CHAPTER III

ANALYSIS OF FINANCIAL PRODUCTIVITY IN COMMERCIAL BANKS: A THEORETICAL FRAMEWORK

Purpose and Overview:
Commercial banks, being the financial intermediaries, are service-oriented but not production-oriented commercial organizations. They are expected to put every rupee procured from the public to a productive purpose in a judicious manner so that their financial strength is ensured and the impact of their operations on GDP would be positive in the process of financial intermediation. However, there is dearth of literature developed for quantifying the productivity of commercial organisations. This may be mainly due to the fact that the commercial banks are multi-input and multi-output organisations. Against this background, a modest attempt has been made in this chapter to provide a brief account of the literature developed so far for measuring and evaluating the banks' productivity and also of the approaches or models used in the present study for analyzing the financial productivity of the case bank i.e. the Syndicate Bank, under study.

Introduction:
Process of liberalisation of the economy, initiated in India since 1991-92, aimed at raising the allocative efficiency of available savings, increasing return on investments and promoting accelerated growth and development of the real
across the entire gamut of the financial system in order to promote a diversified, efficient and competitive financial system. The thrust of the process has been to cut costs and raise the productivity efficiency of the banking sector as a whole. But, measuring bank efficiency (and also productivity) is difficult because there is no satisfactory definition of bank output. Comparisons based on operating costs and margins are fraught with problems. They stem substantial differences in capital structure (leverage), business or product mix, range and quality of services, inflation rates, and accounting conventions (especially about the valuation of assets, the level of loan loss provisioning, and the use of hidden reserves).

Banks are typically multi-input and multi-output firms. As a result, defining what constitutes 'input' and 'output' is fraught with difficulties, since many of the financial services are jointly produced and prices are typically assigned to a bundle of financial services. Additionally, banks may not be homogeneous with respect to the types of output actually produced. In view of these complexities, four approaches have come to dominate the literature on banking output:

(a) Production Approach,
(b) Intermediation Approach,
(c) Operating (income based) approach, and
(d) CAMEL Approach.

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1 Abhiman Das: "Risk and Productivity Change in Public Sector Banks", Economic and Political Weekly, Feb.2, 2002, P: 437
(a) Production Approach:

This approach of measuring banks' productivity is based on the basic premise that the banks are fundamentally engaged in providing services, viz: credit-related services, deposit-related services and ancillary services. Manpower, material, space, information system, etc; are considered to be input and the output is measured in terms of the number of deposit accounts opened or the number of loan accounts or the number of beneficiaries to whom the ancillary services are provided. Credit per employee, deposit per employee, etc are some of the parameters used for appraising the banks' productivity under this approach. No doubt, this approach throws light on physical productivity. But it fails to measure financial productivity i.e. the acceleration or deceleration rate of banks' wealth.
(b) Intermediation Approach:

As per this approach, the banks are considered to be connecting links between the savers of the money on the one hand and users of funds on the other hand. Sum of operating and interest expenses are treated as input. Loans and other major assets are counted as output. However, this measure may not sound to be an effective tool in measuring the effective contribution of banks as intermediaries in the process of accretion or accumulation of bank's wealth.

This intermediation approach has three variants, viz; asset approach, user-cost approach and value-added approach. Under the asset approach, Deposits and other Liabilities together with real resources (labour and physical capital) are defined as input; whereas the loans and Investments (i.e. earning assets) are defined as output. As per the user-cost approach, whether a financial product is an input or an output is determined on the basis of its net contribution to the bank revenue. If the financial income of an asset exceeds its opportunity cost or the financial cost of a liability is less than its opportunity cost, it is said to be an output. In the reverse case, it is considered to be an input. However, under the value added approach, the deposits schemes introduced, loans provided, etc., are treated as significant portion of value added.

As per the value added approach, the different types of deposit schemes and loans are treated as output as they would be constituting a major portion in the value added.

C) Operating Income Approach (Risk-Return Model)

This approach is based on the philosophy that revenue is generated from the cost incurred during the operating year.
Hence, total revenue (i.e. aggregate of interest income and non-interest income) is defined as output and the total expenses (i.e. sum of interest expenses and operating expenses) as inputs. If the former happens to be more than the latter, the concerned bank is said to be productive; and vice-versa.

This model may also be called as 'Risk-return model'. The term 'risk' in this context, refers to the minimum rate of return that is expected by an investor. The bank, whose net return exceeds the risk, is said to be financially productive and vice-versa. If the risk sown is equal to the return grown, such a bank is said to be characterized by financial stability.

**D) Camel Approach**

CAMEL is the acronym for Capital Adequacy, Asset Quality, Management, Earnings and Liquidity. As per this model, bank's financial soundness and thereby its productivity are manifested by the integrated view of all the five elements involved in CAMEL. However, the CAMEL technique sounds more as tool of financial soundness of the bank rather than the tool of productivity evaluation.

**Return on Equity (ROE) Model:**

A bank manager role is to make and implement decisions that increase the value of shareholders' wealth⁴. ROE is the function of return and equity. To put it in an equation form;

\[
\text{ROE} \% = \frac{\text{Return}}{\text{ATE}} \times 100
\]

The term 'return' here refers to net income and ATA refers to average total assets.

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Return to the bank is defined by the following equation:

\[ \text{Return (or net income)} = \sum_{i=1}^{n} R_i \times A_i - \sum_{i=1}^{n} C_i \times L_i - \text{Burden} - \text{PLL} \pm \text{Security gains or losses} - T \]

Where,

- \( Y_i \) → Yield or Rate of return from bank's \( i \)th asset
- \( R_i \) → Rate of Interest on \( i \)th item of asset
- \( A_i \) → \( i \)th item of bank's asset
- \( C_i \) → interest rate \( i \)th loan item
- \( L_i \) → \( i \)th loan amount
- \( PLL \) → Provisions for loan losses
- \( T \) → Taxes

Net income in excess of dividend payments to shareholders result in an accretion in the wealth of the shares. Such a bank is said to be financially productive.

**Factors influencing the ROE:**

Return on equity is a multivariable phenomenon. The chart 3.2 reflects the decomposition of ROE:

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Chart 3.2 Decomposition of ROE

Net on Equity = Net Income / Avg Total Equity

Equity Multiplier = aTA / Avg total equity

Asset Utilization = Total Revenue / aTA

Interest Income = Total Revenue / aTA

Noninterest Income = aTA

Noninterest Expense = aTA

Provisions for loan losses = aTA

Vol. Of Interest - Bearing Liab.

Cost of each Liab. = Int exp on liab. j / amnt. of liab j

Salary and employee benefits = aTA

Occupancy expenses = aTA

Other Expenses = aTA

Yield on Each Asset

Composition of Asset.

Vol. Of Earning Asset

Fiduciary income = aTA

Services charges and fees = aTA

Trading revenue = aTA

Other noninterest income = aTA

Note: aTA is average total assets
Decomposition of ROE reveals its contributing elements. Basically, ROE is arrived at by dividing the net income by average total equity and this measures the percentage return each rupee of shareholders' equity. ROE is the product of ROA and Equity multiplier and when stated in the form of equation

\[
\text{ROE} = \text{ROA} \times \text{Equity Multiplier}
\]

\[
= \frac{\text{Net Income}}{\text{Average Total Assets}} \times \frac{\text{Average Total Assets}}{\text{Average Total Equity}}
\]

Where ROA = \(\frac{\text{NI}}{\text{ATA}}\)

\[
= \frac{\text{TR} - \text{ER} - \text{T}}{\text{ATA} - \text{ATA} - \text{ATA}}
\]

Here

\(\text{ATA} = \text{Average Total Assets}\)
\(\text{TR} = \text{Total Revenue}\)
\(\text{ER} = \text{Expense Ratio}\)
\(\text{T} = \text{Tax Ratio}\)

Here, a bank’s ROA is determined by asset utilization ratio, expenses ratio and tax ratio.

High asset utilisation ratio, low expenses ratio and low tax lead to increase in the bank's productivity as evinced by the increase in the ROA.

When asset utilisation is decomposed, it reveals that bank’s gross income results from interest income, non-interest income and gains or losses arising from the realization of securities. To put it mathematically,
Asset utilisation ratio = \frac{TR}{ATA} = \frac{II - Nil - G(\text{or} L)}{ATA ATA ATA} 

Here, II = Interest Income 
Nil = Net Interest Income 
G = Gains 
L = Losses 

High II ratio, coupled with low NII ratio and security loss ratio would result in high level of return on investments in assets and vice-versa. 

Similarly, when expense is decomposed, it manifests that the sum of interest expenses ratio, non-interest expense ratio and the ratio of loan losses equals expense ratio. 

Lower level of each of the above ratios implies higher level of productivity and vice-versa.

**ROTA Model**

The Dupont Analysis has been used for many years and can be modified slightly for Use in a financial institution. It represents a straight forward decomposition of ROA\(^6\).

\[\text{ROA} = \frac{\text{Profit margin(PM)}}{\text{X Asset Utilisation ratio (AU)}}\]

Where PM = \frac{NI}{TR}

\[\text{AU} = \frac{TR}{ATA}\]

\(^6\) Tomothy W. Koch and S. Scott Macdonal: Bank Management, Thomson (South-Western) Publishing House: Singapore, 2004, P. 113
Higher the profit margin coupled with higher asset utilisation ratio would result in favorable impact on bank's financial productivity; and vice-versa.

**EPS/MPS Model:**

The shareholders of any financial institution are basically interested in understanding the ability of the bank to create value for the shareholders over a specified period of time rather than the ROE, ROA and asset utilisation ratio at a particular point of time at the end of its accounting year. The overall addition or accretion in the value of the investment made in a bank can be examined by comparing its market values for different financial years. Market value of a bank is the product of MPS and the total number of shares outstanding. MPS, in turn, is the product of EPS and P/E ratio. Higher levels of both EPS and P/E ratio indicate high market value and vice-versa. An increasing trend in the EPS and P/E ratio over a period of time reflects that the concerned bank has been able to create value to the shareholders through improved financial performance.

**EVA:** Appraisal of bank's financial productivity, ROE, ROA, etc; does not provide the clear picture about the extent value created by the bank over and above the value creation expected by the shareholders; because the term 'return' used as numerator in the ratio of ROE is before deducting the cost of equity. Net return after tax minus cost of equity equal to residual value. To put it mathematically,

\[ EVA = Net\ operating\ profit\ after\ tax\ (NOPAT) - Capital\ charge \]
This residual value is the real wealth added to the shareholders' wealth. Bank's financial productivity is to be judged on the basis of its ability to generate residual value after covering its cost of equity. As per EVA model, a bank is said to be financially productive when its residual value (i.e. EVA) is positive.

**RAROC / RORAC Analysis:**

In recent years, the experts in the field of banking are using RAROC/RORAC analysis for evaluating banks' profitability and risk. RAROC refers to risk adjusted return on capital, while RORAC refers to return on risk adjusted capital.

Risk-adjusted Return on Capital (RAROC) is arrived at by dividing the risk adjusted income by capital. Risk adjusted income means total revenue as reduced by expected losses to be suffered by the bank due to unexpected changes in the environment. As per this Model, the net return after covering the expected losses would be a real addition to the financial wealth of the shareholders. This approach is to deflate the ROI as the return is reduced by the extent of expected losses.

Return on risk-adjusted capital (RORAC) is arrived at by dividing the net return by the risk-adjusted capital. Risk adjusted capital means capital minus maximum potential loss due to volatility in future earnings. This approach is likely to inflate the ROI as the capital, which is used as numerator, is reduced by the extent of potential capital erosion.

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