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     REVIEW OF LITERATURE

     NEED/IMPORTANCE OF THE STUDY

     STATEMENT OF THE PROBLEM

     OBJECTIVES

     HYPOTHESES

     RESEARCH METHODOLOGY

     RESULTS & DISCUSSION

     FINDINGS

     RECOMMENDATIONS/SUGGESTIONS

     CONCLUSIONS

     SCOPE FOR FURTHER RESEARCH

     ACKNOWLEDGMENTS

     REFERENCES

     APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

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SET THEORETIC APPROACH TO FUNDS FLOW STATEMENTS – A STUDY WITH REFERENCE TO STATE BANK OF INDIA

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ABSTRACT

Two most popular as well as basic financial statements are INCOME STATEMENTS and BALANCE SHEET. These two statements serve a very important purpose. They enlighten us about the economic goals of a business entity through the figure of net income and the presentation of the financial position of the enterprise as represented by its assets and liabilities. Nevertheless, these two statements fail to enlighten us about the other important financial aspects of a business entity. They do not give us any information regarding the financing of business operations. i.e. the manner in which the funds have been generated by the enterprise and the pattern of their utilization in such operations. This missing link in these financial statements is provided by the preparation of a additional statement called 'Statement Of Changes In Financial Position'. The statement is also known as 'Fund Flow Statement' or 'Statement of Sources and Applications of Fund'. A statement of sources and application of funds, is a technical advice designed to highlight the changes in financial position of business enterprise between two dates. It is a statement showing flow or movement of funds during a given accounting period. It is basically an inflow-outflow of funds statement. This statement has two parts : resources provided(sources of funds) and resources applied (uses of funds). The difference between the totals of the two sections indicates the net change in funds during the period. Under the above backdrop, let me present before you an interesting discourse for your cerebral exercise. It will spot on some key-issues on how funds-fiow analysis can be formulated in terms of set theory. The approach presented here provides an introduction to some basic set-theory concepts in the context of a familiar accounting problem; accordingly, definitions and explanations of these concepts are included.

KEYWORDS
Fund Flow Statement, Financial Position, Set Theory, Analysis.

1.0. BACKDROP

Two most popular as well as basic financial statements are INCOME STATEMENTS and BALANCE SHEET. These two statements serve a very important purpose. They enlighten us about the economic goals of a business entity through the figure of net income and the presentation of the financial position of the enterprise as represented by its assets and liabilities. Nevertheless, these two statements fail to enlighten us about the other important financial aspects of a business entity. They do not give us any information regarding the financing of business operations. i.e. the manner in which the funds have been generated by the enterprise and the pattern of their utilization in such operations. This missing link in these financial statements is provided by the preparation of a additional statement called 'Statement Of Changes In Financial Position'. The statement is also known as 'Fund Flow Statement' or 'Statement of Sources and Applications of Fund'. A statement of sources and application of funds, is a technical advice designed to highlight the changes in financial position of business enterprise between two dates.

Funds Flow Statement is a statement showing flow or movement of funds during a given accounting period. It is basically an inflow-outflow of funds statement. This statement has two parts :
1.   *Resources provided(sources of funds) and*
2.   *Resources applied (uses of funds).*

The difference between the totals of the two sections indicates the net change in funds during the period.

The present study demonstrates how funds-flow analysis can be formulated in terms of set theory. The approach presented here provides an introduction to some basic set-theory concepts in the context of a familiar accounting problem; accordingly, definitions and explanations of these concepts are included. *The Statement of Sources and Uses of Working Capital* Regardless of the definition of "funds" adopted, the usual first step in preparing a funds statement is the computation of the net change in funds.

This requires a separation of balance sheet accounts into fund (which enter directly into the computation of funds) and non-fund accounts (which do not). For convenience, "funds" are defined as "working capital" unless otherwise stated. Thus, current assets and current liabilities are the fund accounts and all other non-current accounts are the non-fund accounts which we refer to as non-current.

We cover but a few of the basic concepts because of space limitations. No use, for instance, is made of the set ordering brackets in this article. But were it necessary to refer to a set of current assets and were it desired to list accounts in the order of liquidity, we could stipulate this by introducing angular brackets:
Current assets = (Cash, Marketable Securities, Accounts Receivable, . . . , Prepaid Expenses).

2.0. BRIEF REVIEW OF THE AVAILABLE LITERATURE
While finding the pin-pointed research gap and appropriate research questions on the aforesaid topic, we had to jump into a glimpse of available literature, presented underneath :

Most introductory textbooks on mathematics now include a discussion of set theory concepts. For the interested reader, the following introductory material is noted:

Samuel Goldberg, Probability: An Introduction (Englewood Cliffs: Prentice-Hall, 1960), Chap. 1, pp. 1-44;

W. Allen Spivey, "Basic Mathematical Concepts," in Linear Programming and the Theory of the Firm, K. E. Boulding and W. A. Spivey, eds. (New York: Macmillan, 1960), pp. lS-24; F. Mosteller.

R. E. K. Rourke, and G. B. Thomas, Probability with Statistical Applications (Reading, Mass.: .A.ddison-Wesley, 1961). pp. 403-16.

More advanced treatment may be found in Mathematical Association of America, Committee on the Undergraduate Program,

Elementary Mathematics of Sets with Applications fNew Orleans: Tulane University, 1958); Patrick Suppes, Axiomatic Set Theory (Princeton, N. J.: Van Nostrand, 1960).

For a discussion of the mathematical logic underlying funds-flow analyses without the use of set theory concepts, see Ching-wen Kwang and Albert Slavin, "The Mathematical Unity of Funds-Flow Analyses," *NAA Bulletin,* Jan. 1965, pp. 49-56.

3.0. FINDING THE ULTIMATE RESEARCH VACUUM
After a minute study of the above available literatures, we found that no such study has yet been made in the analysis of financial statements of the corporates, especially, belonging to those in the Banking Sector.

4.0. OBJECTIVES OF THE PRESENT STUDY

In view of the above available literatures, we find the following objectives pertinent to our study :

1. To Analyse the Funds Flow Statements in a new approach
2. To make the analysis and interpretation of the Funds Flow and Cash Flow Statements more interesting and attractive to the non-commerce background people.
3. To use more mathematics for managerial decision making, depending on the financial statements.
4. To throw some light on the new approaches used by financial analysts.

5.0. INTRODUCTION TO SET THEORY

A set is a well defined collection of distinct objects. Since accounts are defined in accounting, and since each is distinct from the others, the totality of all balance sheet accounts constitutes a **set**. When a set consists of all objects under discussion in a given context it is called the universe of discourse or the universal set, which we denote by the symbol *U*. The set of balance sheet accounts is one such universal set. The individual objects which collectively comprise a given set are called its members or elements. The membership relation is denoted by the inclusion symbol €. For example, the cash account Ls an element of *U*, and we write "cash account € *U*." An exclusion symbol € is used to indicate that an object does not belong to a given set. In general, capital letters are used to designate sets while lower case letters are used to indicate elements of sets. A set can be specified by listing its members.

5.1. SET INCLUSION – CONCEPTUAL ASPECTS

Set inclusion refers to the relationship that one set is a subset o." another set.

Suppose A ⊆ B and B⊆C, then it follows that A⊆C. We say tiiat set inclusion ia a transitive relation. In set notation the transitivity relation may be wT-itten;

{R, B} ⊆ RE & RE ⊆ NC   {R, E] ⊆ NC.

The set of the sets of revenues *iind* expenses being a subset of retained earnings and retained earnings being a subset of the non-current set implies that the set of the sets of revenues and expenses is a subset of the non-current set. Henceforth, to avoid the cumbersome statement, "is a subset of the non-current set," the more compact expression, "non-current subset," or simply a non-current set, will be used.

5.2. APPLICATION OF SET THEORY IN FINANCIAL STATEMENT ANALYSIS

For our present work, in universal set *U*, we write

U = {Cash. Accounts Receivable, . . . , Plant and Equipment, . . . , Bonds Payable,

. . . , Capital Stock, Retained Earnings}.

This notation is read "the set *U* is the set whose members are the accounts Cash, . . . , Capital Stock, Retained Earnings." Alternately, a set may be defined by specifying some property (or properties) that tells us which things are members and which are not. "The universal set" can be shown (by introduction of a paradox attributed to Bertrand Russell) to be non-existent. The correct expression would be "universe of discourse"; however, "universal set" is a more compact term and will be used in this paper as a synonym for "universe of discourse."

For logical reasons, the universal set U is a subset of itself; the empty set ∅ which contains no elements is considered a subset of every set.
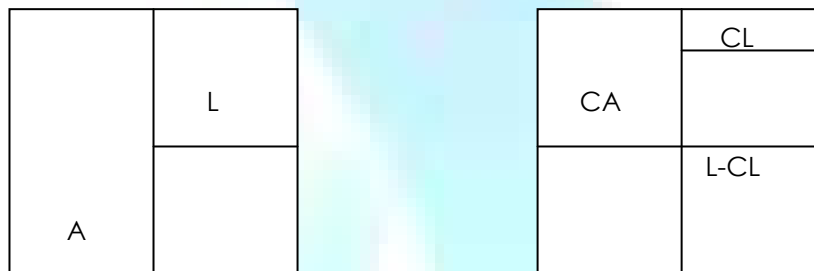
Thus we might wish to describe an asset as follows:

X € A   p, f{x).   ⟷

Something, X, is an asset (strictly translated—is a member of the set of assets. A) if and only if it is possessed, *p,* by a business and is expected to yield beneficial services in the future, *f.*

From the elements of the universal set 'U', we can form new sets which are called subsets of 'U'. For any two sets *A* and *B*, the set *A* is said to be a subset of *B* if, and only if, every element *of A is* also an element of *B.* This is indicated by *A*⊆*B*. The three major categories of balance sheet accounts, assets, liabilities, and owners' equity are subsets of the set of all balance sheet accounts. This relationship is shown (by means of a Venn diagram) in Figure 1 and 2 as above. The large rectangle represents U; the areas labeled A, *L,* and *OE* represent the three major classifications. For purposes of analyzing changes in working capital, the balance sheet accounts must be further subdivided. Figure 2 shows these relationships in terms of the subsets pertinent to the preparation of the statement oi' sources and uses of working capital, where –

A = **assets;**

CA = **current assets;**

A — CA == A = **non-current assets;**

L = **liabilities;**

CL = **current liabilities;**

L — *CL = L =* **non-current liabilities;**

OE = **owners' equity.**

This graphical method of representing sets is named after the English logician John Venn and hence called Venn diagrams. The type we used here is a special kind attributed to Lewis Carroll (Charles Dodgson). For further discussions, see Kenneth O. May, *Elements* of *Modern Mathematics* (Reading, Mass.: Addison-Wesley, 1959), pp. 152-156.

More technically, a partition of a set S is a set of subsets of *S* which are (1) disjoint, i.e., no two subsets have any elements in common; and (2) exhaustive, i.e., the elements *in* all the subsets taken together constitute the original set S.

5.3. SET THEORETICAL DEFINITIONS OF CURRENT ACCOUNTS AND NON-CURRENT ACCOUNTS

We refer to the current accounts as the current set and the non-current accounts as the non-current set. The subdivision of a set into subsets in such a way that every element belongs to one, and only one, of the subsets is called a partition of the set. In other words, every member of the original set must be contained in one of the subsets and no member must belong to more than one subset. It is sometimes convenient to be able to refer to a single account as "a current set" instead of "a member of the current set" or "*a* subset of the current set.'" To insure against ambiguity in these terms, we designate the universal set as :

Current Set

U = {Cash, Accounts Receivable, ……, Prepaid Expenses, Accounts Payable, ….., Current Maturities of Long Term Debt}

Non-Current Set

U = {Property, Plant & Equipment (net), ….., Cash Surrender Value of Life Insrance, Bonds Payable, ….., Retained Earnings}

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Each element (e.g.. Cash) of a subset (e.g.. Current Set) of the universal set can be viewed as a set in itself. When thus conceived, each, account is a set and has its own elements, we may use the expression "*cash is a current set*" as well as "*cash is a subset of the current set*" because:

1. The former expression is less cumbersome, as well as less precise.

2. The characteristic which determines membership in the current set is the condition of being considered current; therefore, it is perfectly proper to refer to a set by mentioning its identifying characteristic - in this instance, the adjective "current."

Before proceeding further, we define additional symbols as follows;

CC = contributed capital;

DIV = dividends paid;

R = revenues;

E = expenses;

Δ = the set of changes in account balances between the two balance sheet dates obtained by subtracting the beginning account balances from the ending balances. Where the distinction between a debit change and a credit change is to be made, the notation Δ_d (debit change) and Δ_c (credit change) will be used;

NC = the set of non current accounts;

S = the set of sources of funds;

U = the set of uses of funds;

T = the set containing transfers between non-current accounts, defined as transactions involving reciprocal changes in non-current accounts only. Such a transaction has no effect on funds.

$\uparrow$ = increase in an account balance;

$\downarrow$ = decrease in an account balance;

$\leftrightarrow$ = if and only if;

$\longrightarrow$ = implies,

Debit change or credit change in an account balance is used here as defined in standard accounting terminology. For a single transaction, Δ_d will be used to indicate debit parts of the transaction and Δ_c will be used to indicate credit parts.

5.4. SET THEORETICAL EXPLANATION TO FUNDS FLOW STATEMENTS

The net change in working capital for a given accounting period may be calculated as follows:

$\Delta CA - \Delta CL - \Delta L + \Delta OE - \Delta \underline{A}$ ……………………….. (1)

Equation (1) expresses the fact that the net change in funds must be equal to the algebraic sum of the changes in non-current accounts and can, therefore, be "explained" in terms of these changes; with some exceptions discussed below, debit changes in non-current accounts are uses of funds while credit changes are sources of funds. The mere listing of the changes in non-current account balances generally will not provide sufficiently detailed information for managerial purposes. Hence, in funds-flow analysis the terms on the right-hand side of equation (1) must be decomposed and/or regrouped into explanatory accounting classifications, each designated as either a source (or use) of funds or as having no effect on funds.

Therefore, we take the *set of changes in all account balances* as the *universal set* in the preparation of the fu*nds statement.* The universal set is first partitioned (as in Figure 2) into (1) changes in current account balances and (2) changes in non-current account balances. To explain the net change in funds we further form the partition *{S, U, T}* of the set of all changes in non current account balances. The set *T* has already been defined as transfers between non current accounts. The sets S and IJ are defined as follows:

For sources

$x \in S \leftrightarrow x \in \Delta_c$ and $x \in \{ \downarrow\underline{A}, \uparrow L, \uparrow CC, \uparrow R\}$ and $x \notin T,$

where *x* stands for the credit change in any account balance or one of the component credit items in the net change in an account balance.

For uses

$[y \in U] \leftrightarrow y \in \Delta_d$ and $y \in \{ \uparrow\underline{A}, \downarrow\underline{L}, CC, E, DIV\}$ and $y \in T,$

Where *y* stands for the debit change in any account balance or one of the component debit items in the net change in an account balance.

The above definitions serve to identify the sources and uses of funds. For example, a stock dividend declared is a transfer between non-current accounts and, hence, is neither a source nor a use of funds. Bad debts expense, on the other hand, involves a non current account (retained earnings) and a current asset valuation account; and it is, therefore, a use of funds within the definitions employed here. In general, the net change in each of two accounts—fixed assets and retained earnings—is effected by more than a single source or a single use of funds. Consequently, further analysis of these accounts is necessary in order to isolate all the sources and uses involved. For fixed assets (net of ' accumulated depreciation), the following equation will serve (observe that the symbols below- are not intended to be sets but merely labels for the variables in an equation):

$B_e = B_o + A - D - BVD,$

where

B_e = ending balance,

B_o = opening balance,

A = acquisitions,

D = depreciation, + Loss or – Gain.

BVD = book value of disposals = proceeds

Acquisitions are, of course, uses of funds; the current depreciation charges and the disposition of fixed assets, however, must be considered in relation to the retained earnings account. Since all revenue and expense accounts are subsets of retained earnings and since retained earnings is a subset of the non-current set, by transitivity of set inclusion, all revenue and expense accounts are also subsets of the non-current set. Consequently the provision for depreciation is a transfer between non-current accounts and does not, therefore, affect the funds position. The decrease in fixed assets upon disposal is combined with any gain or loss reflected in the retained earnings account to obtain the total funds from disposal. The decomposition of the net change in an account balance and the regrouping of terms are guided by the accounting meaning of the subtotals thus derived and the objectives of the analysis.

The analysis of the retained earnings account is also directed toward the segregation of transactions which affect the account balance. The net income for the period and dividends are generally the major items affecting the ending balance of retained earnings. While dividends are uses of funds, the net income figure customarily enters into the computation of "funds provided by operations" as a source of working capital. In determining the funds provided by operations, the conventional approach is to begin with the net income per income statement and make all necessary adjustments to it until the amount of funds provided by operations is obtained. An alternate approach is to list separately as sources all revenues which increase working capital, and as uses all expenses which decrease working capital. The definitions of sources and uses of funds given above are designed to implement this alternate method. Therefore, individual items of revenue and expense must be identified and classified as sources of funds, uses of funds, or as transfers between non-current accounts.

That is to say, retained earnings contains the effects of all revenue and expense accounts as a result of the closing process; hence, revenue and expense accounts may be considered subsets of retained earnings, that is, $\{R, E\} \subseteq RE$.

There are unusual situations where it is considered desirable to show a transfer between non-current accounts as both a source and a use of funds. For example, suppose real estate is exchanged for capital stock. Although this transaction will neither increase nor decrease the amount of funds, it might be deemed advisable to show the details of the transaction on the funds statement by assuming hypothetical intermediate cash exchanges. Such a situation could thereby be made to conform to the general definitions of sources and uses of funds that have been presented.

Finally, it might be mentioned that in some instances aggregation of accounts will lead to the destruction of subset information. For instance, there may be no net change in long-term, notes payable although those on the beginning balance sheet may have been refinanced. Had these accounts been disaggregated showing two different issues of notes, then both a source and a use would have resulted from the application of the definitions.

5.5. SET THEORETICAL EXPLANATIONS TO CASH FLOW STATEMENTS

The basic logic of the preparation of the cash-flow statement is the same as that in the construction of the statement of sources and uses of working capital. While the term "cash-flow" has been used to refer to a variety of different concepts, we shall adopt here the common textbook definition of "cash" as the cash account balance. Let C = cash account, and A — C = G = non-cash assets. We can then rewrite equation (1) as

$\Delta C = \Delta L + \Delta OE - \Delta \underline{C}.$ .... (2)

In terms of set theory, the universal set is here partitioned into:

$$[\{\Delta C\}, \{\Delta L, \Delta OE, \Delta \underline{C}\}].$$

The sources and uses of cash are elements of the set $\{\Delta L, \Delta OE, \Delta \underline{C}\}$ and are defined as follows :

$$[x \in S] \longleftrightarrow X \in \Delta_C \text{ and } x \in \{\underline{C}, L, CC, R\} \text{ and } x \text{ is not merely a transfer between non-cash accounts :}$$

$$[y \in U] \wedge y \in \Delta_d \text{ and } y \in \{\underline{C}, L, CC, E, DIV\} \text{ and } y \text{ is not merely a transfer between non-cash accounts.}$$

The similarities between these definitions and the previous ones are readily apparent; note especially the restriction on transfers. In general, depending on the definition of funds, this restriction might be worded, "w is not merely a transfer between NON-FUKD accounts." The same qualifications that were mentioned in our discussion of sources and uses of working capital apply to these definitions also.

It is easily seen that analysis of cash balance changes consists in the decomposition and/or regrouping of terms on the right-hand side of equation (2). The major step in this analysis is the derivation of the "net cash receipts from operations" which is the difference of "cash receipts from operations" and "cash disbursements for operations." For convenience, we will also refer to these terms as the "net profit or income on cash basis," "sales on cash basis," and "operating expenses on cash basis." The procedure followed is to make adjustments to the profit and loss items reported on an accrual basis." The following symbols will be used:

S_i = sales on basis i where i = a (accrual), c (cash);

AR = accounts receivable net of allowance for bad debts;

BD = bad debts expense;

E_i = operating expenses on basis i, i = a (accrual), c (cash);

INV = merchandise inventory;

AP = accounts payable;

CS_i = cost of sales on basis i, i = a (accrual), c (cash);

D = depreciation expense;

AE = accrued expenses;

PE = prepaid expenses.

The cash receipts from operations is computed as follows:

$S_c = (S_a - BD) \sim \Delta AR$ .... (3)

There are two major components of "cash disbursements for operations," namely, "cash payments for purchases" (CS_c) and "cash operating expenses" (E_c). These are defined by the following formulae:

$CS_c = CS_a + \Delta INV - \Delta AP,$ ....(4)

$E_c = E_a - (BD + D) + (\Delta PE - \Delta AE)\}$ .... (5)

The "net cash receipts from operations" is then determined by

$S_c - \{CS_c + E_c\}.$

The "net cash receipts from operations" is also referred to as the "cash increase from operations."'

If there exist other non-cash expenses, these will also have to be subtracted from the operating expenses on accrual basis *{E^)*. The notation that has been employed in equations 3, 4, and 5 takes advantage of the sign of each change and is, therefore, compact.

Any remaining changes in current assets and in current liabilities will be treated in the same way as changes in non-current accounts, since the primary partition of the universal set is based on the dichotomy of "cash" and "non-cash" accounts. For example, an increase or a decrease in marketable securities will be listed as a separate use or source of cash. It is easy to see that, after the amount of net cash receipts from operations has been determined and any remaining changes in current accounts properly classified, all other changes in non-current accounts are treated exactly as under the funds (working capital) statement.

5.6. AN ILLUSTRATION TO THE ABOVE EXPLANATIONS

A simple example illustrates the previous discussion. The comparative balance sheets and the profit and loss statement *of* a fictitious company are shown in Exhibit A. Assume that reconstruction of the property and retained earnings accounts of the company shown:

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PROPERTY ITEMS (NET)

Opening balance	80,000	Depreciation	12,000
Equipment purchases	87,000	Book value of equip, sold—	5,000 (A)
		Closing balance	150,000
	1,67,000		**1,67,000**

(A) Book value of disposals = $5,000 = Cost ($25,000) — accumulated depreciation ($20,000) - Loss on sale of equipment ($3,000) + proceeds from sale ($2,000)

RETAINED EARNINGS

Dividends	30,000	Opening Balance	80,000
Closing balance	115,000	Net income	65,000
	1,45,000		**1,45,000**

Increasing and decreasing changes, the equations could be rewritten as follows:

$$S_c = S_a \pm \uparrow AR - \downarrow BD \quad \dots\dots\dots\dots\dots \quad (3')$$

$$\uparrow AR$$

$$CS_c = CS_a \pm \uparrow INV \pm \downarrow AP \quad \dots\dots\dots\dots\dots \quad (4')$$

$$\downarrow INV \quad \uparrow AP$$

$$E_c = E_a \pm \uparrow PE \pm \downarrow AE - BD - D \dots\dots\dots \quad (5')$$

$$\downarrow PE \quad \uparrow AE$$

This numerical illustration is adapted from A. Wayne Corcoran, "A Simplified Worksheet for the Funds and Cash-Flow Statements,'" *NAA Bulletin,* Sept. 1964, pp. 35-40.

6.1. METHODOLOGY OF THE PRESENT STUDY

For the present research work, we used simple set theoretical approach in explaining the Funds Flow and Cash Flow Statements of State Bank of India, our selected company, for the study.

6.1.1. PERIOD OF STUDY

We used the financial statements, i.e., Profit & Loss Account and Balance Sheet of SBI for the current two financial years, i.e. 2011-12 and 2010-11 (as available from the website www.moneycontrol.com), in order to prepare the funds flow and cash flow statements of the same, for the current year.

6.1.2. NATURE OF DATA

We used secondary data, i.e., the financial statements like Profit & Loss Account and Balance Sheet of SBI for the current two financial years, i.e. 2011-12 and 2010-11 (as available from the website www.moneycontrol.com),

6.1.3. TOOLS FOR ANALYSIS

We used simple mathematical tool like set theory, to analyse and interpret the funds flow statements of the selected company under study and also venn diagram to interpret the results. We also used simple mathematical equations for the said purpose.

6.2. DATA ANALYSIS

From the above-mentioned financial statements, we prepared the Statement of Funds from operations, Statement of Changes in Working Capital and Funds Flow Statements of State Bank of India, which are presented in Table 5.1., 5.2. and 5.3. as follows :

TABLE 1 : STATEMENT FOR THE CALCULATIONS OF FUNDS FROM OPERATIONS FOR THE YEAR ENDED 31ST MARCH 2012

Particulars	Amount in crores
Fund from Operations	
Net profit as per P/L account	11713.34
Adjustments for	
Add: Provision for Taxation	6776.02
Net Profit before Tax	**18,483.36**
Add: Depreciation Debited to p/l account	1007.16
Add: Provision for Depreciation in Investment	663.70
Add: Provision for Standard Asset	978.81
Add: Provision for NPA	11545.85
Add: Interest on capital Paid	3592.20
Add: Other Provision Written off	(98.13)
Less: Dividend from Subsidiaries / joint venture	767.35
Add: Loss on sale of Fixed Asset	44.15
Add: Loss on sale of Investment	919.74
Net Fund Flow from Operations	**36369.49**

TABLE 2 : CHANGES AS PER CASH FLOW STATEMENT

CHANGES AS PER CURRENT ASSETES:	RS.('000)	RS.('000)
CASH & BALANCE WITH RBI	-403195634	
BALANCE WITH BANK & CALL MONEY	146085806	-257109828
INVESTMENTS		173120378
ADVANCES		1221480724
OTHER ASSETS		78972360
SUB-TOTAL (A)		**1216463634**
CHANGES AS PER CURRENT LIABILITIES:		
DEPOSITS		1092347620
BORROWINGS		70442726
OTHER LIABILITIES		-250509748
SUB TOTAL-(B)		**912280598**
NET CHANGES IN WORKING CAPITAL=(A-B) [ΔCA - ΔCL]		**304183036**

Increasing and decreasing changes, the equations could be rewritten as follows:

$$S_c = S_a \pm \underset{\uparrow AR}{AR} - BD \qquad \dots\dots\dots\dots\dots \qquad (1)$$

$$CS_c = CS_a \pm \underset{\downarrow INV}{\uparrow INV} \pm \underset{\uparrow AP}{\downarrow AP} \qquad \dots\dots\dots\dots\dots \qquad (2)$$

$$E_c = E_a \pm \underset{\downarrow PE}{\uparrow PE} \pm \underset{\uparrow AE}{\downarrow AE} - BD - D \dots\dots\dots\dots \qquad (3)$$

TABLE 3 : FUNDS FLOW STATEMENT AS ON 31.03.2012

SOURCES OF FUND	RS.('000)	APPLICATION OF FUND	RS.('000)
FUND FROM OPERATION	363694532	CHANGE IN WORKING CAPITAL	304183036
ISSUE OF EQUITY SHARES	78913087	INTEREST PAID ON CAPITAL INSTRUMENTS	35922091
INCOME ON INVESTMENT	7673515	TAX PAID	87087529
EFFECT OF EXCHANGE FLUCTUATION ON TRANSLATION RESERVE	22170951	INCREASE IN FIXED ASSETS	17103468
NET CASH AND CASH EQUIVALENTS TAKEN OVER FROM ERSTWHILE SBICI BANK LIMITED ON AMALGAMETION	414122	INCREASE IN INVESTMENT IN SUBSIDIARIES ,JV, ASSOCIATES	7055695
		DIVIDEND PAID INCLUDING TAX	21514388
	472866207		**472866207**

6.3. SET THEORETIC EXPLANATIONS TO THE ABOVE STATEMENTS
Let us use the following Notations :
For Sources of Funds
FO = Funds from Operations
ES = Issue of Equity Shares
II = Income on Investments
TR= Effect of Exchange Fluctuation on Translation Revenue
CE=Net Cash and Cash Equivalent taken over from erstwhile State Bank of India Limited on Amalgamation.
S= Sources of Funds
For Uses or Applications of Funds
CWC = Changes in Working Capital
ICI = Interest paid on Capital Investments
TP = Tax Paid
IFA = Increase in Fixed Assets
IIS = Increase in Investments in Subsidiaries, Joint Ventures, Association etc.
DPT = Dividends paid including Tax
A= Applications of Funds

From the above notations, we draw the following Venn Diagrams 1 & 2. In Venn Diagram 1, S denotes the Sources of Funds as Universal Set and in Venn Diagram 2, A denotes the Applications of Funds as Universal Set.
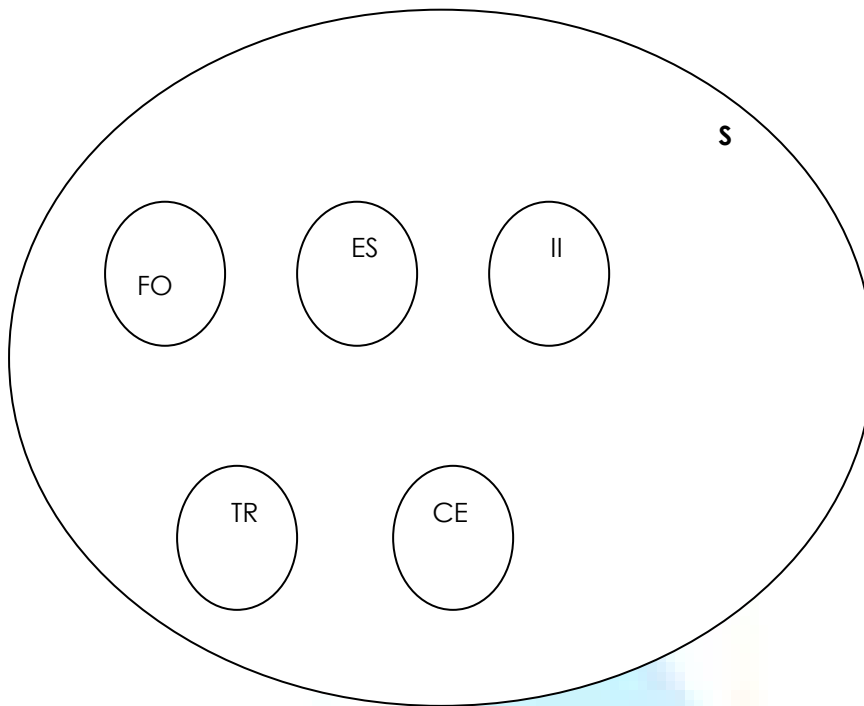
$$\text{Therefore, } S = FO \cup ES \cup II \cup TR \cup CE \dots\dots\dots\dots\dots\dots\dots \text{ (1)}$$
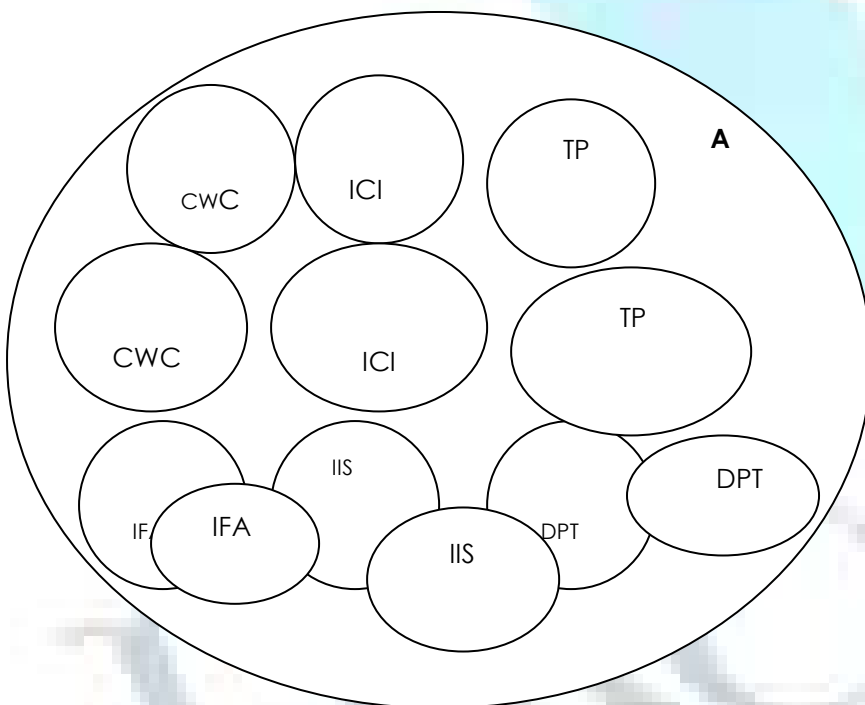
Therefore, CWC ∪ ICI ∪ TP ∪ IFA ∪ IIS ∪ DPT ....(2)
As, S = A,
Therefore, Eq. (1) = Eq. (2),
i.e., (FO ∪ ES ∪ II ∪ TR ∪ CE) = (CWC ∪ ICI ∪ TP ∪ IFA ∪ IIS ∪ DPT).

<u>**For Net Changes in Working capital:**</u>
ΔCA= Changes in Current Assets
C= Cash
⌐➔ CB= Cash Balance with RBI
  BB= Balance with Bank and Call money
Ad= Advances (increase)
Inv= Investments (Other than investments in subsidiaries/JV/associates)
OA= Other Assets

From the above notations, we draw the following Venn Diagram

And again,

ΔCL= Changes in Current Liabilities

D= Deposits

B= Borrowings

OLP= Other Liabilities & Provisions

From the above notations, we draw the following Venn Diagram
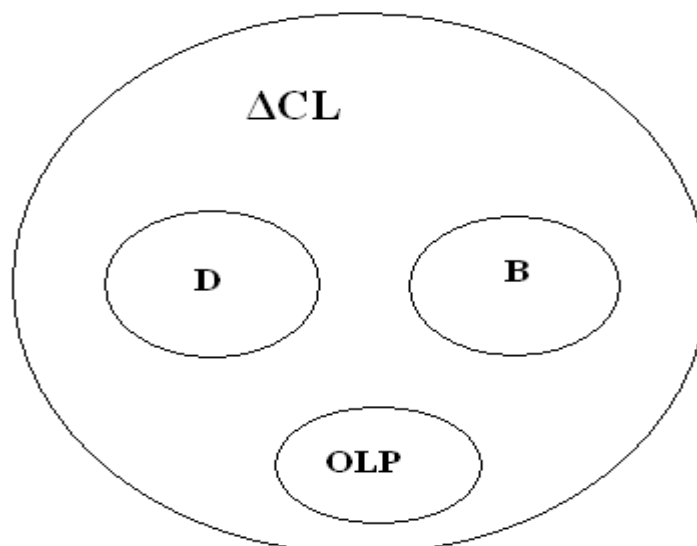
Therefore, Net Changes in Working Capital =ΔCA – ΔCL

5.4. FINDINGS FROM THE ABOVE STUDY

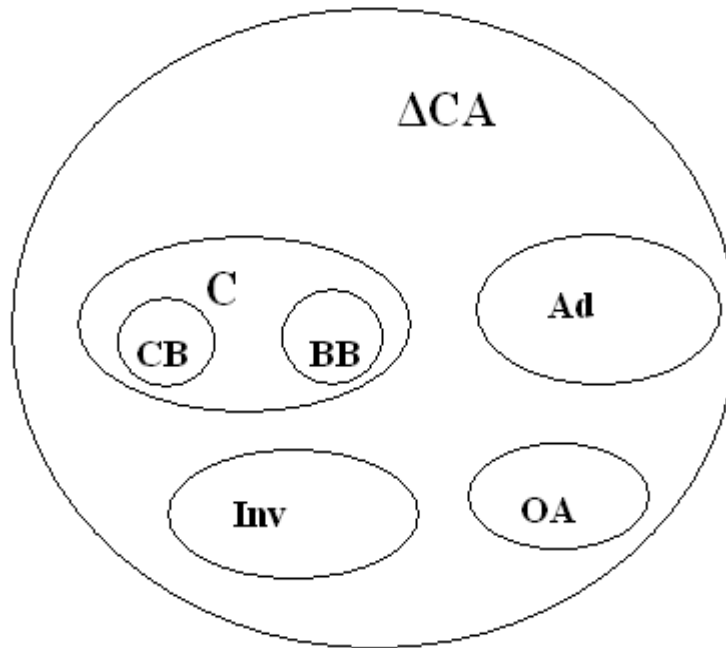From the above analysis, we see that the sources and applications of funds are the universal sets S and A respectively and their different sources and sub-sources are denoted as different subsets, which may be equal or equivalent, depending on their nature of explanation. Therefore, the portion of NPA or Standard Asset etc. could be easily measured as a subset of the total sources of funds or its applications, for example, and their changes should be equated or derivated to find the net **pie**, instead or traditional accounting calculations. This may show us some new ways to the analysts as how to explain the financial statements and their changes.

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