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**Effect and efficiency of Mergers and Acquisitions on the financial performance of firms in
the banking sector**

In Partial Fulfillment of the Requirements
for the Bachelor of Science in Finance

by

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ABSTRACT

The proposed research aims at finding out whether mergers and acquisitions have a significant effect on the financial performance of firms in the banking sector. The results of the review of previous literature indicates that mergers and acquisitions may have both positive and negative effects on performance of organizations. The study will be anchored on two theories which include the user cost of capital theory and the agency theory. The dependent variable for the research will be financial performance of firms in the banking sector which will be measured by investigating the effect of mergers and acquisitions on profitability, return on investment, return on equity, and earnings per share. The study will utilize secondary data obtained from the financial statements of firms in the banking sector as well as information from stock exchange platforms. Regression analysis will be used to test the research hypotheses and determine the relationship between the independent variable and the dependent variables. The results will be presented using tables and figures.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the research

Mergers and acquisitions are used as strategies for expansion, entry into new markets, and acquisition of assets as discussed by Pazarkis et al (2006). With regards to mergers, two companies come together to form one company. In this case, the shareholders from both companies retain the right to make decisions pertaining to the running of the merged business entity. On the other hand, an acquisition refers to a business transaction whereby one organization buys the stock, assets, or equity interests of the other company. In this case, the company can have full ownership or partial ownership of the target company. As such, the company gains the right to influence decisions made in the acquired company. Mergers and acquisitions as a research topic has attracted the attention of many researchers who aim at determining how these strategies affect the performance of organizations. Previous researchers have focused on acquisitions and mergers in various industries including the petroleum industry, the retail industry, the financial service industry, and information technology to mention just a few.

1.2 Research Problem

Majority of previous research carried out on the topic show that mergers and acquisitions in these industries have an effect on performance. However, even those studies carried out on the financial services industry have focused on different variables. For this reason, no previous study has focused on a combination of variables that the proposed research will focus on. These

variables include profitability, earnings per share, return of investment, and return on equity. The proposed research will seek to determine whether mergers and acquisitions have an effect on these variables as determinants of financial performance of firms in the banking sector.

1.3 Research Objectives and Questions

This research will be focused on achieving one overall and three specific objectives. The overall research objective of the study will be to identify the short-term and long-term effects of acquisitions and mergers on the financial performance of firms in the banking sector. The specific objectives of the research will be;

- To determine the effect of acquisitions and mergers on the capital structures of firms in the banking sector.
- To analyze the effect of acquisitions and mergers on profits of firms in the banking sector.
- To investigate the effect of acquisitions and mergers on the return on equity and assets.

Subsequently, the research will aim at answering the following research questions:

- What was the effect of the acquisitions and mergers on capital structures of the firms?
- How do the mergers and acquisitions affect profit margins of firms in the banking sector?
- How do the mergers and acquisitions impact on the returns on equity and assets of firms in the banking sector?

1.4 Contributions

The proposed research will have various contributions both theory and practice. With regards to contribution in theory, the research will provide insight about the adoption of acquisitions and mergers in the banking sector. Future researchers interested in conducting research in this field will be able to access valuable information to base their research on. As such, this study will be used by other researchers as reference and also for identification of research gaps to further the study. Additionally, the research will provide valuable insight to practitioners in the banking sector. The research will offer practical recommendations for managers in the banking industries on how to utilize acquisitions and mergers to enhance the performance of their firms. Therefore, significance of this study is to advise the shareholders, investors, management and regulatory authorities to think about effects of acquisitions and mergers on the financial performance of firms in the banking sector before decision making (Singh, 2015). The study will play a major role in negotiations of pending acquisitions and mergers before being affected.

CHAPTER TWO: LITERATURE REVIEW

2.1 Chapter introduction

This chapter presents reviews on researches related to the effect of acquisitions and mergers on financial performance of firms in the banking sector and will consider both theoretical literature and empirical literature (Yanan, Hamza, & Basit, 2016). Theoretical review is majorly based on related theories that are proven. However, they have limitations. Empirical literature will rely on previous studies that were carried out by other researchers on the topic with their recommendations.

2.2 Theoretical Framework

Acquisitions and mergers in organizations are mostly supported by two theories. These theories include the user cost of capital theory and the Agency Theory. Each of these theories is discussed in details in the following subsections of this proposal, with a focus on how it supports implementation of acquisitions and mergers in organizations.

2.2.1The User Cost of Capital Theory

This theory capital of any entity is owned by the company and should be invested in order to grow (Ang, Daherb , & Ismail, 2019). Hence, this theory encourages predator companies are encouraged to acquire firms or merge with other firms that will positively contribute to its growth. Firms engaging in mergers and acquisition usually consider this theory before making

their investment decision. However, this theory failed to clearly highlight on the determination of the cost of capital and projections of the expected changes in the capital structures of the firms after acquisitions and mergers.

2.2.2 Agency Theory

Shareholders appoint management team as the agents to transact on their behalf since they do not have managerial skills and time required to fully manage the day to day operation of the firms (Rossi & Volpin, 2014). This theory is affected when the managers make the decision of increasing the wealth of the firm on behalf of the shareholders. As much as acquisitions and mergers reduce the value of the predator company and increase that of the target, it highly increases the competitiveness of the consolidated firm.

2.3 Empirical review

Most entities merge or acquire others with an objective of realizing synergism. This is mainly affected when companies face financial problems and want to survive during hard times or want to expand or want to achieve a specific objective (Ang, Daherb, & Ismail, 2019). The firms consolidate with purposes of competing favorably in their markets of operation, cut on costs, improve management efficiency and acquire a larger market share. This has highly pushed the small firms to adopt acquisitions and mergers.

Various researchers have carried out studies to measure the effect of acquisitions and mergers on financial performance of firms using stock prices on stock and securities markets. These studies are limited to information that is provided to investors. A study to investigate mergers

and restructuring of organizations on performance of banks in Kenya showed that it led to a positive effect on the economic performance of banks (Mugo, 2017). Profitability and solvency ratios indicate that the banks' profitability improved as well as return on equity and assets. Mergers improved the revenues and reduced costs, leading to increase in net income of banks. Financial Performance refers to the variables used to evaluate the firm's financial health and set financial goals (Daniya, Onotu, & Abdulrahman, 2016). Financial performance measures majorly focus on the financial returns of the firm using various evaluation methods and the financial indicators. The evaluations must be carried out in pre-mergers for decision making and post-mergers to determine the effects of mergers and acquisition on the financial performance of firms. Evaluations mainly focus on profit margins, cash flow statements, rates of returns and efficiency on utilization of resources. Following are the variables which would be tested in this research:

2.3.1 Profitability

Acquisitions and mergers of organizations in the finance sector have indicated better profitability ratios (Khurana, & Wang, 2019). Profit margins are usually affected by increase in revenues and increase in net income after-tax. Profitability ratios are the key indicators of any firm's financial performance. Acquisitions and mergers may appear as very expensive initially but in the long run they greatly contribute to cost reductions, increase in net profits and increase in revenues.

2.3.2 Return on Investment

This financial ratio is based on the net profit after tax over the fully paid capital (Jallow, Masazing, & Basit, 2017). It analyzes the firm's proficiency in exploiting the invested capital in generating profits. It assists the firms to determine their abilities in determining the expected returns from their investments. Acquisitions and mergers contribute in increasing investments.

2.3.3 Return on Equity

Return on Equity assists to show how the shareholders' funds are utilized by the management effectively to create profits for the firms in the banking sector (Rashid, Bhutta, & Tamoor, 2015). High rates of returns indicate efficiency in the management when it comes to utilization of the shareholders' funds in generating the company's turnover

2.3.4 Earnings per Share

This is a financial ratio that is used to evaluate the relationship between capital employed and profits set aside to be shared amongst the shareholders (Rashid, Bhutta, & Tamoor, 2015). It was established mergers and acquisition positively contribute to increase in earnings per share for the shareholders. Earnings per share is a better tool for predicting the future cashflows of any company. The higher the earnings per share the better the cashflows of any firm.

CHAPTER THREE: RESEARCH APPROACH

3.1 Research design

The proposed research will adopt a descriptive analytical research design to investigate the effect of acquisitions and mergers on performance of firms in the banking sector. The descriptive research design allows the researcher to investigate and describe the relationship between variables. In this case, the research will focus on determining the relationship between acquisitions and mergers and the performance of firms in the banking sector. This research will be hypothetical in order for it to be meeting the required accuracy and academic standards by having a null hypothesis and alternative hypothesis that are testable (Yang & Lim, 2016). Our independent variable will be acquisition and mergers while the dependent variable will be financial performance. The null hypothesis for the research will be that acquisitions and mergers have no significant effect on the performance of firms in the banking sector. The alternate hypothesis will be that acquisitions and mergers have a significant effect on the performance of firms in the banking sector.

3.2 Data collection procedure

This study will use secondary data obtained from the financial statements of various firms in the banking sector. The financial statements will be accessed from the respective firm's websites as well as the stock and securities exchange market. Data to be obtained from the financial statements will be Return on Assets (ROA). Securities and stock exchange market data will give information on the firms that have taken part in acquisitions and mergers. The study will use data that reflect the performance of the firms prior to and after the merger took place. This data

will be compared to determine whether the merger or acquisition affected the performance of these organizations in a statistically significant way.

3.3 Data selection

The analyzed mergers were not randomly selected. Indeed, the fusions were generally selected based on features that, according to some industry observers, should result in efficiency gains from a fusion. These features are that the merger involved: (1) large firms, (2) firms with significant overlap in office, and (3) mergers that occurred in recent years, during which time cost cutting and efficiency received a great deal of attention in banking as well as other industries

3.4.1 Test model- Regression model

The study will use regression analysis as the primary statistical model. The T-test will also be used to compare the financial performance of organizations in the banking sector between before and after acquisitions and mergers have occurred. The research findings will be presented using tables and charts to demonstrate the effect of each independent variable on the performance of companies in the banking sector. The research will utilize the following regression model for purposes of determining the general economic impact of the acquisitions and mergers on the banking sector.

$$Y_i = \beta_0 + \beta_1 X_{i,1} + \beta_2 X_{i,2} + \beta_3 X_{i,3} + \beta_4 X_{i,4} + \epsilon$$

Based on this regression equation,

Y_i = The performance of organizations in the banking sector

$X_{i,1}$ = Profitability

$X_{i,2}$ = Return on investment

$X_{i,3}$ = Return on Equity

$X_{i,4}$ = Earnings per share

β_0 = The constant of the equation

$\beta_1, \beta_2, \beta_3,$ and β_4 = The coefficients of the measurement variables

ϵ = Error term of the regression model

3.4.2 Test model -VRS assumption

In this model, a hypothetical DMU is defined as a combination of two or more candidate DMUs.

The hypothetical DMU would surpass the traditional Production Possibility Set (PPS)

We selected inputs, outputs, and intermediate measures similar as follows: Inputs include (i) fixed assets, referring to the asset value of physical capital, and (ii) payroll and other operating expenses, referring to the salary of full-time working workers and the expenditures incurred during their service. Outputs include (i) non-interest income, including taxes, dividends, investment and other income from business; (ii) interest incomes, which refers to incomes that are primarily derived from loans. The intermediate measure is the bank deposits, which includes current deposits and time deposits. The data are derived from the Bank-scope resource package produced by Bureau Van Dijk (BVD).

3.4.3 Test models—DEA model

DEA has proven to be a common performance analysis methodology in general, but particularly for the banking sector. In this way, the banking sector has a number of features that make it particularly suitable for DEA study: the complexity of its various inputs and outputs, the non-linearity of its input-output relationships, the non-physical existence of certain tools and goods, and the impossibility for some of them to rely on the market price system.

Broadly speaking, the DEA technique defines a production unit's efficiency measurement by its position relative to the best performance frontier mathematically established by the ratio of weighted outputs to weighted inputs.

3.4.4 Financial ratio analysis

We use traditional financial metrics to see the impact of mergers and acquisitions on other indicators that the DEA may not have noticed, such as improvement in productivity or efficiency in production. To do that, we compare the average pre-and post-mergers and acquisitions proportions of the total commercial banks.

CHAPTER FOUR ANALYSIS AND FINDINGS

4.1 Test Results of regression model

1. Regression model: $Y_i = \beta_0 + \beta_1 X_{i,1} + \beta_2 X_{i,2} + \beta_3 X_{i,3} + \beta_4 X_{i,4} + \epsilon$

Table 1. Summary of merger case studies: Change in performance

Merger	Acquiring firm more efficient than target	Pre- to post-merger change in performance relative to peers					Stock price change			
		Return on assets	Total expenses		Noninterest expenses		Econometric estimate of "total" efficiency	Acquiring	Acquired	Net wealth effect
			÷ Total assets	÷ Total rev.	÷ Total assets	÷ Adj. oper. rev.				
SDB	Not clear	Imp	Imp	Imp	Imp	Imp	Imp	Wk	Imp	Imp
SPDB	Yes	Imp	Wk	Imp	Imp	Imp	Imp	Wk	Imp	Wk
BCM	Yes	Imp	Wk	Imp	Wk	Imp	Imp	Imp	NA	NA
BOC	Yes	Imp	Imp	Imp	Wk	Imp	Imp	Imp	NA	NA
CCB	Yes	Imp	Imp	NC	Imp	Imp	Imp	Wk	Imp	Wk
CEB	Not clear	Imp	Imp	Imp	Imp	Imp	NC	Imp	Imp	Imp
CIB	Not clear	Wk	NC	NC	Imp	Imp	Imp	Imp	Imp	Imp
ICBC	Yes	Imp	Wk	Imp	Wk	Imp	NA	Wk	Imp	Imp
CMB	Yes	Wk	Imp	Wk	Imp	Wk	Imp	Imp	Imp	Imp

Imp – Improved; Wk – Weakened; NC – No change; NA – Not available.

The key findings are listed below:

(1) all the studies found that significant cost-cutting targets were met or reached fairly quickly.

(2) four of the nine mergers showed clear efficiency gains relative to peers.

(3) seven of the nine mergers saw an increase in investment yield relative to peers. Therefore,

the net wealth effect, based on the stock price response to the announcement of the merger

4.2 Test Results of VRS assumption

Preliminary findings of variances of selected banks

Table 2 Descriptive statistics of 10 selected commercial banks

Variables	Max	Min	Mean	SD
Fixed Assets	6627.7	411.8	2059.652	1519.488
Total Expenses	650237.9	166.7	46769.011	153056.122
Deposits	614241.2	45363.9	178147.075	148080.95
Non-Interest income	18773.1	1616	6026.997	4600.262
Interest income	2853.214	93	772.257	750.117

The findings are listed below:

It is interesting here that all outputs are passed as cost controls, as the data already contain information about the product value. Therefore, when we apply our proposed approach to the data set in Table 1, we set each input price to unity. Both input, intermediate, and output units in Table 1 are in CNY 1,000. It also shows the heterogeneity of the data. For example, the fixed assets range from 411.8 to 6627.7, with the standard deviation of 1519.488.

Decomposing the potential gains from mergers

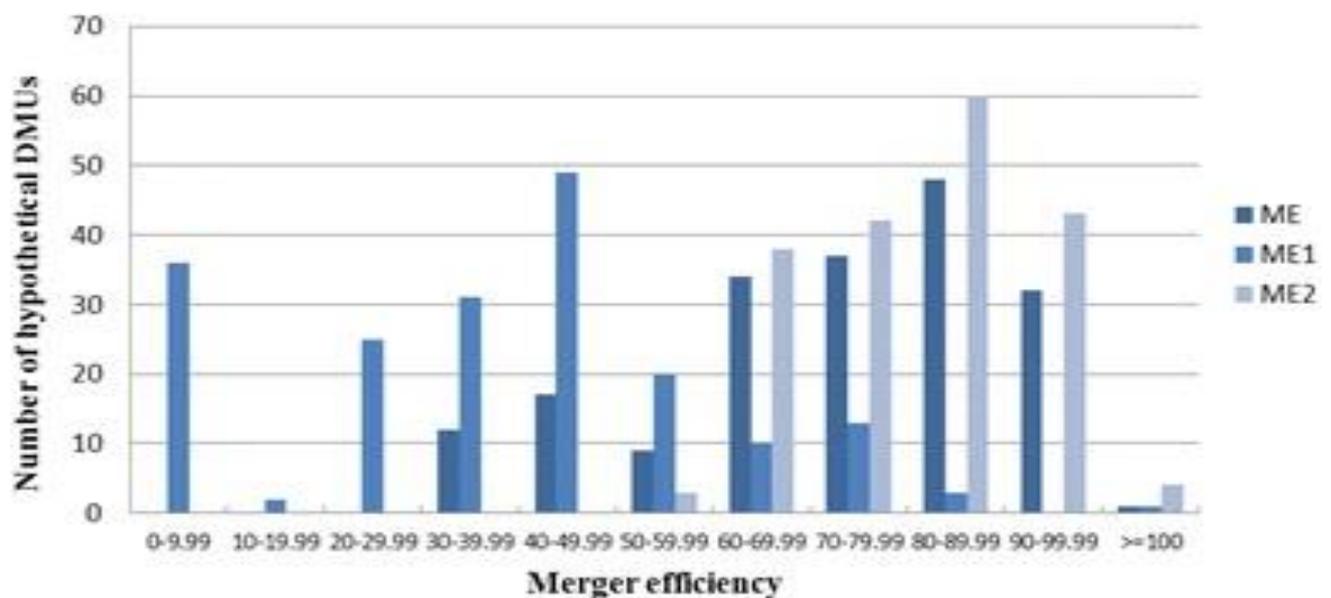
Table 3 Distribution of overall and pure merger efficiencies (<100 %) under VRS assumption

Efficiency interval in %	ME^J	ME_1^J	ME_2^J	ME^{*J}	ME_1^{*J}	ME_2^{*J}
0–9.99	0	36	0	0	0	0

10-19.99	0	2	0	0	0	0
20-29.99	0	25	0	0	0	0
30-39.99	12	31	0	0	0	0
40-49.99	17	49	0	0	0	0
50-59.99	9	20	3	0	1	0
60-69.99	34	10	38	0	3	0
70-79.99	37	13	42	1	21	1
80-89.99	48	3	60	33	43	33
90-99.99	32	0	43	104	65	103
Total	189	189	186	138	133	137

Notes*: (a) ME means total merger efficiency, ME1 means DPP, ME2 means PEP (b) DPP means deposit-producing process, (c) PEP means profit-earning process

Figure 1 Merger efficiency distribution under VRS



The key findings are listed below:

- (1) we can infer that there are significant potential benefits in mergers for the entire system as more than 97 percent of the merging performance scores of the theoretical DMUs are less than one.
- (2) It could also be found that the fusion efficiency distribution for the DPP is in the left part while the fusion efficiency distribution for the PEP is in the right part of the axis. It indicates that the hypothetical DMUs' have smaller merger efficiency scores in DPP than those in PEP. Thus, most bank mergers gain more from DPP than from PEP.

4.3 DEA model findings

DEA Inputs and Outputs

Inputs	Outputs
- Operating expenses	- Net interest income
- Interest expenses	- Non-interest income*
	- Total amount of loans and advances

Notes: * Non-interest income includes fees and commissions, foreign exchange gains, stock dividends and investment sales gains

Table 4: DEA Results

	Pre M&A			Post M&A		
	ME	PTE	SE	ME	PTE	SE
Grand frontier average score	0.599	0.709	0.765	0.817	0.916	0.897
Yearly frontier average score	0.624	0.756	0.776	0.699	0.770	0.897

Number of observations: 10

The key findings are listed below

As shown in Table 4, the annual border results show that the average managerial performance improved from 62.4% pre-consolidation to 69.9% post-consolidation. This suggests that consolidation and increased capitalization combined resulted in increased banking efficiency. A plausible reason might be the advantages of attracting a larger amount of deposits and the provision of larger amounts of loans, which in effect control higher interest rate spreads.¹⁰ The explanation for this may be that large banks appear to be more stable from the point of view of depositors and are able to set interest rates on loans they offer because they are market leaders. In fact, large banks will provide more services and significant non-interest income is generated in the process commissions, fees and other treasury activities.

4.4 Financial ratio analysis

4.4a Profitability indicators

Return on Equity (ROE)= Net Profit / Equity metrics. ROE tests productivity from the viewpoint of the investor as it shows the rate of return on the assets of the investors.

Capital Return (ROA)= Net Profit / Total Assets. It is an aggregate indicator of productivity.

Net margin of interest (NIM).

Cost to Income Ratio = Total Expenses (Interest + Overheads)/Gross Income.

4.4 b Liquidity ratios

Net Loans/Total Assets

Net Loans/Total Deposits, signifying the degree of effective intermediation.

4.4c Risk indicators

Total Capital Ratio = Capital/Total Assets

Loan Loss Reserve/Gross Loans

This proportion and the contingency factor for loan loss represents the value of the loan portfolio. The higher the allowance for loan default or conditions, the greater the risk of unredeemed loans (abolished as non-performing loans).

Findings

To sum up, the outcomes of the key financial ratios and the analysis of the average pre-and post-M&As ratios of commercial banks showed improvement in risk measures and increased capital ratio. Nonetheless, there have been no significant improvements in efficiency, liquidity or intermediation indicators that indicate that the intermediation role of the banking system can still be improved

4.5 Conclusions

By applying the proposed approach to 10 potential CCB mergers involving two branches in each merging activity, we can conclude that there may be significant potential cost savings and gains for the overall system from mergers and acquisitions(M&As) and both sub-systems under the assumption of VRS. After decomposing, we find the potential gains from the mergers of the DPP are greater than those of the PEP. From the financial ratio analysis, the findings show that M&As did not result in higher average profitability for the post-M&As Chinese banks. The lower profitability could be the result of a deterioration in cost efficiency, as the average cost to revenue of overall banks slightly increased after M&As. Liquidity ratios have also declined after M&As while Risk analysis has shown that all selected Chinese banks have a positive impact on the quality of their lending portfolios. That is, the results suggest that Chinese banks have made the M&As more significant in managing risk. Perhaps the most surprising finding from the financial analysis is that both debt to equity and loans to deposit ratios have declined significantly indicating deterioration in overall banks' intermediation function

Limitations

One of the main limitations of this study is that there might not be many firms in the banking sector that have undergone acquisitions and mergers within the last five years which is the study period. As such, it might be difficult to find sufficient sample size to use in the research. The second limitation is that different firms may use different methods of preparing their financial statements and this may lead to inconsistencies in the secondary data collected. At the same time, the research will depend on information provided by the firms in their financial statements based on the assumption that the data provided is accurate. In the event that some firm manipulated their financial statements, the validity and reliability of the research may be jeopardized. Also, The operational conditions of all DMUs are compatible in this study. While

environmental factors are particularly important when the factors are partial causes of inefficiency so developing new techniques to incorporate the environmental factors into DEA model would be a promising future study.

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Appendix

Basic DEA Models

DEA begins with a relatively simple fractional programming formulation. Assume that there are (n) DMUs to be evaluated. Each consumes different amounts of inputs i and produces different outputs r , i.e. DMU $_j$ consumes x_{ij} amounts of input to produce y_{rj} amounts of output. It is assumed that these inputs, x_{ij} and outputs, y_{rj} , are non-negative, and each DMU has at least one positive input and output value. The productivity of a DMU can be written as:

$$h_j = \frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \quad (1)$$

Where h refers to the efficiency, j is the DMU under study, x_{ij} the amounts of input consumed by DMU $_j$ to produce y_{rj} amounts of output. U and V weights assigned to each input and output.

In this formulation, u and v are the weights assigned to each input and output. By using mathematical programming techniques, DEA optimally assigns the weights subject to two constraints respectively:

The weights for each DMU are assigned subject to the constraint that no other DMU has an efficiency greater than 1 if it uses the same weights, implying that efficient DMUs will have a ratio value of 1.

The derived weights, u and v are not negative.

The objective function of DMUK is the ratio of the total weighted output divided by the total weighted input:

$$\text{Maximize } h_k = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}} \quad (2)$$

$$\text{Subject to } \frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \quad \text{for } j=1..n$$

$$v_i \geq 0 \text{ for } i=1..m, \text{ and } u_r \geq 0 \text{ for } r=1..s$$

