Chapter II

THE INTER-RELATIONSHIP BETWEEN MACRO-ENVIRONMENT AND GENERAL INSURANCE BUSINESS-THEORETICAL ELABORATION
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Chapter - II

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CHAPTER II

THE INTER-RELATIONSHIP BETWEEN
MACRO-ENVIRONMENT AND GENERAL INSURANCE
BUSINESS - THEORETICAL ELABORATION

I) INTRINSIC NATURE OF PROBLEM OF INTER-RELATION
BETWEEN MACRO ENVIRONMENT AND GENERAL INSURANCE
BUSINESS.

After introduction of the theme of 'Transformation of Operational Norm in tune with Macro-Environment Transformation' in Chapter I, its theoretical elaboration through clarification of terms is undertaken in Chapter II.

Clarification of Terms

A) Macro Environment:

'Macro Environment' of Society signifies total arena of human activity comprising constituent sectors - Political, Social, Economic and Technological. The global canvas of Macro Environment shows diversity
of patterns in its constituent units in terms of Political-Socio-Economic models and various levels of technological development. This study is limited only to the effect of various characteristics of Macro Environment of any country on the operational norm of its General Insurance Industry. For basic theoretical discussion of the problem under consideration, Macro Environment of the Insurance Market under consideration will be notified by symbol ME_r - 'r' represents the member of the global market under consideration. Equation interlinking Macro Environment with its constituent factors will be given as:

\[ ME_r = P_r + E_r + S_r + T_r \]

**Vectors**

- \( P_r \) - Political
- \( E_r \) - Economical
- \( S_r \) - Social
- \( T_r \) - Technological

Extending this relation to cover global scenario, the equation will be:

\[ \sum ME_r = \sum P_r + \sum E_r + \sum S_r + \sum T_r \]

\[ r = 1 \quad r = 1 \]

33
'n' = Population of Member countries constituting global community.

To simplify study of global scenario, members will be classified in three major groups, which upto 1990, represented constituent sectors of international community:

1. Developed countries
2. Communist block countries
3. Developing countries

B) General Insurance Industry:

The term 'General Insurance' is used in this thesis in the same sense as stipulated in the legislation of almost all countries to signify all types of Insurance Business excluding Long Term Insurance. The term Long Term Insurance is defined to denote Life Insurance and all other types of Long Term Insurance.

The global term 'General Insurance' covers as per convention followed in most of the countries following classes of business:
1. Fire Insurance
2. Marine Insurance
3. Accident Insurance
4. Motor Insurance
5. Aviation Insurance
6. Liability Insurance

The classes stated above are given wide interpretation to cover all types of insurance like Engineering Insurance, Nuclear Risk Insurance, Electronic Equipment Insurance, Oil Rig Insurance, Satellite Insurance, Bio-technology Insurance, Professional Liability Insurance of all types, developed during the period 1950 to 1990 or are in the process of development thereafter.

The scope of General Insurance also includes the schemes of Crop Insurance and Medical Insurance, which cover two principal needs of Human Society.

Vital gist of General Insurance Industry’s function can be summarized as the sector of Financial Service providing cover against Financial Losses, which the individual or community suffers from destruction, loss or damage to the property and plant or incurring of legal liabilities, arising from Physical Hazard risks of Production Technology and
Transit systems or Catastrophic Calamities of Nature or Contributed by Moral Hazard risks of Individual or Community. It also covers Financial Loss or Liability arising from death or disability of insured persons from accident. In this thesis, consideration will be mainly given to the Macro Problems of General Insurance business as a class, but specific cases from constituent classes of business will be taken to highlight the widening scope or limitations of industry in meeting the increasing needs of society in dynamic Macro Environment.

General Insurance Industry of member ‘r’ of International Market will be denoted by symbol GI\(_r\) and it will be linked with its operational factors :-

1) Structural, 2) Statutory, 3) Financial, 4) Development, 5) Management, 6) Technological, 7) Social and 8) International by equation:

\[ GI_r = ST_r + SR_r + F_r + D_r + M_r + T_r + S_r + I_r \]

Extending this relation to cover International Insurance Industry, the equation will be:
\[ \sum_{r=1}^{n} \sum_{r=1}^{n} \]

\[ \Sigma GI_r = \sum_{r=1}^{r=n} ST_r + SR_r + F_r + D_r + M_r + T_r + S_r + I_r \]

\[ n = \text{Population of the members of International Insurance Industry.} \]

To simplify study of global General Insurance Industry, markets will be classified in the same groups as categorised for the study of Global Macro Scenario.

C) Inter-relation between Macro environment and General Insurance Industry:

For illustrating inter-relation between diverse vectors of Macro Environment and Operational Factors of General Insurance Industry following linkage between them is demonstrated from the data derived from diverse sectors of Global Market in broad general terms:
### Macro Environment of General Insurance Market

<table>
<thead>
<tr>
<th>General Insurance Industry</th>
<th>General Insurance Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structural Norm $ST_r$</td>
</tr>
<tr>
<td><strong>P_r Political Status</strong></td>
<td></td>
</tr>
<tr>
<td>a) Colony</td>
<td>a) Dominant Sector -</td>
</tr>
<tr>
<td></td>
<td>Foreign Insurers</td>
</tr>
<tr>
<td>b) Free country</td>
<td>b) Dominant Sector -</td>
</tr>
<tr>
<td></td>
<td>Domestic</td>
</tr>
<tr>
<td><strong>P_r Political Situation</strong></td>
<td>Market Growth $D_r + I_r$</td>
</tr>
<tr>
<td>a) Stable</td>
<td>a) Conducive for</td>
</tr>
<tr>
<td></td>
<td>Growth of business</td>
</tr>
<tr>
<td></td>
<td>and Investment</td>
</tr>
<tr>
<td>b) Unstable</td>
<td>b) Unfavourable for</td>
</tr>
<tr>
<td></td>
<td>Growth and</td>
</tr>
<tr>
<td></td>
<td>Investment</td>
</tr>
<tr>
<td><strong>E_r Economic Environment</strong></td>
<td>Market Statutory control</td>
</tr>
<tr>
<td>of Market</td>
<td>a) Nationalised Industry or Stiff Statutory Control on limited Free Market</td>
</tr>
<tr>
<td>a) State Control of Economy</td>
<td></td>
</tr>
<tr>
<td>b) Liberal Economy</td>
<td>b) Unlimited Free Market or Relatively limited Statutory Control</td>
</tr>
<tr>
<td>Sr Social Environment of Market</td>
<td>Sr Social Norm of Insurance</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>a) Advanced Welfare State</td>
<td>a) i) Liability insurance Sector - Significant</td>
</tr>
<tr>
<td></td>
<td>ii) Developed Personal Insurance Schemes</td>
</tr>
<tr>
<td>b) Marginal Welfare State</td>
<td>b) i) Insignificant Liability Insurance Sector</td>
</tr>
<tr>
<td></td>
<td>ii) Developing Personal Insurance Sector</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T_r Technological Environment</th>
<th>T_r Technological Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Advanced Technology</td>
<td>a) Predominant progress of Non-conventional policy covers for High Tech Sector</td>
</tr>
<tr>
<td>b) High literacy</td>
<td>b) i) Availability of Trained Manpower</td>
</tr>
<tr>
<td></td>
<td>ii) High Cost of Salaries for Trained Manpower.</td>
</tr>
</tbody>
</table>
c) Advanced Network of Communication infrastructure
c) i) Technology intensive Management
ii) Direct sales techniques with use of Network of communication.
d) Developing Technology d) Predominant conventional policies for Developing Industries and Commercial Sector Th.10162-
e) Low/Medium % Literacy e) Shortage of trained manpower
f) Developing stage of Network of Communication f) i) Manpower intensive management
ii) Agency network for sales
iii) Low cost of personnel salaries.
These illustrations are merely for demonstration of Law of Linkage between Macro Environment and General Insurance Market Norm. The inter-relations are by no means limited to pointed factors and there are complex simultaneous interactions between all environment vectors and market operational factors. It is therefore not possible to derive precise Mathematical Formula interconnecting Macro Environment $\Sigma E_r$ with Insurance Market Norm $\Sigma M_r$ but we can formulate a broad Matrix to symbolize the problem of inter-relation in following terms:

\[
\begin{align*}
& ME_r & GI_r \\
1. & \{P_r+E_r+S_r+T_r\}x\{ST_r+SR_r+F_r+D_r+M_r+T_r+S_r+I_r\} - \text{Individual Case} \\
& r=n \\
2. & \sum_{r=1}^{n} \{P_r+E_r+S_r+T_r\}x\sum_{r=1}^{n} \{ST_r+SR_r+F_r+D_r+M_r+T_r+S_r+I_r\} - \text{Global Scenario} \\
& r=1 \\
\end{align*}
\]

$n = \text{Total population of member countries}$

$n = 1, 2, 3... \text{ For simplified case. Developed - Communist - Developing sectors.}$
II) MODEL TECHNOLOGY DEMONSTRATING LAW OF LINKAGE BETWEEN MACRO ENVIRONMENT AND GENERAL INSURANCE BUSINESS

For demonstrating the inter-relation between Macro Environment and General Insurance Industry following models have been designed:

1. Hydro-Dynamic Model

Technique in the construction of Hydraulic Power Stations of linking main reservoir of water storage with surge chamber is used in this design for demonstrating use of General Insurance Industry to Monitor trends in Macro Environment. Figure 2.1 shows functioning of this model. Tank A represents Reservoir of Community Wealth (Gross Domestic Product) produced through simultaneous functioning of vectors of political, socio-economic, technological activities of community. By arranging regulated outgo of percentage of this wealth through premium conduit, part of this wealth is continuously stored in the chamber of General Insurance Industry, to reimburse partially Financial losses of community arising from some accidental ruptures, defined as insured perils, in Environment Reservoir like
failures of Technical or Human system or Natural catastrophes. If through co-ordination amidst all sectors of community activity there is steady accumulation of wealth in reservoir of environment, there is also steady growth in premium reserve in safety chamber of Insurance inspite of losses from time to time in the main chamber and its reimbursement, albeit partial by payment of claims by Insurance Industry. If however, there is intense turbulence in production system of environment reservoir, it will be reflected in high surge of claims in safety chamber of insurance system. Like the hydro-dynamic model, surges in safety chamber will be useful for steadying the turbulence in main reservoir provided steps are taken promptly to check the distortions in system causing turmoil. General Insurance Industry's operation in any market serves to give sensitive indication of environment trends of that country.

2. Balloon Model

Balloon Model shows effectively exposure of General Insurance Industry to Environmental factors. Figure 2.2 shows that the scope for the development of Insurance Business depends upon the conducive or
adverse impact of external environment factors. If industry grows at rate proportional to the growth of potentiality available under environment restrains, it will achieve rhythmic development on sound basis. If on the contrary, the growth rate is excessive in relation to available potentiality under environment restrains, it will burst under Financial Social Strains. As against this situation, if Industry fails to register growth commensurate with available potentiality, it will not expand to the optimum level. The lessons learnt during blissful childhood should not be forgotten by insurance executives in charge of development of business in dynamic environment. Balloon Model (Figure 2.3) shows how constituent factors of operational equation of Industry: Operational Profit = (Premium + Investment Income) - (Expenses + Claims), are sensitive to political, economic, social, technological vectors of external environment.

3. Universe Model

Figure 2.4 shows Universe Model which is useful in showing simultaneous inter-relation between Environment Factors and reactive growth rates of all units of Financial Sector like Banking, Mutual
Funds, Stock Market, Life Insurance and General Insurance, which depend for input on generation of community savings. Like our cosmic system bound by periphery of expanding universe, harmony within orbits of constituent members is vitally important for its smooth functioning. If at a future distant date the balance preserved in the cosmic system for billions of years is lost due to some unpredictable cause, there is certainty of total disaster either through instantaneous big bang or prolonged gradual suction into black-hole of zero entropy. Model in Figure 2.4 indicates similar fate for our Human Society's system constituted of Financial planets-stars moving in orbits within boundary of Macro Environment.

4. **Model for Insurability of Risks/Model for General Insurance Market:**

Economist Berliner Baruch of Swiss Re has designed Model for defining 'Limits of Insurability' based upon following eight characteristics:

1. Randomness
2. Maximum Possible Loss
3. Average Loss amount per occurrence
4. Average period of time between loss occurrences
5. Insurance premium
6. Moral Hazard
7. Public Policy
8. Legal restrictions and
9. Cover limits

Risks falling within the stipulated limits of above characteristics will be insurable. The rest will fall either in gray zone or outside insurable zone as shown in Figure 2.5. Extending this concept, it is possible to define conventional insurance sector of Primary Insurance market as Insurers underwriting only conventionally insurable risks as defined above. Their category can be further restricted to exclude Insurance systems of (1) Pools, (2) Captives (3) Mutuals (4) Self Insurance (5) Risk Retention arrangements (6) Purchase Groups, etc. These excluded arrangements will form non-conventional sector of primary insurance market. At the apex level of Market, business from primary conventional and non-conventional sectors becomes part of Global Reinsurance market. Figure 2.6 gives the Model for General Insurance Industry constituted of conventional and non-conventional sectors of primary insurance and secondary reinsurance sectors.
5. Dynamic Model for General Insurance Industry

The model which demonstrates the theme of this thesis of 'Transformation of General Insurance Industry' is given in Figure 2.7. Table in this figure shows changing norm of General Insurance Industry to meet on the one hand developing needs of society with changing Macro Environment and on the other, to preserve Industry's operational, financial, commercial feasibility. Since Environment Model and General Insurance Model are multi-dimensional, the model can be at best shown symbolically on three axes - graphic representation. The table giving correlation within Time, Environment and Industry co-ordinates, is self-explanatory.

III) THE LAW OF LINKAGE BETWEEN MACRO ENVIRONMENT AND GENERAL INSURANCE NORM

The hypothesis of this Research Thesis can be defined as the Law of Linkage between Macro Environment and General Insurance Norm. It stipulates that transformation of General Insurance takes place in tandem with transformation of Macro Environment to provide adequacy of insurance cover to meet the demands of Society in the new Macro Environment.
Mathematical Matrix symbolising the Law of Linkage defined above can be represented as follows:

Transformation of Macro Environment and General Insurance Norms for Markets in Global population of General Insurance Units

<table>
<thead>
<tr>
<th>Time</th>
<th>Macro Environment Norm</th>
<th>General Insurance Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>MEₜ₁</td>
<td>GIₜ₁</td>
</tr>
<tr>
<td>T₂</td>
<td>MEₜ₂</td>
<td>GIₜ₂</td>
</tr>
<tr>
<td>T₃</td>
<td>MEₜ₃</td>
<td>GIₜ₃</td>
</tr>
<tr>
<td>Tₙ</td>
<td>MEₙₙ</td>
<td>GIₙₙ</td>
</tr>
</tbody>
</table>

Summation of changes for all markets in Global population is taken from \( r = 1 \ldots n \): Graphical representation of this Law of Linkage is given in Figure 2.8.

For testing the hypothesis symbolised by the Law of Linkage historical review of development of General Insurance Industry will be now taken in Chapter III of the thesis.
FIGURE 2.1

HYDRO-DYNAMIC MODEL OF INTER-RELATION BETWEEN
MACRO ENVIRONMENT AND MICRO INSURANCE SECTOR

ENVIRONMENT

RESERVOIR

CLAIMS

GENERAL INSURANCE SURGE CHAMBER

LOSSES THROUGH RUPTURE BY FAILURES OF TECHNOLOGICAL OR HUMAN SYSTEMS OR NATURAL HAZARDS.

PREMIUM
FIGURE 2.2

BALLOON MODEL

ENVIRONMENTAL RESTRAINTS ON
GENERAL INSURANCE PORTFOLIO

OPERATIONAL ENVIRONMENT IN THE DECADE OF NINETIES

POLITICAL

INTERNATIONAL

SOCIAL

GENERAL INSURANCE BUSINESS

MANAGEMENT

TECHNOLOGICAL

ECONOMIC
FIGURE 2.3

IMPACT OF ENVIRONMENT ON
OPERATION OF INSURANCE MARKET

INFLATION

PREMIUM

CONSUMERS’ PRESSURE

COMPETITION

GOVT. REGULATION

EXPENSES

LABOUR LEGISLATION

SOCIO-ECONOMIC FACTORS

AUTOMATION OF SYSTEMS

INFLATION

CLAIMS

ESCALATION OF VALUES

ESCALATION OF LIABILITIES

-VE EFFECT RISK DETERIORATION

INFLATION

ESCALATION OF FREQUENCY

INVESTMENT

RISE DIVIDENDS

RISING INTEREST RATES

INTERNATIONAL ENVIRONMENT

CURRENCY APPRECIATION

RECESSON

CURRENCY DEVALUATION

+VE EFFECTIVE RISK MGMT.
FIGURE 2.4

UNIVERSAL MODEL OF FINANCIAL SECTOR
WITHIN MACRO ENVIRONMENT BOUNDARY

BURST THROUGH EXCESSIVE EXPANSION
GROWTH IN HARMONY
SUCTION IN BLACKHOLE ZERO ENTROPY
FIGURE 2.5

MODEL OF LIMITS OF INSURABILITY AND GENERAL INSURANCE MARKET

MACRO ENVIRONMENT

INSURABILITY ZONE
GRAY ZONE
BEYOND INSURABILITY ZONE LIMITS
FIGURE 2.6

MODEL OF LIMITS OF INSURABILITY AND GENERAL INSURANCE MARKET

MACRO ENVIRONMENT

POLITICAL VECTOR

TOTAL GENERAL INSURANCE INDUSTRY

APEX REINSURANCE

ECONOMIC VECTOR

SOCIAL VECTOR

CONVENTIONAL INDUSTRY

TECHNOLOGICAL VECTOR
Movement of Industry Norm shows Trend from Conventional to Non-Conventional Form...
FIGURE 2.8

DYNAMIC MODEL OF GENERAL INSURANCE INDUSTRY

<table>
<thead>
<tr>
<th>TIME</th>
<th>ENVIRONMENT</th>
<th>INDUSTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>E₁</td>
<td>I₁</td>
</tr>
<tr>
<td>1850</td>
<td>E₂</td>
<td>I₂</td>
</tr>
<tr>
<td>1900</td>
<td>E₃</td>
<td>I₃</td>
</tr>
<tr>
<td>1950</td>
<td>E₄</td>
<td>I₄</td>
</tr>
<tr>
<td>1975</td>
<td>E₅</td>
<td>I₅</td>
</tr>
<tr>
<td>1990</td>
<td>E₆</td>
<td>I₆</td>
</tr>
<tr>
<td>2000</td>
<td>E₇</td>
<td>I₇</td>
</tr>
</tbody>
</table>

NON. CONV

INDUSTRY NORM

TREND

CONV.

1800  TIME  2000