

$$(5) \quad Y = bM$$

equation for this model can be derived -

vice versa. By solving these equations simultaneously the reduced form in the money supply must always be accompanied by changes in income and supply of money is exogenously determined. In this simple model, changes demand (M^d) equals supply (M^s) and equation (4) signifies that the of income (Y) , equation (3) is the market equilibrium assumption that

with given values for any three of the four variables $(\frac{M}{P})$, $(\frac{Y}{P})$, R and E can be derived.

A priori, it can generally be assumed that $0 < a < 1$, $b > 1$ and $c < 0$.

Three predictions can be based on these assumptions, namely, that a rise in per capita income will cause a fall in velocity, a rise in expected nominal interest will also reduce velocity and a rise in the expected rate of inflation will conversely increase it.

Unfortunately, no time series for per capita income or interest rates in Afghanistan exist. For this reason, velocity estimates cannot directly be produced. Indirect estimates, however, can be derived using the few time series of macroeconomic data which are available. To these the paper now turns.

Income, Money, Prices and Interest Rates in Afghanistan

Economic data on Afghanistan are unreliable. A Central Statistics Office, however, was established in 1951 to remedy the situation. This will take some years. The scanty data which are available at present are shown in Table 1. The GNP figures formerly quoted by the World Bank are now considered so inaccurate that they are no longer reproduced in World Bank reports. The money stock series are thought to be more inaccurate for earlier years than for the 1940s. Nevertheless, since its predominant component is currency in circulation, a relatively easy statistic to measure, error is unlikely to be great. The price index is a composite spliced together from three different series used in Surveys of Progress [19; 20; 21; 22; 23; 24] and a revised series for the last three years produced by the Central Statistics Office as one of its first publications [3]. Its accuracy has been improved since 1940 but the revisions for the last three years by the Central Statistics Office suggest that even the data for the 1940s are rough. The exchange rate series, on the other hand, is accurate, the figures given being the averages of rates collected daily by Da Afghanistan Bank from the Kabul Money Bazaar. No interest rate data exist in any series. However, results of a recent survey suggest a significant upward movement over the past ten years [9]. In order of reliability, therefore, one can list exchange rate data first, followed by the money stock figures. The price data fall far down the scale as do the GNP estimates.

ECONOMIC STATISTICS FOR THE AFGHAN ECONOMY1329 - 1351

Date	Gross National Product (Afs. millions, current prices)	Money Stock (Afs. millions)	Consumer Price Index	Free Market Dollar Exchange Rate
1329			75.8	39.0
1330			76.8	35.0
1331		1,274	75.8	37.0
1332	13,000	1,339	74.8	37.7
1333		1,593	70.3	42.1
1334		2,097	79.4	45.2
1335	21,000	2,473	84.2	53.8
1336		2,481	102.4	54.1
1337		2,389	93.3	54.7
1338		2,587	97.9	46.6
1339		2,728	106.7	40.8
1340		2,981	100.0	43.5
1341	28,104	3,565	98.1	52.8
1342	39,339	4,405	132.2	51.3
1343	47,888	5,393	156.1	63.6
1344	54,147	6,160	170.5	75.3
1345	60,934	6,355	214.1	76.4
1346	63,270	6,290	264.2	76.4
1347		6,538	208.3	74.8
1348		7,341	207.9	75.4
1349		8,181	264.6	84.8
1350		8,759	312.5	84.6
1351				79.5

Note: The money stock data are the averages of beginning and end of year figures thus providing a mid-year estimate. The consumer price index is a spliced index obtained from three series for 1329 - 1335, 1332 - 1340 and 1340 - 1350, respectively.

The free market dollar exchange is the average daily buying rate for drafts and cheques quoted by dealers in the Kabul money bazaar. This rate is normally referred to as the bazaar rate.

Source: Gross National Product - 1322 estimate from ECAFE and 1335 estimate by A. Paul both quoted in J. Sharier, Vicious Circles of Poverty (London: Oxford University Press, forthcoming), Table 4 - 4. 1341 - 1346 estimates from International Bank for Reconstruction and Development, Economic Development Program of Afghanistan (Washington, D.C.: International Bank for Reconstruction and Development, mimeo, January 1967), Statistical Appendix, Table 3.

Money Stock - 1331 - 1336 from Ministry of Planning, Surveys of Progress, 1958, 1959 and 1962 - 64 (Kabul: Ministry of Planning, 1958, 1959 and 1964), Table Money 7 - 30, Volume II; Table 47, p. 186, Volume IV; Table A - 7, p. 106, respectively. 1337 - 1350 estimates from International Financial Statistics, 26 (1), January 1973, pp. 40 - 41 and International Financial Statistics: 1971 Supplement, pp. 2 - 3.

Price Index - 1329 - 1335 from Ministry of Planning, Survey of Progress 1958, (Kabul: Ministry of Planning, 1958), Table 4, p. 5 of Money Section (Part III), Volume I. 1332 - 1340 from Ministry of Planning, Survey of Progress 1961 - 62 (Kabul: Ministry of Planning, 1963), Table 9, p. 78. 1340 - 1350 from Ministry of Planning, Surveys of Progress 1967 - 1968, 1968 - 1969, 1969 - 1970 and 1970 - 1971 (Kabul: Ministry of Planning, 1968, 1969, 1970 and 1971), Table S - 12, Table S - 13, Table S - 19 and Table S - 19 respectively, and Central Statistics Office, Revised National Price Indexes for Afghanistan for the Years 1348 - 1350 (Kabul: Central Statistics Office, mimeo, 1972).

Free Market Dollar Exchange Rate - Unpublished figures from the Research Department, Da Afghanistan Bank.

Given an expected relationship between money and GNP an attempt can be made to construct a series for the latter. Both Friedman and Duggar have suggested and tested such a procedure with good results [6; 4]. However, evidence on elasticity of the demand for money with respect to expected inflation in studies by Campbell and Perlin [2; 25], among others, suggests that considerably improved estimates could be obtained by including this variable. The same argument applies for income and interest rate elasticities. No data exist, however, for these variables to be directly included. Fortunately, the effects of rising per capita income, which can reasonably confidently be assumed to have occurred during the past two decades in Afghanistan, on velocity will be offset by the reported upward movement of interest rates. Income and interest elasticities of demand for money tend to be of the same order of magnitude with reverse signs [5; 25]. A 10 per cent increase in per capita income produces a 14 per cent increase in the demand for money. A 10 per cent increase in the rate of inflation causes a 4 per cent decrease in demand for money. The net effect of the combined changes in income and interest rates is a 10 per cent increase in the demand for money which, of course, results in a constant velocity. It will therefore be assumed that the combination of changes in the level of per capita income and changes in the rate of interest will, over the 20 year span under analysis, cancel one another and thus produce no overall effect on velocity. In fact, both per capita income and interest rates are assumed to have risen on average annually by 2.5 per cent with elasticities of 1.4 and -0.4, respectively.

Fortunately, there is a further independent indicator to support these somewhat heroic assumptions. A significant trend in velocity is usually accompanied by a trend in the same direction in currency/money ratios [12; 17]. Table 2 provides examples of this phenomenon for Iran, Pakistan and Turkey. In Afghanistan, the currency/money ratio in 1331 was 0.753 and in 1350, 0.760 as is shown in Table 3. This negligible increase in the ratio which has not exhibited any long-run trends would not normally be associated with any distinct trend in velocity.

It has already been suggested that the price index presented in Table 1 is unreliable. Further evidence can be brought forward to support this and to provide an alternative. First, work by Hansen indicated that the official price series overestimated the real increase in the price level [13]. Second, almost all underdeveloped countries have suffered exchange rate depreciations greater than that warranted by purchasing power parity adjustments [26]. Hence, it is unlikely that Afghanistan's exchange rate depreciated less than the rise in prices, as indicated by the figures in Table 1. Recent work by Gallot [11] shows that over relatively long periods the purchasing power parity theory is valid. Using it, the following relationship is found -

$$(\text{Relative Inflation in Afghanistan}) = \frac{ER^0_{\text{afs}/\$}}{ER^t_{\text{afs}/\$}} = 1$$

where $ER_{\text{afs}/\$}$ is the exchange rate in afghanis per dollar. The superscripts

TABLE 2**CURRENCY/ MONEY RATIOS AND VELOCITIES IN IRAN, PAKISTAN AND TURKEY****1962 - 1970**

Date	Iran		Pakistan		Turkey	
	C/M	V	C/A	V	C/M	V
1962	0.28	5.7	0.48	4.7	0.38	5.2
1963	0.27	5.1	0.45	4.4	0.37	5.4
1964	0.25	4.8	0.43	4.1	0.38	5.2
1965	0.24	4.7	0.40	4.0	0.36	4.7
1966	0.22	4.4	0.40	4.0	0.33	4.6
1967	0.21	4.2	0.37	3.9	0.32	4.3
1968	0.19	3.9	0.35	3.9	0.30	4.1
1969	0.18	3.8	0.35	3.8	0.27	4.0
1970	0.17	3.6	0.34	3.6	0.27	4.0

Note: Currency and money supply data are centred annual averages.

Source: Iran - Money supply data from Bank Markazi Iran Bulletin, 3 - 10, 1962 - 1971; G.N.P. data from Bank Markazi Iran, Annual Report and Balance Sheet, 1971 (Tehran: Bank Markazi Iran, 1971), Table 2, p. 116.

Pakistan - Money supply and G.N.P. data from Central Statistical Office, Government of Pakistan, Monthly Statistical Bulletin, 1962 - 1971.

Turkey - Money supply data from Turkiye Cumhuriyet Merkez Bankasi Aylık Bülteni, 1962 - 1971; G.N.P. data from State Institute of Statistics, National Income, Total Expenditure and Investment of Turkey, 1938, 1948 - 1970 (Ankara: State Institute of Statistics, 1971), Table 1, pp. 10 - 11.

CURRENCY/MONEY RATIOS**1331 - 1350**

Date	Currency in Circulation	Money Stock	Currency/Money Ratio
1331	959	1,274	0.753
1332	983	1,339	0.734
1333	1,091	1,593	0.685
1334	1,333	2,097	0.636
1335	1,617	2,473	0.654
1336	1,825	2,481	0.736
1337	1,830	2,389	0.766
1338	1,865	2,587	0.721
1339	2,018	2,728	0.740
1340	2,381	2,981	0.799
1341	2,883	3,565	0.809
1342	3,521	4,405	0.799
1343	4,303	5,393	0.798
1344	4,683	6,160	0.760
1345	4,634	6,355	0.729
1346	4,714	6,290	0.749
1347	5,021	6,538	0.768
1348	5,691	7,341	0.775
1349	6,338	8,181	0.775
1350	6,659	8,759	0.760
		Average	0.747

Source: Same as Table 1

denote the base year "o" and the current year "t". The relative inflation in Afghanistan is measured by the equation -

$$\frac{WPI_A^t}{WPI_{us}^t} = \frac{WPI_A^o}{WPI_{us}^o}$$

where WPI is the wholesale price index. Taking $WPI_A^o = 100$ it is possible to express the remaining unknown variable, WPI_A^t , as follows -

$$WPI_A^t = \frac{ER^t_{\text{afs/\$}}}{ER^o_{\text{afs/\$}}} \cdot \frac{WPI_A^o}{WPI_{us}^o} \cdot WPI_{us}^t$$

The U.S. wholesale price index and the free market dollar exchange rate are combined in this way to produce a purchasing power parity price index for Afghanistan which is given in Table 4.

The effect of changes in the money stock on the nominal level of GNP takes place with a lag. An exhaustive study on this lagged relationship for the Turkish economy indicated that the lag lay in the region of twelve months [7, pp. 103 - 67]. It also found changes in the rate of inflation to be a significant variable in this relationship, a result of the effect of inflation on demand for money and hence velocity.

Estimates of GNP at current prices have been made using the following relationship -

PURCHASING POWER PARITY PRICE INDEX FOR AFGHANISTAN1329 - 1351

Date	U.S. Wholesale Price Index	Free Market Dollar Exchange Rate	Purchasing Power Parity Price Index for Afghanistan
1329	86.5	39.0	77.6
1330	96.4	35.0	77.6
1331	93.7	37.0	79.7
1332	92.4	37.1	78.8
1333	92.6	42.1	89.6
1334	92.9	45.2	96.5
1335	95.9	53.8	118.6
1336	98.7	54.1	122.8
1337	100.1	54.7	125.9
1338	100.3	46.5	107.4
1339	100.4	40.8	94.2
1340	100.0	43.5	100.0
1341	100.3	52.8	121.7
1342	100.0	51.3	117.9
1343	100.2	63.6	146.5
1344	102.2	75.3	176.9
1345	105.6	76.4	185.5
1346	105.8	76.4	185.8
1347	108.4	74.8	186.4
1348	112.7	75.4	195.3
1349	116.8	84.8	227.7
1350	120.6	84.6	234.5
1351	126.0	73.5	230.3

Source: U.S. Wholesale Price Index - International Financial Statistics, 26 (1), January 1973, pp. 366 - 67 and International Financial Statistics: 1971 Supplement, pp. 278 - 79.

Free Market Dollar Exchange Rate - Unpublished figures from the Research Department, Da Afghanistan Bank.

The GNP estimates produced when $b = 0.05$ will be referred to as Estimate A, the estimates produced when $b = 0.10$ Estimate B, etc. There is considerable evidence to suggest that as the rate of inflation increases the response in terms of the inflation elasticity of demand for money also increases. It might therefore be expected that the best monetary estimates for the period of low or negative expected rates of inflation would be

growth rates derived from these estimates are presented in Table 8. has been deflated by the purchasing power parity price index. Real more useful. These are given in Table 7 in which GNP in current prices appear in Table 6. For most purposes, estimates in constant prices are equation (7). Therefore, four alternative values were used. The results There was little basis for deciding what value to give b in

provided in Table 5.

I_{t-2} inflation in year $t-2$. The results of these calculations are parity price index in year t , I_{t-1} the rate of inflation in year $t-1$ and where I_t is the actual rate of inflation taken from the purchasing power

$$I_t^* = 0.46 I_t + 0.34 I_{t-1} + 0.20 I_{t-2} \quad (8)$$

in turn has been calculated from the following equation - where I_t^* is the expected rate of inflation in the current year. This

$$GNP_t = 10 M_{t-1} (1 + b I_t^*) \quad (7)$$

TABLE 5

EXPECTED INFLATION

1332 - 1351

DATE	EXPECTED INFLATION
1332	3.4016
1333	6.4644
1334	7.9774
1335	15.8940
1336	13.9544
1337	6.9428
1338	-5.1926
1339	-10.1440
1340	-4.2830
1341	9.6184
1342	7.1748
1343	14.4388
1344	17.1694
1345	14.1426
1346	5.8760
1347	1.1736
1348	2.3350
1349	9.3172
1350	7.9700
1351	3.5112
Average 1332-51	6.0871

TABLE 6

ALTERNATIVE ESTIMATES OF GROSS NATIONAL PRODUCT

$$\text{GNP}_t = 10M_{t-1} (1 + b1^*)$$

1332 - 1351

(Afs millions, current prices)

Date	b = 0.05	b = 0.10	b = 0.25	b = 0.50	b = 1.00
1332	12,743	12,745	12,753	12,766	12,791
1333	13,433	13,477	13,606	13,823	14,256
1334	15,994	16,057	16,248	16,565	17,201
1335	21,137	21,303	21,803	22,636	24,303
1336	24,865	25,001	25,407	26,085	27,439
1337	24,896	24,982	25,241	25,671	26,533
1338	23,828	23,766	23,580	23,270	22,649
1339	25,739	25,608	25,214	24,558	23,246
1340	27,222	27,163	26,988	26,696	26,112
1341	29,953	30,097	30,527	31,244	32,677
1342	35,778	35,906	36,289	36,929	38,208
1343	44,368	44,686	45,640	47,230	50,410
1344	54,393	54,856	56,245	58,560	63,189
1345	62,036	62,471	63,778	65,956	70,312
1346	63,737	63,923	64,484	65,417	67,284
1347	62,937	62,974	63,085	63,269	63,638
1348	65,456	65,533	65,762	66,143	66,907
1349	73,752	74,094	75,120	76,830	80,250
1350	82,136	82,462	83,440	85,070	88,330
1351	87,744	87,898	88,359	89,128	90,665

TABLE 7ESTIMATES OF GROSS NATIONAL PRODUCT AT 1340 PRICES1332 - 1351

(Afs Millions, constant prices)

Date	b = 0.05	b = 0.10	b = 0.25	b = 0.50	b = 1.00
1332	16,171	16,174	16,184	16,201	16,232
1333	14,992	15,041	15,185	15,427	15,911
1334	16,574	16,639	16,837	17,166	17,825
1335	17,822	17,962	18,384	19,086	20,492
1336	20,248	20,359	20,690	21,242	22,344
1337	19,774	19,843	20,048	20,390	21,075
1338	22,186	22,128	21,955	21,667	21,088
1339	27,328	27,185	26,766	26,070	24,677
1340	27,222	27,163	26,988	26,696	26,112
1341	24,612	24,730	25,084	25,673	26,850
1342	30,346	30,455	30,779	31,322	32,407
1343	30,285	30,502	31,154	32,239	34,410
1344	30,748	31,010	31,795	33,103	35,720
1345	33,443	33,677	34,382	35,556	37,904
1346	34,304	34,404	34,706	35,208	36,213
1347	33,764	33,784	33,844	33,943	34,141
1348	33,516	33,555	33,672	33,867	34,259
1349	32,390	32,540	32,991	33,742	35,244
1350	35,026	35,165	35,582	36,277	37,667
1351	38,100	38,168	38,367	38,701	39,368

TABLE 8ESTIMATES OF REAL GROWTH RATES IN GROSS NATIONAL PRODUCT1333 - 1351

Date	b = 0.05	b = 0.10	b = 0.25	b = 0.50	b = 1.00
1333	-7.29	-7.01	-6.17	-4.78	-1.98
1334	10.55	10.62	10.88	11.27	12.03
1335	7.53	7.95	9.19	11.18	14.96
1336	13.61	13.34	12.54	11.30	9.04
1337	-2.34	-2.54	-3.10	-4.01	-5.68
1338	12.20	11.52	9.51	6.26	0.06
1339	23.18	22.85	21.91	20.32	17.02
1340	-0.39	-0.08	0.83	2.40	5.82
1341	-9.59	-8.96	-7.06	-3.83	2.83
1342	23.30	23.15	22.70	22.00	20.70
1343	-0.20	0.15	1.22	2.93	6.18
1344	1.53	1.67	2.06	2.68	3.81
1345	8.76	8.60	8.14	7.41	6.11
1346	2.57	2.16	0.94	-0.98	-4.46
1347	-1.58	-1.80	-2.48	-3.59	-5.72
1348	-0.74	-0.68	-0.51	-0.22	0.35
1349	-3.36	-3.02	-2.02	-0.37	2.88
1350	8.14	8.07	7.85	7.51	6.87
1351	8.78	8.54	7.83	6.68	4.52

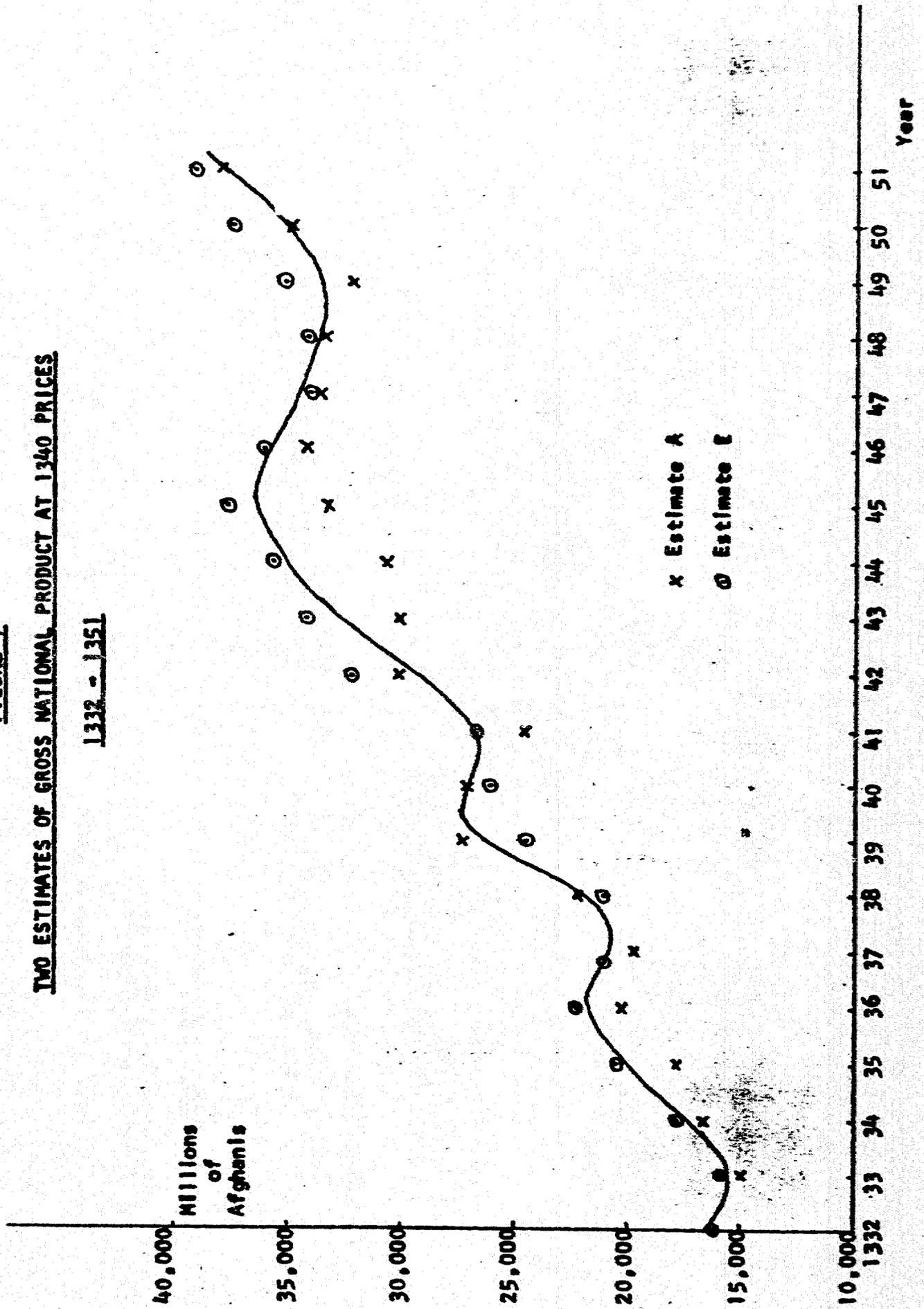
Estimate A and the best during periods of rapid inflation Estimate E. On this assumption, Estimates A and E have been plotted in Figure 1. The curve which has been fitted approximates Estimate A during low inflation periods and Estimate E during years of high expected rates of inflation.

There are two simple methods of assessing the validity of the monetary GNP estimates. Both are approximate in the extreme but nevertheless can allow a modicum of confidence to be placed in the monetary estimates where they indicate a reasonable degree of positive correlation. The first method uses the impressionistic assessments of the rate of economic growth by foreign experts visiting Afghanistan on regular missions. The second is based on recent work on fluctuations in currency/money ratios over the business cycle.

Regular visits of foreign experts to Afghanistan have taken place since 1335; the first pronouncements on economic growth were apparently made in 1341. In that year, the conclusion was reached that there had not been such growth over the past six years. Given the absence of statistics, six years is a long time span over which to draw comparisons. One would in fact expect such an assessment to be biased towards greater emphasis on the nearer events and less emphasis on developments occurring in the earlier part of the period. On this assumption, the monetary estimates are confirmed. Real growth was significantly negative in 1341 and stagnant in 1340. Over the entire period, however, the monetary estimates indicate

FIGURE 1
TWO ESTIMATES OF GROSS NATIONAL PRODUCT AT 1940 PRICES

1332 - 1351



an average annual growth rate of 5 per cent. The stagnation reported by the IMF Mission was attributed to excessive levels of deficit finance. Using data from International Financial Statistics 15, pp. 2 - 3; 16, pp. 40 - 417, it would appear that this phenomenon occurred only in the last three years of this period and was considerable only by 1341. This again supports the monetary estimates if deficit finance did in fact retard growth.

At the time, the fiscal and foreign exchange reforms at the beginning of 1342 were thought to have stimulated agricultural production and raised the rate of growth. The monetary estimates indicate rapid growth during this year. The deterioration in economic conditions reported in the following year, attributed to the increase in inflationary pressures, is again indicated by Estimate A. Improvement reported in 1344 is also consistent with the monetary estimates.

A recession from the latter part of 1345 to 1347 was reported by a mission in 1348. It has already been suggested that Estimate E should be used for this period of rapid inflation and it indeed indicates this downward movement in real GNP. The pick-up reported in the latter part of 1347 is also confirmed by these estimates.

In conclusion, fluctuations in the rate of growth during the 1340s reported by teams of foreign experts have all been forecast by the monetary

estimates, thus providing considerable support to their validity.

The second method is based on recent evidence on the cyclical behaviour of the currency/money ratio provided by Hess:

In the early part of a business expansion income rises, increasing the demand for demand deposits. However, since currency is related to consumption expenditures which in turn are dependent on permanent income, and permanent income has a muted response to changes in measured income, the demand for currency rises little if at all. Hence, the currency ratio initially falls. As the expansion proceeds, the demand for currency starts to rise faster than the demand for demand deposits in response to the earlier increases in income. This is because the cumulative response of currency to consumption is larger than that of demand deposits to income. Coupled with this is the delayed response of demand deposits to interest rates, which further depresses the demand for demand deposits relative to currency. Hence, midway through the expansion the lagged responses take effect and currency rises relative to demand deposits. This is reinforced as economic activity moves past its peak. After the peak, the demand for currency falls less than for demand deposits, causing the currency ratio to continue to rise. However, as during the expansion, the delayed responses of currency to consumption and consumption to income and demand deposits to interest rates results in an eventual fall in the relative demand for currency. The currency ratio starts to fall midway through the contraction which continues past the trough when the cyclical process repeats itself. In summary, the cyclical pattern of the currency ratio is effectively explained in terms of the cyclical pattern of the ratio of consumption to income in conjunction with interest-induced changes in the velocity of demand deposits.

[14, p. 673]

From the currency/money ratios for the period 1331 - 1350 given in Table 3, business cycle upwings should have occurred in 1335 and 1345 and

downswings in 1341 and 1349. From Figure 1, it can be seen that the expected movements in GNP at constant prices have taken place in these years according to the monetary estimates.

Later work will attempt to refine both the monetary estimates and the methods of assessment. The monetary estimates should be adjusted particularly for fluctuations in agricultural output. Clearly, the forecast growth in 1350 is erroneous because no account was taken of the serious droughts in 1349 and 1350. Further checks can be provided by detailed comparison with other significant economic indicators such as electricity consumption, production data and crop estimates. However, error in all these data will considerably detract from the usefulness of such checks.

So far, the monetary estimates have been tested for their ability to forecast short-run fluctuations in the level of economic activity. Apart from the evident inability to forecast those fluctuations caused by climatic variance, the estimates apparently scored well on the two tests administered. To assess the accuracy of long-run trends, however, different tests are required.

The long-run correlation between velocity and currency/money ratios has already been mentioned. Velocities calculated by dividing Estimate C GNP at current prices by the money stock are presented in Table 9 and Figure 2. The absence of any trend in velocity is supported by the absence

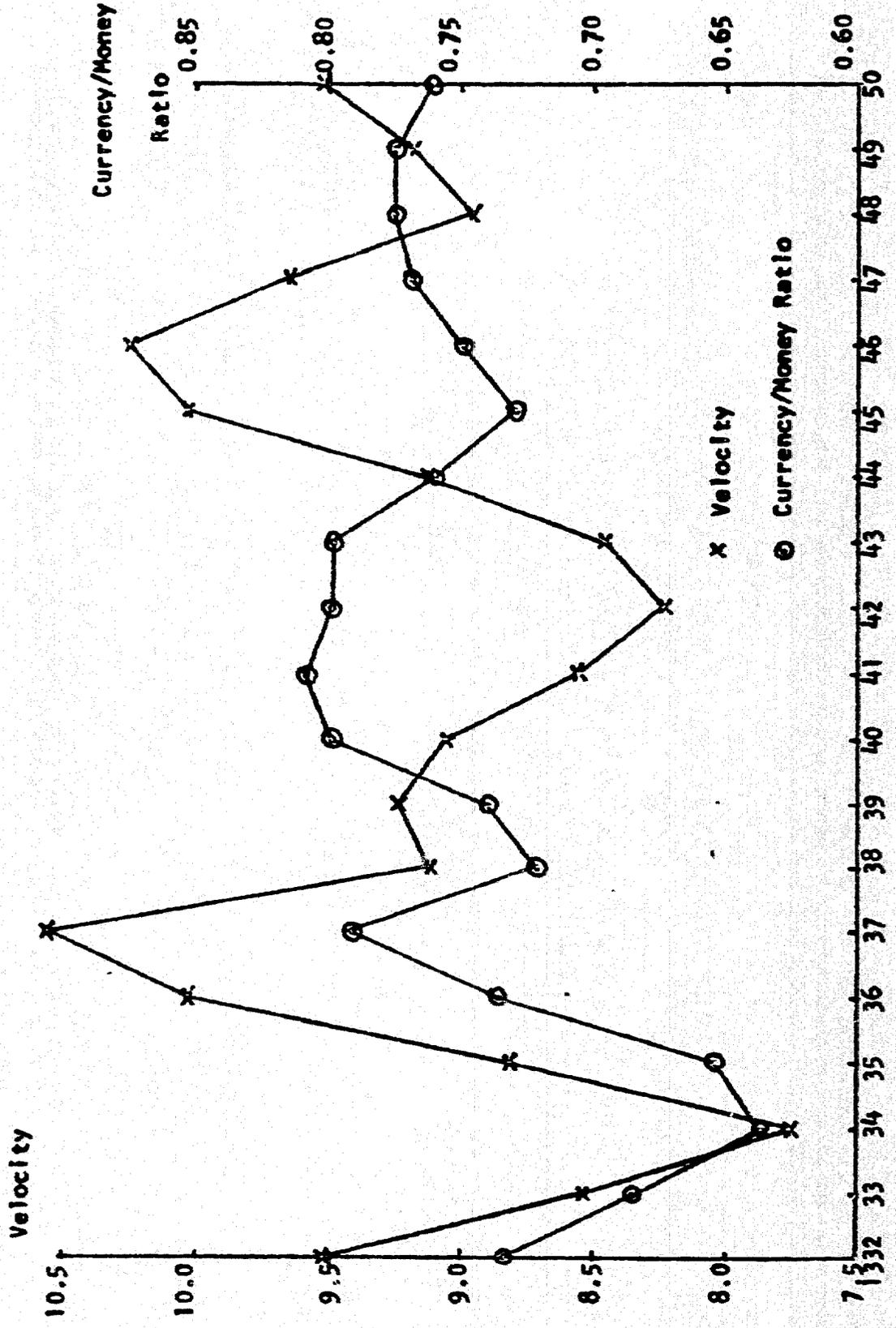
TABLE 9

VELOCITY AND CURRENCY/MONEY RATIOS

1332 - 1350

Date	Velocity Based on Estimate C	Currency/Money Ratio
1332	9.524	0.734
1333	8.541	0.685
1334	7.748	0.636
1335	8.816	0.654
1336	10.241	0.736
1337	10.566	0.766
1338	9.115	0.721
1339	9.243	0.740
1340	9.053	0.799
1341	8.563	0.809
1342	8.238	0.799
1343	8.463	0.798
1344	9.131	0.760
1345	10.036	0.729
1346	10.252	0.749
1347	9.649	0.768
1348	8.958	0.775
1349	9.182	0.775
1350	9.526	0.760
Average	9.202	0.747

FIGURE 2
VELOCITY AND CURRENCY/MONEY RATIOS
1332 - 1350



of any trend in the currency/money ratio.

If it is therefore accepted that no trend has occurred in velocity then the average annual increase in GNP at current prices over the period 1332 - 1351 has been 10.2 per cent. The reliability of this figure is supported by the fact that the monetary estimates at current prices do agree with the selection of independent estimates presented in Table 1. Using the purchasing power parity price index, GNP at constant prices has increased at an average annual rate of 4.5 per cent. If population has been expanding at an average annual rate of 2 per cent, per capita real income has thus been growing by an average annual rate of 2.5 per cent. In the light of a recent survey [9] supported by the impressions of several other observers, a growth rate of this magnitude should not automatically be rejected. It does, however, sharply contradict accepted beliefs on economic stagnation in Afghanistan (e.g. [1]).

The estimates of GNP presented above have implicitly assumed a constant proportion of imputed income in the total. Although Afghan agriculture is highly dependent on annual precipitation the inelasticity of demand for agricultural products results in higher incomes in current prices within this sector during years of poor production than during years of good harvest. On the assumption that price changes approximately cancel changes in quantity, it has been decided not to attempt any further adjustments to the GNP series produced. Furthermore, the inaccuracy of estimates of crop production

introduces errors into the estimates which the monetary estimates were designed to eliminate.

iv Conclusion

Taking a 4.4 per cent growth in GNP at constant prices as the basic objective of the Fourth Plan, the maximum non-inflationary monetary expansion on the basis of past experience is also an annual figure of 4.4 per cent, assuming no change in official foreign exchange holdings. Thus, the optimum expansion in domestic credit, which with the necessary simplifying assumptions equals the increase in the money stock, would be about Afs 2.486m. This represents less than 10 per cent of the total planned investment outlay. It has been shown elsewhere that a programme of active financial development might enable over half of this investment to be financed from non-inflationary domestic credit expansion [87]. This is just one illustration of the potential of financial development.

The material presented in the previous section suggests in various ways, all of which reinforce one another, that there has been no significant decline in the velocity of circulation over the past two decades in Afghanistan. The significance of this lies in the fact that velocity can be used to measure financial development. The latter is the most important determinant of economic growth [8; 187].

The inverse of velocity measures the proportion of income held on average in the form of money. Thus, any decrease in velocity is an increase in this proportion, i.e. is an increase in the demand for money per unit of

Income. In a country like Afghanistan, where money is the only important financial claim, an increase in the demand for money per unit of income increases financial savings and results in a relative expansion of the financial sector which provides such financial claims. The importance of this expansion for mobilising savings into productive investment has been taken up in some detail elsewhere [10].

The causal links between financial development and economic growth are twofold: first, an increase in savings is a concomitant of financial development; second, a higher proportion of savings is held in financial form. In turn, these have two effects on investment: first, investment increases; second, its productivity rises. The increase in savings occurring with financial development frees additional resources for investment. The increase in the proportion of savings held in financial form means that a greater portion of that savings can be allocated to the most productive investment opportunities by the financial system. Since the real interest rate is the critical variable in financial development, a positive relationship exists between it and both the quantity and quality of investment. Hence, it is concluded that Afghanistan possesses enormous growth potential from a positive policy of financial development which took the real rate of interest as the key variable. This again has been considered in some detail elsewhere [10].

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