

A Study of Organizational Attitude Towards Risk and its Impact on Crisis Preparedness Among Malaysian Manufacturers

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ABSTRACT

The organizational crisis preparedness includes three components, namely signal detection, prevention and recovery mechanism. Based on the Protection and Motivation Theory (Maddux & Rogers, 1983), a study was conducted among Malaysian manufacturing organizations listed in the Federation Malaysian Manufacturing Directory, 2003. Regression analyses on a sample of 106 organizations showed that organizational perception of risk was negatively correlated with organizational crisis preparedness. Findings and implications for managerial practice are discussed.

Introduction

Malaysia, one of the world's top trading nations, must acknowledge the price it pays for rapid industrialization. It is about time that Malaysia realized as well as find remedy for the potential damaging side effects of industrial activities. In fact, Shrivastava, Mitroff and Miglani (1988) aptly stated that organizations are simultaneously system of production and destruction. Despite stringent laws and regulations governing industrial activities in Malaysia, it does not suffice if organizational attitude towards risk and crisis remains the same as it was during the pre-industrialized days.

Over the past decade, overseas scholars and researchers have given much attention in investigating the factors that determined crisis prone and crisis prepared organizations (Booth, 1993; Fink, 1986; Heath, 1998; Reilly 1987; 1989, Zdziarski, 2001). Specifically, empirical studies by Fink (1986), Booth (1993), Chong and Nyau (2002) concentrated on organizational structures that support or otherwise do not support crisis management. These studies mainly examined the existence of formal crisis plan and crisis team in the organizations as determinant of crisis preparedness. However, Pearson and Clair (1998) did a conceptual study that proposed looking into organizational perception and attitude towards risk as a factor that may determine beliefs in the organization about the value and need for crisis management. But there was no empirical evidence to confirm or reject Pearson and Clair's (1998) proposition. To add to these, empirical study by Mitroff, Pearson and Harrington (1996) suggested measures to determine crisis prone and crisis prepared organizations. Local studies by Shaluf, Ahmadun, Mat, Mustapha and Shariff (2002) developed model to depict preconditions of technological man-made disaster in Malaysia. Based on all these studies, this research seeks to examine the impact of organizational perception of risk, as proposed by Pearson and Clair (1998) on organizational crisis preparedness; using measures proposed by Mitroff et al. (1996).

Review of Literature

Organizational Crisis Preparedness

According to Mitroff and Anagnos (2000), Mitroff et al. (1996) and Zdziarski (2001), crisis preparedness was crisis preparedness is still lacking during disasters compared to possibilities of crisis that could befall an organization. defined as the capability to (1) anticipate, (2) prevent, (3) contain, (4) recover and (5) learn from crisis experience.

Mitroff and Pearson (1993) suggested that crisis-prepared organizations did not consider crisis management as a cost of doing business; rather, they viewed it as a strategic necessity that provided a number of competitive advantages. Executives in crisis-prepared organizations considered their firms not only as productive systems but also as potentially destructive systems. They have developed the ability to imagine the worst, the unthinkable, and the unspeakable, as a way of doing everything possible to prevent such events. They have indeed acknowledged the fact that crisis is inevitable.

Perception of Risk and Organizational Crisis Preparedness

Literatures indicated that organizational preparedness started with executive's perception of risk and risk-taking (Paton, 2003; Pauchant & Mitroff, 1992; Pearson & Clair, 1998; Vries & Miller, 1986). Perceptions of senior executives determined beliefs in the organization about the value and need of crisis management (Chong & Nyau, 2002; Mitroff & Alpaslan, 2003; Mitroff & Anagnos, 2000; Pauchant & Mitroff, 1992; Wisenblit, 1989). From the psychological perspective, the Protection Motivation Theory by Maddux and Rogers (1983) assumed that those who perceived themselves to be at risk will engage in preventive responses if they believed that certain responses were available to mitigate potential damage. According to the cognitive psychological perspective:

Some people see potential crises arising and others do not; some understand technological and social changes and others do not. What people can see, predict, and understand depends on their cognitive structures, by which we mean logically integrated and mutually reinforcing systems of beliefs and values. Not only do top manager's cognitive structures shape their actions, they strongly influence their organization's actions (Nystrom & Starbuck, 1984: 64).

Thus, if an executive's cognitive structures did not allow him or her to acknowledge the organization's susceptibility to risk and crisis, preparations will be less likely. There was a fundamental paradox suggested in connection to crisis management:

The less vulnerable an organization thinks it is, the fewer crises it prepares for; as a result, the more vulnerable it becomes. Conversely, the more vulnerable an organization thinks it is, the more crises it prepares for; as a result, the less vulnerable it is likely to be (Mitroff et al., 1987:285).

The tragic explosions of space shuttles, Challenger and Columbia should be enough to dispel any doubts about the validity of this paradox. Knowing potential vulnerabilities allows planning and organizing. The end product should be those unpredictable everyday minor crises do not escalate to become disasters (Davies & Walters, 1998).

An organization that perceived itself as immune to crises will not allocate resources for that potential and will therefore experience "surprises" due to lack of anticipation and awareness (Hermann, 1963; Mitroff & Pearson, 1993). An organization that felt threatened will feel

more vulnerable to losses and, therefore, may be more prepared to reduce its vulnerability (Gabor & Pelanda, 1983; Pearson & Clair, 1998; Slovic, 2000). Therefore the first hypothesis developed in the present investigation is:

H1.a Perception of possible loss is positively related to Organizational crisis preparedness.

According to Dickson (1987), measurement of likelihood of loss was an important aspect of the analysis of risk. Probability theory sets out to attach a numerical value to the measurement of the likelihood of an event occurring. This probability figure must be between “0” and “1”. A probability of “0” implied that the event was impossible; while a figure of “1” showed that it was certain to occur. Clearly there were few, if any, events which were either impossible or certain and most events therefore have a probability which lies between these two extremes.

Bannister and Bawcutt (1978) also suggested measurement of risk was necessary as it provided assistance in practical decision taking about risk, such as engaging in a business activity and deciding the extent of adopting risk control measure. According to Bannister and Bawcutt (1978), to measure risk, we look at 2 dimensions of risk; first, risk frequency, the other, risk severity and finally relationship between frequency and severity.

Like Dickson (1987), Ansell and Wharton (1992) and Bannister and Bawcutt (1978) also operationalized assessment of perceived risk based on estimates of the probability of outcomes and the magnitude of the outcomes. These were not observable measures; they were the result of evaluative judgments. In practice there was a tendency to exclude low probability outcomes on the basis that they were ‘remote’ possibilities which can be ignored ‘for practical purposes’. They were in effect accorded an ‘effectively zero’ probability. But the introduction of the concept of the ‘effectively zero’ possibility brought about the question of how low a probability needed to be for it to be considered negligible. It was, therefore, necessary that to include low probability outcomes will depend on the estimated value of potential losses. Clearly, if the potential outcome was a possible disaster or catastrophe, which threatened the very existence of the organization, then it cannot be ignored, no matter how low the possible value of loss may be (Ansell & Wharton, 1992). With regards to the relationship between frequency and severity, Bannister and Bawcutt (1978) suggested that there will be more frequent minor losses, less frequent serious losses and least frequent rare and

catastrophic losses. It was, therefore, the executives that will determine the responses to these probabilities of losses based on their subjective perception of risk which represented their perceived threat based on potential value of possible loss. Therefore, the next hypothesis put forth in the study is:

H1.b Perception of value of possible loss is positively related to organizational crisis preparedness

Theoretical Framework

Conceptualization of Variables

Perception of Risk

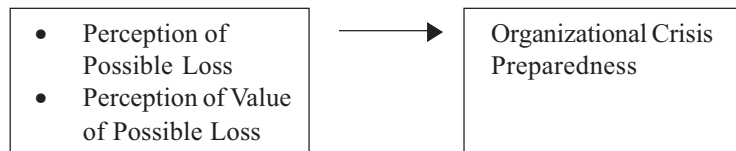


Figure 1: Research Framework

Based on the discussion in the literature review section, the criterion variable in this study is Organizational crisis preparedness. The predictor variable is Perception of risk. The relationship between the study variables are depicted in Figure 1.

Methodology

Subjects, Procedure and Measurement

This study was conducted in all states in Malaysia. All manufacturing organizations listed in the Federation of Malaysian Manufacturing (FMM) Directory (2003) with 40 or more employees have an equal chance of being selected. The reason for selecting organizations with 40 or more employees was to reduce bias by ensuring that all organizations that responded to this study have a safety committee as required by Safety and Health Regulation 1996. Since there are about 1500 manufacturing organizations listed in the FMM directory (2003), a simple random sampling is used to select respondents. The respondents were any of the following;

chief executive officers, human resource managers, risk or crisis managers, safety, health and environment managers or senior management staff. Since the unit of analysis was the organization, this study seeks responses from the management staff which were representative of the organization.

The predictor variable is perception of risk which is based on two dimensions, namely, perception of possible loss and perception of value of possible loss. Items for these variables were self-constructed and responses were made on a 7 point Likert scale. For the first dimension, the 7 point Likert scale is based on 1= no chance to 7=very great chance. The second dimension is also on 7 point Likert scale with 1=nil and 7=very great. The criterion variable is the Organizational crisis preparedness. The items were adapted from measurements proposed by Mitroff et al. (1996). Responses to the items were made on a 7-point Likert scale (1=strongly disagree to 7=strongly agree).

Method of Analysis

Studies by Chong and Nyau (2002), Reilly (1989) and Wisenblit (1989), Reilly (1987), Shaluf et al (2002), Chaong and Nyau (2002) found that organizational size, organizational age, hazard category and organizational ownership were associated with higher ratings to manage crisis. Thus, this study statistically controlled for these variables. In the present investigation, the hypotheses were tested using hierarchical regression.

Results

Profile of Respondents

The total numbers of respondents were 106 and the demographic characteristics were shown in Table 1. The respondents comprised of 14% females and 86% males. This gender bias in terms of percentage representation was indicative of normal gender distribution for senior management staff in Malaysian organizations. In terms of age distribution, 84% of the respondents were between the age of 31 and 50 years. This was to be expected as the respondents were senior management employees who had normally gone through tertiary education and/or had many years of working experience. With regards to the highest educational attainment, 76% of respondents were Degree holders, whilst only 17%

and 5% were Diploma and SPM holders respectively. Hence, it was safe to assume (in this study sample) that the majority of the senior management employees were highly educated and only handful were perhaps rank and file.

Table 1: Profile of Respondents

Demographic Variables	Category	Frequency (n = 106)	Percentage
Gender	Male	91	85.8
	Female	15	14.2
Age (in years)	21-30	5	4.7
	31-40	51	48.1
	41-50	38	35.8
	51-60	12	11.3
Designation	CEO/ED	11	10.6
	General Manager	17	16.3
	Senior Manager	59	56.7
	Executive	17	16.3
Rank	Top Management	45	42.5
	Middle Mgt.	61	57.5
Educational Attainment	SPM/MCE	7	6.6
	STPM/HSC	0	0
	Diploma	18	17.0
	Bachelor's Degree	67	63.2
	Master's/ PhD	14	13.2

Looking at the distribution, based on respondents' designation in the organization, it was also not surprising that 55% were senior management employee, whilst only 10% and 16% were Executive Director/CEO and General Manager respectively. A thorough check on the questionnaires brought to light that most respondents were production managers/directors who were more familiar with the procedures and rulings on Safety, Health and Environmental issue.

Profile of Organizations

As shown in Table 2, the industrial sectors within this study samples were not evenly distributed. The Electrical and Electronics industry made up the majority sector, which was 30% of the total study samples, whilst 10% and 9% were from the Oil and Gas, and the Chemical industries respectively. The Automobile and the Food/Drink industries

made up 6% and 8% respectively of the total sample. The remaining 36% comprised of organizations that did not come under any of the above categories.

Table 2: Profile of Organizations

Demographic Variables	Category	Frequency (n = 106)	Percentage
Industrial Sector	Oil and Gas	10	9.4
	Chemical	11	10.4
	Electrical/Electronic	32	30.2
	Auto Parts	6	5.7
	Food/Drinks	8	7.5
	Others	39	36.8
Degree of Hazard	Hazardous	26	24.5
	Non-Hazardous	80	75.5
Ownership	100% Foreign	30	28.31
	100% Malaysian	42	39.6
	50-50 Joint Venture	2	1.9
	Foreign Majority	16	15.1
	Malaysian Majority	16	15.1
No. of Employees	40-100	14	13.2
	101-200	17	16.0
	201-500	28	26.4
	501-1000	19	17.9
	Above 1000	28	26.4
Years in Business	1-5 yrs	6	5.7
	6-10yrs	21	19.8
	11-15yrs	25	23.6
	16-20yrs	15	14.2
	Above 20 yrs	39	36.8

In terms of ownership of the organizations, the majority comprised of 100% Malaysian owned organizations (40%), followed by 100% Foreign owned organizations (28%). The remaining 32% were Foreign and Malaysian joint ownership organizations. As shown, 51% had operated the businesses for more than 15 years, whilst 44% had operated the businesses for over 5 years. Only 5% were young organizations that had been in the businesses between 1 to 5 years.

In line with the distribution based on industrial sector, it was not surprising that only 25% of these organizations were considered major hazard organization that were subjected to the CIMAH (Control of Industrial Major Accident Hazards) Regulations 1996. This was added

information that may be useful in further analyses to see if organizations that were subjected to CIMAH regulation 1996 responded differently from other organizations in this study.

Hence, the majority of the organizations were mature organizations that may be better able to respond to this study. It was also worth noting that the majority of the organizations had employees exceeding 500 people (44%). With regards to the sales/ turnover, about 62% had sales between RM10mil to RM200mil per year. Whether organizational size, organizational ownership, years the organizations were in business and hazard category formed any pattern in the findings result has yet to be known in further analysis.

Factor Analyses of Study Variables

Perception of Risk

Principal component factor analyses were performed separately for each variable. This is to validate whether the dimensionality of the independent and dependent variables are distinct. In interpreting the factors, only loading of .50 or greater on one factor and 0.35 or lower on the other factor are considered (Igbaria et al., 1995).

Perception of Possible Loss.

Factor analysis on the 18 items yielded 2 factors, ranging from .59 to .89. These factors cumulatively captured 57.55% of the variance in the data. The Kaiser-Meyer-Olkin (KMO) value was .86, which was higher than the recommended value of .60. The Measure of Sampling Adequacy (MSA) and Bartlett Test of Sphericity reached statistical significance, thus supporting the factorability of the correlation matrix (Coakes & Steed, 2001). However, two items were dropped from the analysis due to low factor loadings (less than .50) and low communality (less than .40). The reliability (Cronbach Alpha) for factor 1 and 2 were .92 and .81 respectively, which were considered acceptable. The first factor was dominated by questions relating to abnormal risks. Accordingly, the factor was named "Perception of Loss due to Abnormal Risk". The second factor was dominated by questions relating to normal risk; hence, this factor was named "Perception of Loss due to Normal Risk".

This was in line with earlier studies by Mitroff and Pearson (1993), Pauchant and Douville (1994), and Pearson and Clair (1998) that risks were basically categorized into normal and abnormal risk. In this study, abnormal risks were rare happenings and these included risks that resulted

from deliberate human action or inaction. Besides being human induced, abnormal risks also included natural disaster that may lead to catastrophic losses. Normal risks on the other hand referred to day to day risk that all manufacturing businesses were exposed to, but may result in disaster if losses were not controlled or isolated. This included operator error, plant/equipment defect, product defects and the like.

Perception of Value of Possible Loss

Similarly another factor analysis was also undertaken to examine the dimensionality of another component, Perception of Value of Possible Loss. All eighteen items were used to measure the Perceived Value of Possible Loss. Factor analysis on these items yielded 2 factors ranging from .64 to .94. All of the 18 items showed acceptable Measures of Sampling Adequacy values of above .50. The Kaiser-Meyer-Olkin value for the items was .93 and the Bartlett's Tests of Sphericity was significant. The Percentage of Total Variance Explained was 73.97%. Perception of Value of Possible Loss yielded two factors. Two items were dropped from further analysis due to low factor loadings (less than .50). The reliabilities for first and second factors were .97 and .89 respectively. The common thread across the first factor reflected "Perception of Value of Possible Loss due to Abnormal Risk" and the second factor reflect "Perception of Value of Possible Loss due to Normal Risk". As such these factors were named accordingly.

Organizational Crisis Preparedness

Factor analysis was also conducted to examine the dimensionality of the dependent variable, Organizational Crisis Preparedness. This study used the indicators identified in studies by Mitroff and Pearson (1993). They proposed four dimensions of crisis preparedness, namely, signal detection, prevention, damage control and recovery mechanism. Factor analysis on organizational crisis preparedness resulted in 3 factors with factor loadings ranging from .50 to .90. The KMO Measure of Sampling Adequacy (MSA) was .91, whilst the Bartlett's Test of Sphericity was significant. The first factor was dominated by questions pertaining to "Prevention Mechanism", the second factor was dominated by questions pertaining to "Recovery Mechanism" and the third factor was dominated by questions pertaining to "Signal Detection Mechanism". Even though 4 factors were suggested in previous studies, 3 factors emerged and it looked like "Damage Control Mechanism" was subsumed under

“Prevention Mechanism”. This may be due to the fact that perhaps our Malaysian organizations did not see prevention and damage control mechanism as two separate mechanisms and hence considered both mechanisms as similar. The total variances explained jointly by these three factors were 67.70%. Finally, the Second-Order factor analysis was conducted. The result showed that one factor emerged with factor loading ranging from .80 to .91. This factor captured 75.43% of the variance in the data and it was named Organizational Crisis Preparedness. The Cronbach Alpha was .83, the Measure of Sampling Adequacy was .69 and Bartlett’s Test of Sphericity was significant. The second order factor analysis was conducted to gauge the crisis preparedness of the organizations in the study sample.

As a result, new variables were created after factor analyses, new hypotheses were constructed which were referred to throughout this study from this point onwards (Table 3).

Restatement of Hypotheses

Table 3: Restated Hypotheses

Hypothesis	
H1	There is a positive relationship between perception of risk and organizational crisis preparedness.
H1(a)	There is a positive relationship between perception of possible loss due to abnormal risk and the organizational crisis preparedness.
H1(b)	There is a positive relationship between perception of possible loss due to normal risk and the organizational crisis preparedness.
H1(c)	There is a positive relationship between perceived value of possible loss due to abnormal risk and the organizational crisis preparedness.
H1(d)	There is a positive relationship between perceived value of possible loss due to normal risk and the organizational crisis preparedness.

Descriptive Statistics

To acquire a feel for data, descriptive statistics such as the frequency distributions, maximum, minimum, mean and standard deviation on all independent and dependent variables were obtained. Table 4 displayed the results of the descriptive analysis.

Table 4: Descriptive Statistics of Study Variables

Variables	N	Minimum	Maximum	Mean	Standard Deviation
Perceived Possibility of Abnormal Loss	106	1.17	6.33	2.70	.90
Perceived Possibility of Normal Loss	106	1.25	6.00	3.09	1.04
Perceived Value of Abnormal Loss	106	1.00	7.00	4.35	1.51
Perceived Value of Normal Loss	106	1.25	7.00	4.70	1.42
Organizational Crisis Preparedness	106	2.33	6.81	5.25	.97

The results in Table 4 indicated that the mean of all variables were between 2.70 and 5.43. This indicated that there were no extreme values for the mean. The standard deviations showed variations in the data for identification of patterns of interrelationship among variables.

In general, the management of manufacturing organizations believed that losses due to normal and abnormal risk (as specified in the study) were highly unlikely. They even perceived that if those risks were realized, the value of loss to the organization were moderate. This provided indication that organizations believed that they were invulnerable to losses. The same result was found in studies done in the late 1980's in the United States on Fortune 500 organizations in United States (Mitroff et al., 1989). Despite denying vulnerability to crisis, these organizations believed that they were ready to handle crisis situation. Generally, these results were based on the mean score of all study variables. Though these results gave an overall picture of the findings, there were variations in scores between organizations, based on their demographic characteristics. Hence, further statistical analyses were required to provide a complete and clearer understanding of this study.

Intercorrelations between Variables

Correlation analysis provided an initial picture of the interrelationships among the variables of interest. In this study, the Pearson Product-Moment correlation coefficient (r) was used. Table 5 provided initial indication that there was significant but negative relationship between perception of loss due to abnormal risk and overall crisis preparedness. On the other hand, there were low correlation between the other variables of perception of risk and the organizational crisis preparedness. Even then, further statistical tests were required to understand in greater detail.

Table 5: Correlations between Variables

	mp1	mp2	mv1	mv2	ocp
mp1	1.00				
mp2	.43***	1.00			
mv1	.29**	.05	1.00		
mv2	.09	.13	.76***	1.00	
ocp	-.34***	-.17	.08	.06	1.00

Note. ***significant at .01 **significant at .05

- mp1: Perception of Possible Loss due to Abnormal risk (IV)
- mp2: Perception of Possible of Loss due to Normal Risk (IV)
- mv1: Perception of Value of Possible Loss due to Abnormal Risk (IV)
- mv2: Perception of Value of Possible Loss due to Normal Risk (IV)
- ocp: Organizational Crisis Preparedness (DV)

Regression Analysis

Table 6 presents the results of the hierarchical regression analysis. To test for the hypotheses, the Perception of possible loss and Perception of value of possible loss were regressed on to the Organizational crisis preparedness.

Table 6: Results of Regression analysis: Impact of Perception of risk and Organizational crisis preparedness

	Model 1	Model 2
	Standardized Beta	
Control Variables:		
Years in business	.08	.15
Organizational ownership	.29***	.20*
Size of organization	-.01	.02
Hazard Category	.23*	.24*
Model variables:		
Perception of loss due to abnormal risk	-.40**	
Perception of loss due to normal risk	.01	
Perception of value of loss due to abnormal risk	.22	
Perception of value of loss due to normal risk	-.11	
R ²	.15	.28
Adjusted R ²	.11	.21
R ² Change	.15	.13
F Change	4.33*	4.22*

Note *** significant at .01 *significant at .05

Dummy coded variables: Hazard category: 0=non hazardous org.; 1=hazardous org.; Size of org: 0=500 employees and below; 1=above 500 employees; Ownership category: 0=50%-100% Malaysian ownership; 1=100% foreign ownership and foreign majority, Years in business: 0=15 yrs and below; 1=above 15 years.

Model 1 showed regression analysis with the control variables of years in business, organizational ownership, organizational size and hazard category on the dependent variable, overall crisis preparedness. The model was significant with $R^2 = .15$, Adjusted $R^2 = .11$ and the F Value = 4.33. Upon examining the individual control variables, it was found that the organizational ownership contributed significantly to this model, with $b = .29$ ($p < .01$). The other significant variable was hazard category with $b = .23$ ($p < .05$). As such, it was obvious that organizational ownership and hazard category were significant contributors to the dependent variable, organizational crisis preparedness.

In Model 2, the independent variables were included in the model together with all the control variables. This model provided evidence of direct relationship between independent and dependent variables after statistically controlling for the four demographic variables. The model improved significantly with $R^2 = .28$, Adjusted $R^2 = .21$, R^2 Change = .13 and F Change = 4.22. Perception of possible loss due to abnormal risk was significant with $b = -.40$ ($p < .01$). However, this variable was negatively correlated.

Discussions

This study hypothesizes that organizational perception of risk will have direct positive relationship with organizational crisis preparedness. However, contrary to what is hypothesized, this study shows a negative relationship between perception of possible loss due to abnormal risk and organizational crisis preparedness and insignificant relationship between perceived value of possible loss and organizational crisis preparedness. These contradict what we see as natural for organizations with low perception of risk to allocate little resources to prepare for crisis potential and visa versa. This negative relationship provides evidence that Malaysian manufacturing organizations perceived invulnerability to risk because they believe that they are moderately crisis prepared. Studies conducted in countries such as Hong Kong by Chong and Nyau (2002), United States of America by Finks (1986) and United Kingdom by

Wisnblit (1989) provided evidences of inconsistency between agreeing on inevitability of crisis and having crisis plan which may help to explain this phenomenon. Their studies found that more than 80% of the organizations agree that crisis is inevitable but less than 50% of the organizations have crisis plan. Likewise, this study also provides evidence of inconsistencies. This study found that even though Malaysian manufacturing organizations basically deny vulnerability to crisis; they believed that they are quite crisis prepared. This is based on the mean scores of the four dimensions of perception of risk which ranges from 2.70 to 4.70. Perception of possible loss has the lowest mean score (2.70 and 3.09). This basically is translated into “disagree” and “slightly disagree” (base on a 7 point-likert scale from (1) strongly disagree to (7) strongly agree) that a loss may happen. It can therefore be concluded that Malaysian manufacturing organizations basically deny vulnerability to losses possibly because they think they are quite crisis prepared. The mean scores on crisis preparedness range from 5.00 to 5.40 which translate to “slightly agreeing” and “agreeing” that they are crisis prepared. This result support Mitroff et al. (1996) argument that executives and managers can develop too much faith (and a false sense of security) in their abilities to prevent dangers when some level of crisis preparation is adopted. This may bring us back to the Titanic disaster (1912) when perception persists that the Titanic was “unsinkable” as she was considered absolutely safe. To add to this Pearson and Clair (1998) argues that “limited preparation actually may reinforce assumptions of invulnerability” (p. 70).

To further substantiate this finding, it is worth recalling the Sungai Buloh Bright Sparklers fire and explosion in 1991. This is a classic case of a Malaysian manufacturing organization that refuses to learn from previous mistakes and underestimate their risk and vulnerability to crisis. There were four separate fatal accidents that happened since 1978 before the tragedy that left 103 people dead in 1991. This organization did not heed the warnings that brought about the tragedy after accumulation of errors in a period estimated to be 16 years (Shaluf et al., 2002). Now, 14 years after this dreadful tragedy, and many more recent tragedies such as fire and explosion at Sultan Abdul Aziz International Airport (1991), Malaysian oil and gas refinery explosion (1997), fatal accident in Proton Shah Alam manufacturing plant (2002) and the recent gas leakage at Knowles Electronic Industry in Penang (2005), Malaysian manufacturing organizations still deny vulnerability to risk and crisis. Disasters that have happened over the years in Malaysia and worldwide are perhaps considered

rare happenings and isolated cases. As discussed earlier, the minimal level of organizational crisis preparedness required by Malaysian regulatory requirement reinforces their assumptions of invulnerability. Besides OSHA (1994), various other legislations such as the Electricity Regulations (1994), Employees' Social Security Act (1969) and the latest being CIMAH Regulations (1996) are implemented. Various government agencies are established to enforce these legislations especially after the Bhopal disaster (1984) and Bright Sparklers explosion (1991). For these reasons all Malaysian manufacturing organizations with at least 40 employees are subjected to some of these regulations. Needless to say, the hazardous manufacturing organizations are subjected to more stringent regulations.

Despite many highly publicized disasters in Malaysia and worldwide, it does not seem to influence the mindset of Malaysian manufacturing organizations pertaining to their perception of risk. Their low perception of vulnerability to risk and crises may lead us to believe that Malaysian manufacturing organizations may not do more than what is required by the law. If Malaysian manufacturing organizations do not perceive vulnerability to crisis, than naturally they may not allocate resources to prepare for crisis potentials. Malaysian manufacturing organizations must seek to strike a balance between making profit and investment in managing the adverse effect of manufacturing activities.

Though, ideally, greater crisis preparedness should be a natural outcome of organizational beliefs and awareness of their vulnerabilities to risk and crisis, this result provides evidence that is contrary to what is hypothesized; perception of risk has no direct positive influence on organizational concern for crisis and adoption of crisis management preparedness. Even though the hypothesis is not supported, there is reason to belief that this result may be peculiar to Malaysian manufacturing organizations.

Conclusion

Crises and disasters are chaotic situations. As the magnitude and impact of organizational crises continue to expand, many organizations need to step back, to reassess the match between their greatest threats and their crisis management abilities. In fact, this study allows managers and executives to use the evidence from this empirical research to assess their vulnerabilities to crises. Whilst no one can

prevent all crises; let alone predict how, when, and where it will occur, organizations can adopt a systematic and comprehensive perspective for managing them more effectively. But perhaps the fundamental issue underlying crisis preparedness is attitude and humility, rather than conformity and arrogance.

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