
Rates of Return on Stocks, T-Bills, and Deposits in the Philippines, 1987 - 1992

By Roy C. Ybañez

The study provides estimates of after-tax rates of return of treasury bills, common stocks, and bank deposits over the 68-month period from November 1986 to June 1992. This period is noteworthy in the history of Philippine financial markets: it was a period of deregulated interest rates, and was characterized by episodes of stability and instability. Financial returns generally displayed the high risk-high return pattern expected of competitive financial markets. Common stocks provided the highest after-tax rates of return and risk in Philippine financial markets, followed by treasury bills, peso time deposits, dollar time deposits, and savings deposits. In general, investors enjoyed positive real rates of return.

INTRODUCTION

What rates of return do financial assets in the Philippines provide? This question is foremost in the minds of investors, portfolio managers, security analysts, researchers and teachers. This paper provides initial answers to this and related questions about investing in Philippine financial markets.

The study covers treasury bills, common stocks, and bank deposits which constitute the major investment instruments in Philippine financial markets. Promissory notes, though a significant market, are excluded due to data limitations [1]. Commercial papers and treasury notes are likewise excluded (aside from being fairly small though growing markets; see Table 1).

The study is limited to the 68-month period from November 1986 to June 1992. There are several notable characteristics about this period: a) the new democratic government which replaced the 20-year old regime was committed to removing government's presence in key economic sectors; b) significant financial liberalization had been achieved, particularly the deregulation of interest rates;

and c) a comprehensive economic program was substantially in place, which set the framework for long-term growth and the management of the foreign debt problem.

In general, it was a period of economic and political liberalization: But it was also a period which experienced a series of serious destabilizing political and economic events such as the seven coup attempts, the pullout of the US bases, the Middle East war, and natural calamities in major producing areas. A peaceful transition to a new government capped our period of study.

Hence, the rates of return presented in the study are particularly significant in that they record the performance of financial assets in a relatively unrestrained market, in a period which experienced both economic growth and decline, and episodes of stability and instability.

THE DATA SERIES

The study presents monthly returns of the various asset classes. The calculation procedures are adopted from Ibbotson and Sinquefeld's classic work on rates of return of financial assets in the U.S., **Stocks, Bonds, Bills and Inflation**, otherwise known as the SBBI series.

For each type of financial asset, monthly returns are computed as the percentage increase in the market value of the asset. The market value is reckoned at market rates/

Roy C. Ybañez is Associate Professor at the UP College of Business Administration. The author is grateful to Sun Hung Kai Securities for making available their stock market data.

**Table 1. Year-End Balances of Major Types of Financial Assets
(In million pesos)**

Year-End	Savings Deposits	Time Deposits	Deposit Substitutes	Treasury Bills	Commercial Papers	FCDU Deposits	Stocks
1986	62,620	34,160	10,961	55,420	2,898	17,019	41,214
1987	72,105	33,750	11,438	105,908	2,630	20,520	61,108
1988	92,253	43,950	9,619	142,615	1,733	28,461	88,591
1989	118,377	54,184	11,642	172,643	3,727	40,970	260,470
1990	159,193	49,102	9,984	192,589	6,782	61,615	161,219
1991	186,909	55,774	12,035	213,469	n.d.	82,964	297,743

- 1) Savings and time deposits are for deposit money banks (DMBs) only.
- 2) Deposit substitutes are for DMBs and non-bank financial institutions with quasi-banking licenses.
- 3) Commercial papers include both short-term and long-term CPs.
- 4) FCDU deposits are local deposit liabilities valued at year-end CB reference rate of Foreign Currency Deposit Units (FCDU) of local banks.
- 5) Stock market figures are market capitalization (Manila Stock Exchange).

Sources : Central Bank, Securities & Exchange Commission, 1990 Philippine Statistical Yearbook.

prices on the first Monday of the month. Market value is computed net of the applicable tax rate, but gross of transactions costs, e.g. broker and dealer fees/margins. Both nominal and real rates of return are presented. Real rates of return are derived by geometric subtraction (as distinguished from arithmetic subtraction) of the inflation rate from nominal rates [2]. Annual returns are computed by compounding monthly returns [3].

1. Common Stocks

Monthly returns are based on the composite and sectoral price indexes of stock transactions in the Manila Stock Exchange. The composite stock index currently consists of a diversified portfolio of 27 companies (out of 166 companies listed as of June 1992) accounting for about 40% of total stock market capitalization [4].

The monthly return is calculated as the percentage increase in the index, net of a 0.25 % transactions tax deducted from the end-of-month index value. Cash dividends are excluded from the monthly returns, mainly because of the difficulty of adjusting the indexes for such dividends. This results in some underestimation of stock returns, but is not expected to materially alter the ranking of returns among the asset types. Philippine corporations, at least those listed in the stock exchange, typically pay low cash yields ranging from 0% to 2% per year, which currently averages about 0.8%.

Returns are computed based on the closing values of the indexes on the first Monday of each month, or on the next available trading day when the first Monday falls on a holiday. The specific dates and number of calendar days for each month established by this procedure become the basis for the computation of monthly returns for the other asset types.

2. Treasury Bills

Returns on treasury bills are computed from the market prices for a notional T-Bill investment, e.g., ₱10,000, as of the dates established for stocks. Ideally, returns should be computed for a T-Bill having the shortest maturity not less than 30 days. However, the Central Bank issues 30-day T-Bills and Central Bank bills sporadically. Hence, the study chose the next available term consistently traded which is the 91-day treasury bill.

The study uses the weighted average interest rate (WAIR) of 91-day T-Bills established in the Central Bank weekly auction of treasury bills. Given a notional face value and the WAIR, prices are determined using standard treasury bill formulas, e.g. net of the 20% final tax. In effect, the T-Bill is priced at the beginning of the month and at the end of the month, on the same reference dates used for stocks. The T-Bills are priced using the 91-day WAIR of the CB Friday auction immediately preceding these calendar dates. Monthly return is the percentage change in the market price of the T-Bill.

Note that the 91-day rate is used to determine selling price of a T-Bill with more or less 60 days remaining tenor. The use of the CB WAIR disregards dealer spreads, consistent with the treatment of broker's fees in the case of stocks.

3. Bank Deposits and Inflation

Unlike stocks and treasury bills, published data on bank deposit rates and inflation rates are average rates for the month [5]. Hence, measured deposit returns and inflation rates lag stock and T-Bill returns by about one-half month. For peso time deposits, the 30-45 day rate was used. Savings deposits do not have specified tenors. Given a notional investment value, the maturity value of the bank deposit is determined, net of the 20% final tax on interest income, for the same calendar period as that of stocks and T-Bills. The monthly percentage return is correspondingly computed.

The interest income on dollar deposits in foreign currency deposit units (FCDU) is based on the monthly WAIR of 30-60 day time deposits. Overall returns include the gains and losses resulting from fluctuations in the peso-dollar exchange rate, based on the Bankers Association of the Philippines (BAP) monthly reference rate. Both interest income and foreign exchange gains are tax-free returns.

The inflation rate is simply the percentage increase in

the monthly Consumers Price Index (CPI), i.e., month-by-month increase rather than the year-on-year monthly inflation published by business dailies. This is to ensure that inflation rates are measured contemporaneously with asset returns. Following Ibbotson and Sinquefeld [1989], the CPI is chosen over other price indexes as it best reflects the inflation effects on the real value of investor portfolios.

THE RESULTS

1. Overall Results

Common stocks provide *ex-post* the highest after-tax rates of return in Philippine financial markets, followed by treasury bills, peso time deposits, dollar time deposits, and savings deposits (see Table 2).

Chart 1 shows graphically the growth of ₱10,000 invested in common stocks, treasury bills, and deposits over the period November 1986 to June 1992. The values are derived through continuous monthly reinvestment for each asset class at their respective after-tax rates. The chart shows that hypothetical investments of ₱10,000 made in each asset type at the beginning of November 1986 would have grown by the end of June 1992 to ₱34,157 for stocks, ₱21,622 for T-Bills, ₱19,334 for peso time deposits, ₱17,916 for dollar time deposits, and ₱12,629 for savings deposits.

Table 2. Summary Statistics of Rates of Return
(November 1986 - June 1992)

Series	Monthly			Annual ¹
	Arithmetic Mean	Standard Deviation	Geometric Mean	Arithmetic Mean
Common Stocks	2.59 %	12.69 %	1.82 %	42.5 %
Commercial-Industrial	2.44	10.96	1.83	43.1
Mining	1.03	13.34	0.22	19.5
Oil	4.68	21.54	2.80	68.3
Treasury Bills	1.14	0.55	1.14	14.8
Time Deposits	0.97	0.37	0.97	12.5
Savings Deposits	0.34	0.11	0.34	4.4
Dollar Deposits	0.87	1.38	0.86	10.4
Inflation	0.88	0.78	0.88	11.0

¹/ Since the sixth year has only eight months data (the series covers 68 months in all), the 8-month return was annualized for purposes of estimating mean annual return.

On the other hand, a basket of consumer goods valued at ₱10,000 in November 1986 would have a price tag of ₱18,093 by June 1992.

Common stocks have the highest variability of returns, as measured by the standard deviation of monthly returns. In contrast to stocks, fixed-rate debt instruments recorded minimal variability in returns. This is consistent with the principle that in competitive financial markets, high risk requires high returns (see Table 2). Charts 2 and 3 show the frequency distributions of returns. The height of bars is measured in number of months; the class interval is 2%.

Rates of return on treasury bills consistently outpaced the inflation rate and displayed far less variability compared to stocks. Considering that treasury bills are government guaranteed, and hence, have no default risk, treasury bills were virtually risk-free investments during this period for buy-and-hold investors. Investors pursuing trading strategies would, of course, face interest rate or price risk, and liquidity risk. For these investors, the recently established interest rate futures market now provides opportunities for managing interest rate risk, while many dealers now provide liquidity (even for "without recourse" transactions) through unwritten buy back arrangements.

Estimates of real rates of return, i.e., net of inflation, are shown in Table 3.

The real value of peso time deposits was higher by the end of the period but the gain in value has been realized only in the past year. Up until 1990, nominal returns on peso time deposits were just sufficient to maintain the real value of capital.

Savings deposits, dollar time deposits, and mining stocks were unable to keep pace with inflation.

2. Common Stocks

How much did investors receive for the added risk of investing in stocks? Total returns on equity may be viewed as being composed of a time premium (the risk-free time value of money) and an equity risk premium. The mean annual return on stocks is 42.5% while the mean T-Bill return is 14.8%. This suggests that the equity risk premium is about 28.4%, or nearly 200% of the risk-free rate.

About half the time (or 44%), monthly returns were negative, with the biggest monthly loss recorded at 28.6%. In real terms, our hypothetical stock portfolio was even experiencing a cumulative loss by September-October 1990 (mainly because of the fall in stock prices and the inflation induced by the Middle East crisis).

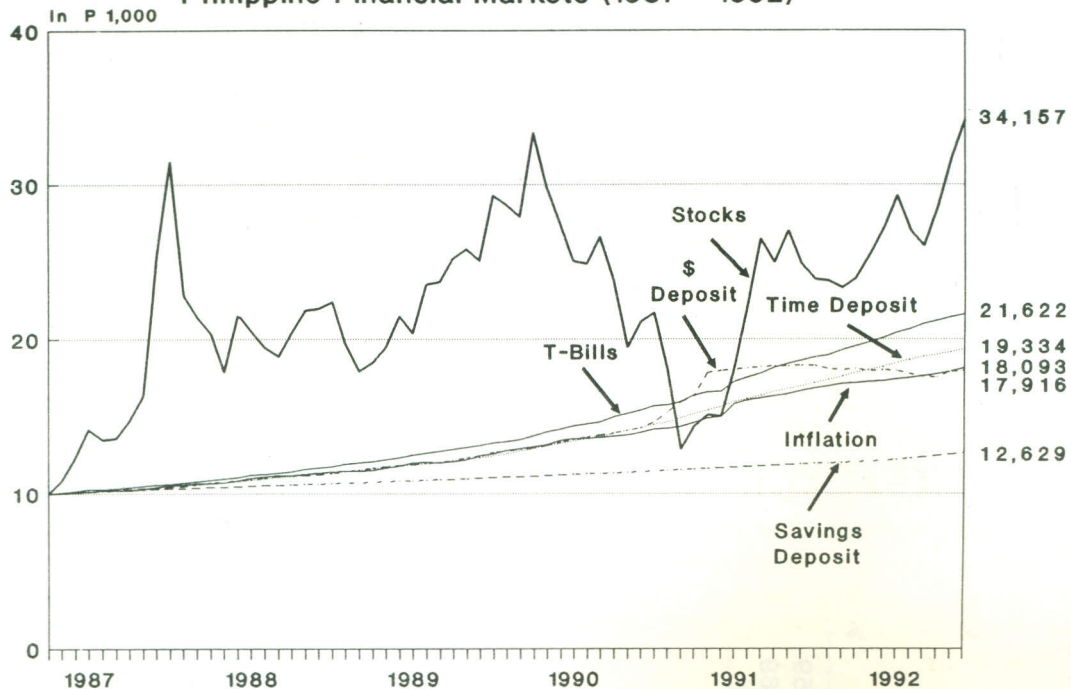
The risk described above applies to a relatively diversified portfolio of 27 stocks. We should, therefore, expect that

Table 3. Real Rates of Return (Inflation Adjusted)
(November 1986 - June 1992)

Series	M o n t h l y			Annual
	Arithmetic Mean	Standard Deviation	Geometric Mean	Arithmetic Mean
Common Stocks	1.68 %	12.42 %	0.94 %	28.6 %
Commercial-Industrial	1.53	10.68	0.95	28.6
Mining	0.15	13.18	(0.65)	8.9
Oil	3.76	21.28	1.90	53.4
Treasury Bills	0.26	0.62	0.26	3.5
Time Deposits	0.10	0.69	0.10	1.4
Savings Deposits	(0.52)	0.76	(0.53)	(5.8)
Dollar Deposits	0.00	1.44	(0.01)	(0.5)

Chart 1

Wealth Indexes of Investments in Philippine Financial Markets (1987 - 1992)



Wealth Indexes of Investments In Common Stocks (1987 - 1992)

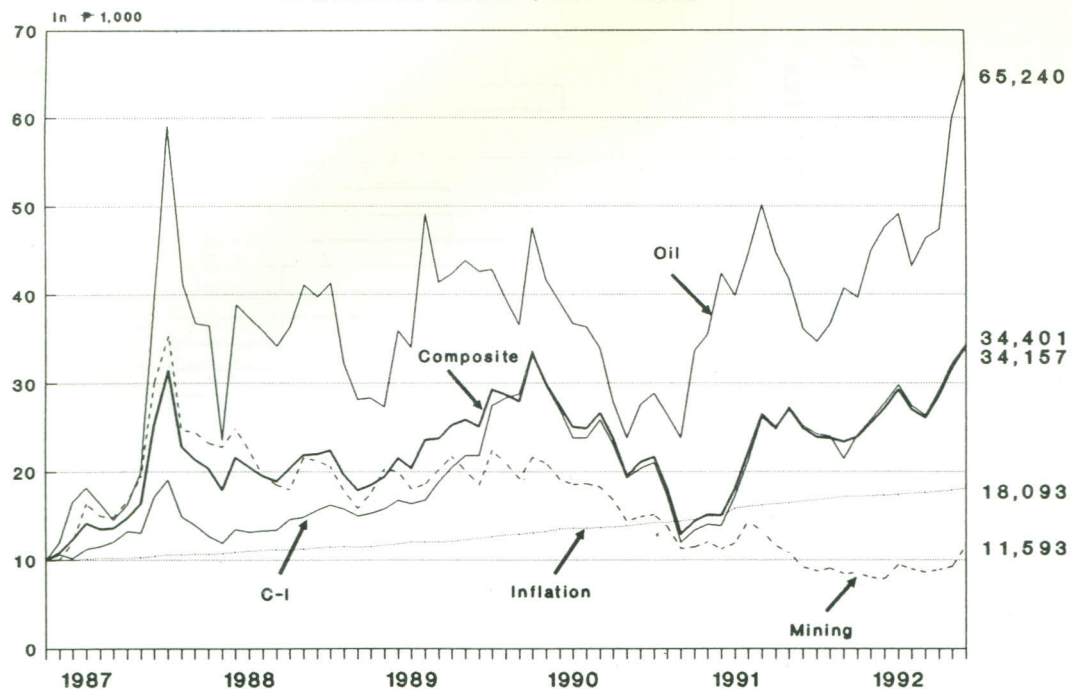


Chart 2

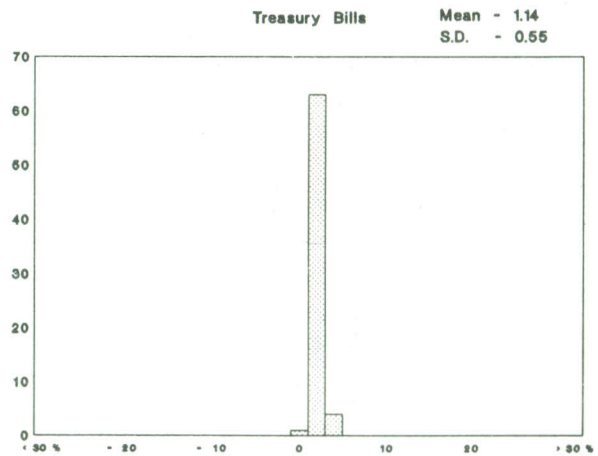
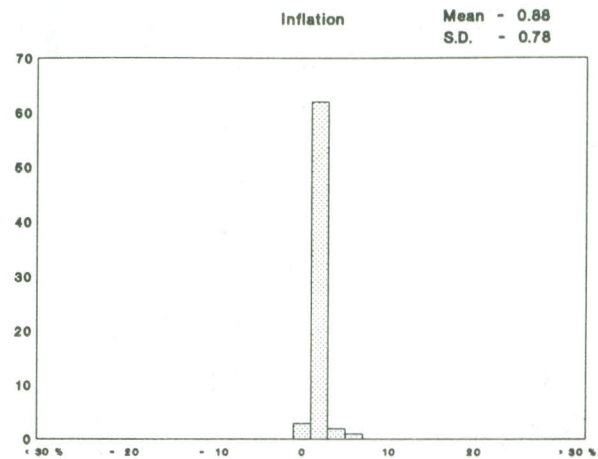
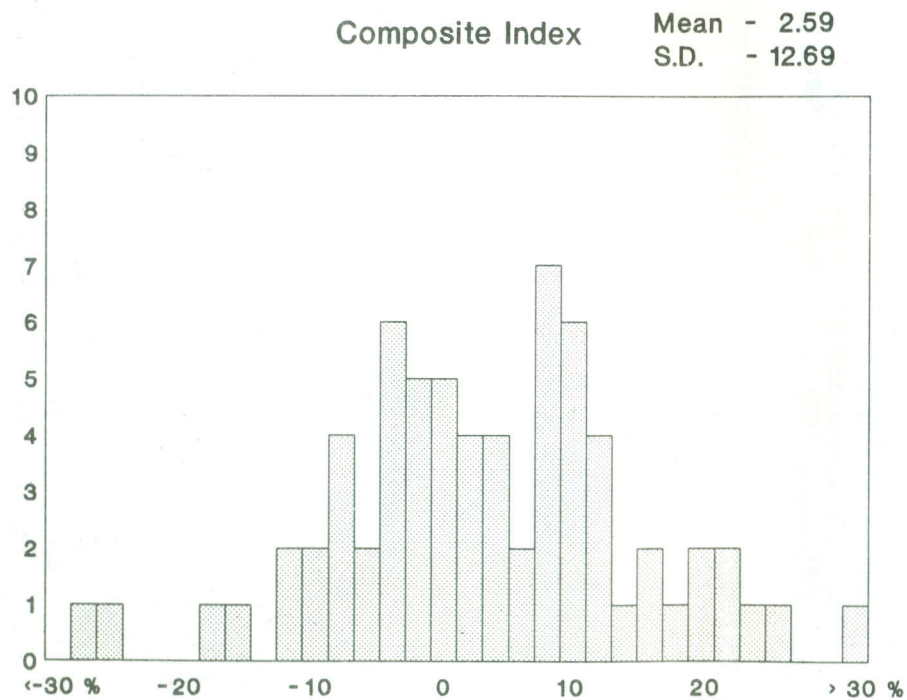
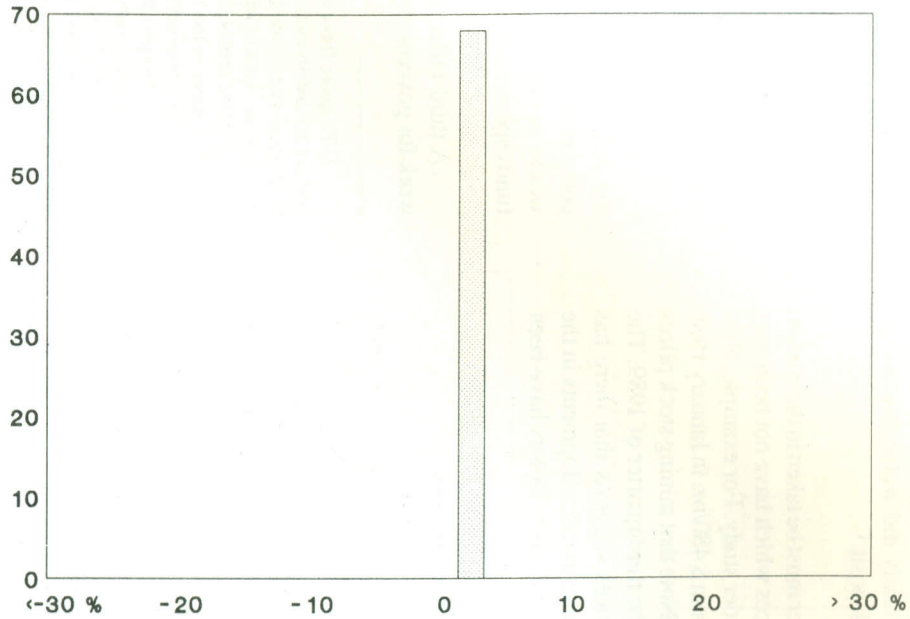


Chart 3

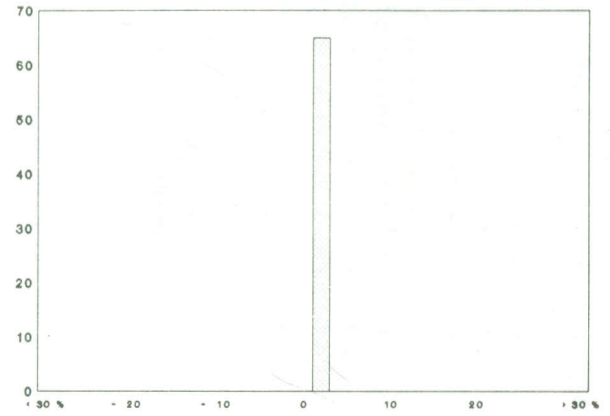
Time Deposits

Mean - 0.97
S.D. - 0.37



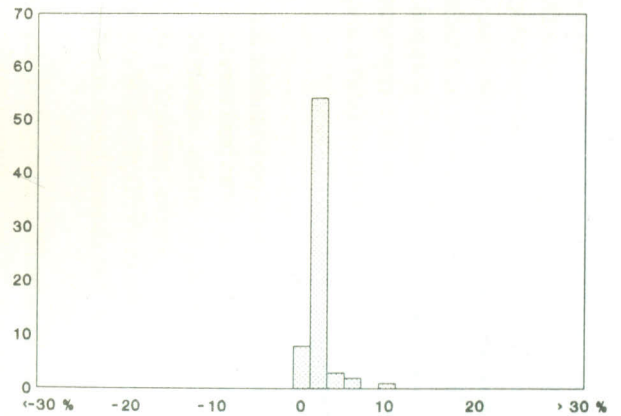
Savings Deposits

Mean - 0.34
S.D. - 0.11



Dollar Deposits

Mean - 0.87
S.D. - 1.38



there will be individual stocks and less diversified portfolios which will display higher risks and correspondingly higher returns. Such is the case with sectoral indexes which represent specific industries, and hence, do not constitute diversified portfolios. The stock market tracks two such sectors, mining and oil, whose indexes have 8 and 6 component stocks, respectively. A third sector (with 13 component stocks) is still largely diversified as it covers all other commercial and industrial firms.

The results show a mixed performance for stocks on a sectoral basis (Chart 4). Oil stocks paid very high returns but displayed correspondingly higher variability of returns. Commercial-industrial stocks yielded a slightly lower monthly return than the diversified portfolio represented by the composite index, but showed better stability in returns.

Mining stocks turned in a poor performance. Relative to other asset types, a portfolio of mining stocks was superior only to savings deposits in terms of mean return. However, for the period under study, a continuously reinvested (compounded) mining portfolio actually did worse than a continuously reinvested savings deposit.¹

The above finding however must be taken in the context of the state of world metal prices which have not been very favorable during the period under study. For example, New York gold has steadily fallen from \$ 480/oz. in January 1988 to \$342/oz. by end-June 1992. Note that mining stock prices have been on a decline since the third quarter of 1989. The protracted decline of stock prices suggests that there has been a continuous stream of negative developments in the mining industry, and that these negative factors have been largely unexpected.

3. Treasury Bills and Peso Time Deposits

Treasury bills offered highly competitive after-tax yields which were consistently higher than the inflation rate. In real terms, T-Bills had a mean monthly return of 0.26%, and a mean annual return of 3.5%. (By way of comparison, the real return on U.S. treasury bills was 1% in 1987, and 0.4% over 1926-1987). This is a reflection of the large supply of treasury bills which the government must regularly sell as a result of budgetary deficits and the generally tight money policy that characterized this period.

In fact, treasury bills pay more than time deposits. *A priori*, we would expect time deposits to earn a premium over treasury bills for at least two reasons:

- a) Time deposits should normally carry a premium for default risk over risk-free treasury bills. Though time deposits are covered by deposit insurance, the coverage has a maximum limit of ₱40,000 (recently increased to ₱100,000). At year-end 1990, the average account size of time deposits in commercial banks was ₱131,127, which clearly shows the inadequacy of insurance coverage against default risk. Furthermore, depositors face the prospect of a tedious process and unpredictable timing of payment in the event of a bank failure.
- b) The tax on treasury bills is collected up front while the tax on deposits is back-loaded.

There are a number of possible reasons for the lower yield on time deposits.² One is that investors are paying the cost of liquidity that time deposits provide. Banks routinely allow pretermination of certificates of time deposits. Due to the absence of a secondary market, T-Bill dealers will normally buy back or resell the investor's treasury bills only on a best efforts basis. Aside from the liquidity advantage, depositors do not face any price risk; although there is a substantial discount for pretermination of time deposits, the discount is preset and predictable. On the other hand, treasury bill holders face uncertainty as to the pretermination value which depends on the market rate prevailing at the time of pretermination.

A second possible reason is that small savers are paying the cost of the lower denominations of time deposits as compared to treasury bills. (An approximation of these costs would be the percentage fees collected by common trust funds specializing in treasury bills.)

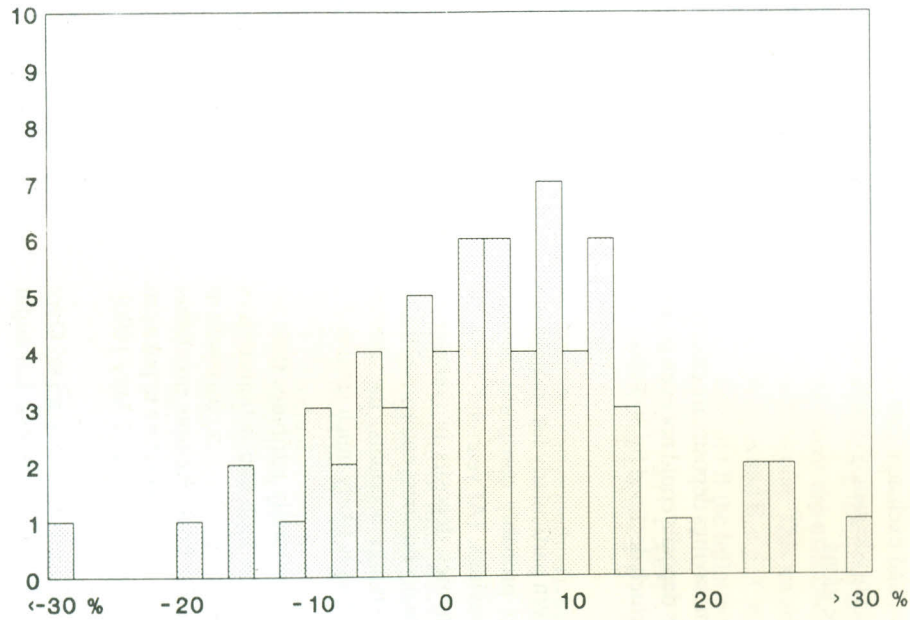
A third influence may be the limited distribution network for government securities. While the financial system

1/ To quote Ibbotson and Sinquefeld, "If returns are subject to a probability distribution, the arithmetic mean is the measure of prospective returns that accounts for uncertainty The arithmetic mean is the rate of return which, when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values The geometric mean is the best estimate of the future rate of growth of a continuously compounded investment."

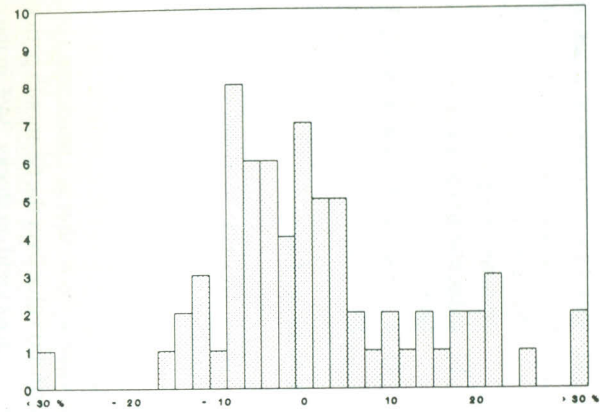
2/ It is also possible that the rate differential is a result of the exclusion of dealer spreads in the estimation procedure. On the other hand, the use of the 91-day rate in pricing a T-Bill with a remaining tenor of (generally) 60 days leads to some underestimation of the true holding period return. On the whole though, it is doubtful if these procedural factors can account for all of the annual rate differential of 2.3 percentage points (230 basis points) between the two asset types. Over the period, the mean spread in after-tax rates of 91-day and 182-day T-Bills was only 0.875 %.

Chart 4

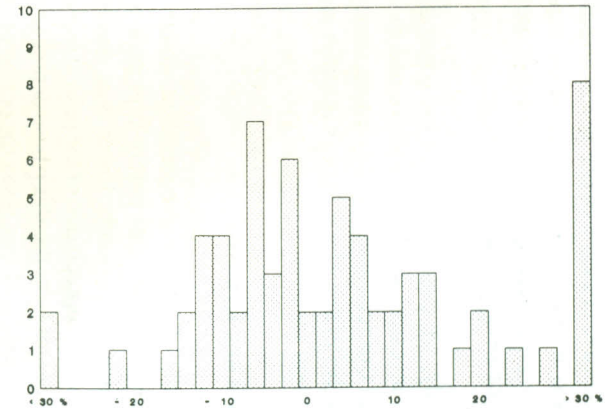
Commercial-Industrial Mean - 2.44
S.D. - 10.96



Mining Index Mean - 1.03
S.D. - 13.34



Oil Index Mean - 4.68
S.D. - 21.54



has an extensive branch network, not all branches are authorized to deal in treasury bills. In these areas, banks do not face competition from treasury bills, and hence are not pressured to offer competitive rates on deposits.

Finally, we cannot discount the possibility that many potential investors are simply uninformed about the relative features of financial assets. For example, some may have the erroneous belief that a bank deposit is a safer instrument than a government security.

4. Dollar Time Deposits

In terms of their peso equivalent, dollar deposits provided nominal yields that barely kept pace with inflation. Interest rates are typically lower than domestic inflation rates, while the appreciation of the peso in recent months has eroded the gains from the sharp peso depreciation during the Middle East crisis. Hence, over the period of study, a dollar deposit can be judged as an inferior investment alternative, notwithstanding its tax-free status - interest rates were low relative to peso instruments, and exchange rate fluctuation introduced risks which were not adequately compensated by long-term foreign exchange gains.

5. Savings Deposits

In terms of rate of return, savings deposits are clearly an inferior alternative. Savings deposits could not even protect the real value of savings, which declined by 30% over this period.

This is a cause for concern particularly for small savers for whom savings deposits probably constitute the only vehicle for their financial savings. (At year-end 1990, the average account size of savings deposits in commercial banks was ₱20,228. Since many business enterprises maintain liquidity balances in savings accounts, the average balance of individual depositors is likely much smaller.)

The banking community generally attributes their inability to offer higher rates to the high transactions cost of servicing small accounts, and intermediation costs such as the reserve requirement and the gross receipts tax. Other quarters note the possibility of a cartel operating to put a cap on the savings deposit rate [*Business World*, 2 May 1990].

Do small savers have anything to look forward to? Over the near term, there are some plausible scenarios that might move banks to offer higher deposit rates:

- a) increased competition from small savings alternatives such as common trust funds, mutual funds, and the recently announced small denomination government securities;
- b) reduction in transaction costs as a result of automation;
- c) a reduction by the Central Bank of regulation-induced costs.

6. A Note on Taxes

While the tax on fixed rate peso instruments is on interest income (at 20%), a transactions tax of 0.25% applies on stocks. A comparable measure of the effective tax rates may be derived by comparing terminal values of our hypothetical portfolios on a before- and after-tax basis. This procedure shows that as a percentage of the gross increase in portfolio value over the 68-month period, taxes take up 21% of the gross yield on stocks, 34% in the case of T-Bills, 27% for time deposits, and 22% for savings deposits. Returns on dollar holdings are tax-free.

Thus the results show that the transactions tax leads to the least tax burden, given the historical interest rate and stock price behavior, and a fairly active portfolio held with a long investment horizon. The tax on fixed rate instruments has a floor of 20%. Less frequent trading on stocks can substantially reduce taxes, even below 20%, but stock investors have to pay taxes even when gross yields are negative.

The effective tax rate on T-Bills and deposits exceed 20% of cumulative gross yield. This reflects the opportunity loss on early payment of taxes that result from frequent trading. This opportunity cost is of course a function of interest rates, which explains the relative tax take on deposits and T-Bills. In the latter case, the tax is front-loaded, further increasing the effective tax rate.

SUMMARY AND CONCLUSIONS

The study investigates the rates of return of financial assets over a period which has distinctive characteristics in the history of Philippine financial markets. The period 1987-1992 were years of deregulated interest rates and a liberalized business environment. This period is also notable for its cycles of economic growth and decline, and stability and instability.

The study finds that:

Financial returns generally displayed the high risk-

high return pattern expected of competitive financial markets. Common stocks provided the highest rates of return and risk in Philippine financial markets, followed by treasury bills, time deposits, and savings deposits.

- The key financial assets generated returns in excess of the inflation rate. In general, investors enjoyed positive real rates of return.
- Treasury bills, in particular, were virtually risk-free: they are free from default risk, and are able to consistently yield more than the inflation rate.
- In terms of rate of return, savings deposits provided an inferior alternative. The real value of savings deposits declined by 30% over this period. This is a cause for concern particularly for small savers for whom savings deposits probably constitute the only vehicle for their financial savings. Such a situation may be due to market imperfections and regulatory costs.
- Likewise, dollar deposits proved an inferior choice: the risk from FOREX rate fluctuations was not adequately compensated by higher yields (in the form of interest income and foreign exchange gains).
- Two other exceptions to the high return-high risk principle were observed: the low return on mining stocks, and the higher yield of risk-free treasury bills compared to time deposits. The former does not necessarily imply an imperfect market. If negative factors were largely continuing and unexpected, rates of return can be low or negative for an extended period. We attribute the latter exception to possible imperfections in the treasury bill and deposit markets.
- The effective tax rate is least for stocks, assuming the same trading frequency across investment instruments. However, stocks are subject to taxes even when yields are negative.
- On the whole, the rates of return observed bode well for the future of capital market development in the Philippines. They suggest a financial market which is able to compensate investors for the major types of investment risks. ■

REFERENCES

1. Ibbotson, Roger and Rex Sinquefeld. **Stocks, Bonds, Bills and Inflation: Historical Returns (1926-1987)**. (Charlottesville, Virginia: The Research Foundation of the Institute of Chartered Financial Analysts), 1989.
2. Ybanez, Roy, "Philippine Financial Markets Development, 1975 - 1990," FINEX Foundation Professorial Chair Lecture, UP College of Business Administration, Revised May 1992.

Notes on the Estimation Procedures

- [1] Promissory notes and commercial papers have been excluded because of the limitations of published interest rate data. Published interest rates for these asset classes are averaged for the entire range of maturities. Using published WAIR would introduce an unverifiable term premium bias in computed rates of return.
- [2] Following Ibbotson and Sinquefeld, derived rates of return are estimated by division or geometric subtraction. This means that if C is to be derived from A and B, e.g., C is the real rate, A the nominal rate and B the inflation rate:

$$(1 + C) = (1 + A)/(1 + B) \text{ and,} \\ C = (1 + A)/(1 + B) - 1$$

The alternative method is to compute series differences:

$$C = A - B.$$

- [3] Despite the limited number of observations, annual returns are computed and presented. We expect readers would try to compute it anyway, possibly incorrectly, and hence, we opted to show mean annual return to avoid the latter possibility. The annual return is computed by compounding (linking) monthly returns. The mean refers to the annual returns thus computed. Standard deviation of returns were not computed.

Since there are a total of 68 monthly observations, there are only 8 monthly observations for the sixth year. The sixth year's annual return was estimated by compounding the 8-month geometric mean for another four months. This of course gives a disproportionate weight to the 8-month return in the mean

annual return.

- [4] A stock index is a "market-value-weighted benchmark of common stock performance. Market-value-weighted means that the weight of each stock in the index, for a given month, is proportionate to its price times the number of shares outstanding (i.e., market capitalization) at the beginning of that month." [Ibbotson and Sinquefeld]

The composite stock index currently consists of a diversified portfolio of 27 companies (out of 166 companies listed as of June 1992) accounting for

about 40% of total stock market capitalization. Its component stocks are further sub-grouped to form the commercial-industrial (13 stocks), mining (8 stocks), and oil (6 stocks) indexes. Currently, the composite index is market-value-weighted at about 92% for C-I stocks, and 4% each for the mining and oil stocks.

- [5] Published interest rates are simple averages of weekly rates reported by ten commercial banks sampled by the Central Bank. Beginning in 1992, rates on "special" types of savings deposits which are generally higher, are included in this average.