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Effect Of Supply Chain Risks On Performance Of Large Scale Manufacturing Firms In Kenya

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ABSTRACT :*Supply chain risks is a growing global threat to manybusinesses.A survey done by Business Continuity Institute established that 85% of firms experienced at least three supply chain disruptions annually resulting in less revenues, declining customers and damaged reputations. The manufacturing industryemploys13% of the country's labour force and is regarded as the country's economy driver to global competitiveness by 2030. It has howeverbeen distressed with supply chain disruptionsleading to downsizing and closure of some firms,subsequently resulting toloss of jobs. Empirical studies reviewedonly focused on the dimension of supply demand risksignoringdemand variability risk. Consequently,information on the application of the two variables together islacking.Thestudy soughtto establish the relationship between supply chain risks and performance of large scale manufacturing firms in Kenyaguided by Resource Based View framework and acorrelationalsurvey design.The study targeted473 Officers of the manufacturingfirms in Nairobiout of which a sample of 403 was obtained after engaging 70 officers randomly selected in a pilot study.Pilot results revealed 34 item instrument reliability of 0.8999.Experts review, Barlett'sSphericity test of $\alpha = 0.000<0.05$and factor scores correlation matrix of 0.586(SC Risk) and 0.191(Performance)<0.7 ascertained validity.The study establisheda significant effect of SC Risks on performance ($F=2.596$, $\alpha=0.051$, $p<0.005$).The findings abetthe theoretical position that firms should avert all SC Risks as they can potential jeopardize their operations. The study recommends that all SC Risks be avertedand in particular product quality failure, physical products flow disruption and profit margin erosion. These findings will act as a preamble for further research in Supply Chain.*

KEY WORDS*: Supply Chain Risks, Performance,Large Scale Manufacturing Firms*

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I. INTRODUCTION

The objective of every supply chain is to maximize the overall value generated Chopra et al., 2013). To realize this the supply chain managers, have to create an integrated approach to a company's end-to-end supply chain, from the furthest upstream suppliers to its end customers, with participants working in concert toward common goals. Practices such as lean manufacturing, outsourcing, and supplier consolidation, companies have made it possible (Deloitte Consulting LLP, 2013) and as a result these efforts have led to lower costs, higher quality, shorter time to market, and increased business agility. As such most supply chains have become interconnected and globally and this has resulted to them becoming more vulnerable, with more potential points of failure and less margin of error for absorbing delays and disruptions.With this increase in operations and venture in to the global market supply chain risksexposure has become inevitable and has imminently increased. A 2011 survey by the Business Continuity Institute found that 85 percent of companies with global supply chains had experienced at least five supply chain disruption in the previous 12 months (Bhamra, Dani & Burnard, 2011). The costs of such disruptions can be high, leading to fewer revenues, increased downtime, delays in delivery, lost customers, and even damaged reputations. One study found that companies have experienced 30% lower shareholder returns compared to their peers in the wake of a publicly announced disruption (Hendrick & Singhal, 2005).

These disruptions are numerous and are associated with the upstream side of their supply chains supply demand risks (SDR and Downstream side of the supply chain (DVR). SDRreside in purchasing, suppliers, supplier relationships, and supply networks and include supplier business risks,production capacity constraints on the supply market, quality problems, and changes in technology and productdesign (Zsidsin, Panelli, & Upton, 2000). DVR include disruptions in the physical distribution of products to the end customer, usually intransportation operations (e.g., a truck driver strike) (McKinnon, 2006) and the distribution network (e.g., a delay ina distribution centre) and originates from the uncertainty caused by customers'unforeseeable demands (Nagurney, Cruz, Dong & Zhang, 2005). Trkman and McCormack (2009) in agreement asserts that risks from

continuous changes due to turbulent environments, such as changes in customer demands or supplier priorities, have been relatively ignored. Thus, this study seeks to examine supply chain risks from the dichotomy of SDR and DVR.

Performance not only refers to accomplishment of results within the budget limits (Fapper, Fortan& Stoop, 1996; Mwita, 2000; Scotti, 2004) rather it could refer to how well things are done i.e. how efficient, effective and productive the outcome is. Ordinarily and according to Gunasekaran, Patel &McGaughey (2004) SC performance (outcomes) on its own is an outcome, while the firm performance is the impact. Performance evaluation should therefore utilize both financial and non-financial measures and for this reason this study does not consider only supply chain measures adequate for measuring performance of the manufacturing firms but rather a combination of both financial and operational measures.

The manufacturing sector are considered to be the major drivers of the Kenyan economy to global competitiveness by 2030 (GoK, 2007). According to the KIPPRA report (2013), manufacturing sector is a major contributor to the Kenyan economy as it currently employs 277,900 people, which represents 13% of the labour force in the formal sector with an additional 1.6 million people employed in the informal side of the industry. Nearly 50% of manufacturing firms in Kenya employ 50 or more workers. The sector comprises of about 3,700 manufacturing units and is divided into several broad sub-sectors. KAM has classified manufacturing sector into categories identified as: Building, Construction & Mining, Chemical & Allied, Electrical & Electronics, Food Beverages & Tobacco, Leather & Footwear, Metal & Allied, Motor Vehicle &Accessories, Paper & Board, Pharmaceutical & Medical Equipment, Plastics & Rubber, Textiles &Apparels, Timber, Wood Products & Furniture, Consultancy & Industrial Services and SME Focal Point and service sector (KAM, 2015).The top three manufacturing subsectors account for 50% of the sector GDP, 50% of exports, and 60% of formal employment. Overall, manufacturing contributes 10% to GDP. The bulk of Kenya's manufactured goods (95%) are basic products such as food, beverages, building materials and basic chemicals. Only 5% of manufactured items, such as pharmaceuticals, are in skill-intensive activities (KIPPRA, 2015). According to PwC(2010) Kenya's manufacturing subsector has a challenging history in terms of performance attributed to unstructured supply chain strategy and supply chain risks.This has caused many manufacturing subsector companies in Kenya particularly the private and multinational manufacturing firms to collapse, relocate to other countries, shut down, downsize operations and even retrench staff due to stiff competition from imports.Theseproblems facing the manufacturing sector hurts the entire economy and despite this no study has been found practicable enough to help solve the problem.

II. LITERATURE REVIEW

Supply Chain Risk Concept

Risks in the supply chain context has received a growing attention in SCM research e.g. (Zsidsin, 2003; Peck, 2005; Ellis et al., 2010; Tummala& Schoenherr, 2011).Sitkin and Pablo (1992), defined supply chain risks as the extent to which there is hesitation whether potentially desired or insignificant /unwanted outcomes of decision will be realised. In 2002, Sitkin and Pablo further described supply chain risks as uncertainty about potential outcome, whether it is momentous and/or insignificant in the decision that occurred. On the other hand, Faisal, Banwet and Shankar (2006) defined supply chain risks as consumer's perceptions of the insecurity and undesirable consequences for buying products or services. In a related development Mitchell (1999) described supply chain risks as the likelihood of loss and the implication of that loss for the individual or organisation. He formulated a principle of risks to assess the probability of loss (P) and the significance (l) of that loss as; Risks = P (loss) X l (loss).There are however no consistently accepted dimensions of SCRs and several different classifications are reported in the literature. For example, Tang (2006) classified SCRs into two dimensions: disruption risks and operational risks. Other SCRs include supply risks, process risks, demand risks, and technology risks e.g. (Bogataj&Bogataj, 2007; Tang & Tomlin, 2008).

Firms are exposed to numerous risks associated with the upstream side of their supply chains supply demand risks (SDR and Downstream side of the supply chain (DVR). SDRreside in purchasing, suppliers, supplier relationships, and supply networks and include supplier business risks,production capacity constraints on the supply market, quality problems, and changes in technology and productdesign (Zsidsin, Panelli, & Upton, 2000). DVR include disruptions in the physical distribution of products to the end customer, usually intransportation operations (e.g., a truck driver strike) (McKinnon, 2006) and the distribution network (e.g., a delay ina distribution centre) and originates from the uncertainty caused by customers'unforeseeable demands (Nagurney, Cruz, Dong & Zhang, 2005). Trkman and McCormack (2009) in agreement asserts that risks from continuous changes due to turbulent environments, such as changes in customer demands or supplier priorities, have been relatively ignored. Thus, this study seeks to examine supply chain risks from the dichotomy of SDR and DVR.

Performance Concept

Performance not only refer to accomplishment of results within the budget limits (Fapper, Fortan& Stoop, 1996; Mwita, 2000; Scotti, 2004) rather it could refer to how well things are done i.e. how efficient, effective and productive the outcome is. Ordinarily and according to Gunasekaran, Patel &McGaughey (2004) SC performance (outcomes) on its own is an outcome, while the firm performance is the impact. Performance evaluation should therefore utilize both financial and non-financial measures and for this reason this study does not consider supply chain measures adequate for measuring performance of the manufacturing firms. Most organizations have not made us of the balanced framework for financial and non-financial indicators as the challenge exist on how to balance the financial measures which are generally well developed and only examined by external stakeholders against the operational measures which are ad hoc and lack formal structure. During performance evaluation and measurement, considerations should be made to avoid disparate and incompatible measures. This measurement system was proposed to evaluate corporate performance evaluation from four different perspectives: the financial, the internal business process, the customer, and the learning and growth by (Kaplan & Norton, 1992). According to Kleijnen and Smits (2003) the main intent of BSC is to keep score of a set of items that maintain a balance between short term and long-term objectives, between financial and nonfinancial measures, between lagging and leading indicators, and between internal and external performance perspectives. In addition, Kleijnen and Smits, 2003; Bhagwat and Sharma, 2007) states that it can also be used to align businesses to new strategies and reduce cost. In the BSC, the customer metric is crucial since in a SC, one company's customer may be another company's supplier.

However, Neely, Adams &Kennerley (2003) argue the framework contains a serious failure in theirconstruction. It focuses management strictly on a set of pre-defined indicators and measuresmaking them not able to respond to simple and fundamental questions, such as "what ourcompetitors are doing?" The BSC does not monitor competition or technological developments.This implies that it does not consider the uncertainty inherent risks involved in theevents that can threaten this strategy. The effect of this control model can lead to seriousdysfunctional behaviour and loss of control over the implementation of the strategy (Norreklit,2003). Due to problems in the implementation of the strategy it is difficult to achieve a balance between financial and non-financial measures as suggested in the framework (Anand et al., 2005). Richardson (2004) also notes that organizations over concentrate in the task ofgenerating indicators and give less time to the definition of strategy resulting into indicators thatare not aligned with the strategic objectives.

To solve the BSC problem of not considering the uncertainty inherent risks involved in theevents that can threaten strategy implementation and the inadequate supply chain measures, the current study will combine the measures of both supply chain outcome and firm's performance. No study previously has considered employing an integration of comprehensive supply chain performance measures adopted from the works of (Gunasekaran et al., 2001; Cumbo, Kline & Bumgardner, 2006); Holweg, 2007) and BSC measures developed by (Kaplan & Norton, 1992) that measure firm's performance in measuring the overall performance of a firm. A determination of performance using this comprehensive set of questions, the study believes will provide performance data that is efficient (provide information on accomplishment of results within the budget limits) effective (provide information on how well things are well done) and Productive (provide information on the results of the efficiency and effectiveness in term of the outcome).

Supply Chain Risk and Performance

There is abundant evidencethat disruptions can have a material and negative impact on company performance (Hendricks& Singhal, 2003, Sheffi, 2005, Hendricks & Singhal, 2005). Wagner and Bode (2008) confirms the potential negative effect of risks on the supply chain by allaying that firms that are exposed to risks in supply chainscan expect lower performances as compared to those who are exposed to lower levels ofrisks. Higher level of risks according to them means more disruptions and negative consequences such asquality problems, customers' complaints, delays and mismatch of supply and demand. Consequently, Lonsdale and Cox (1998); Knight (1921); Wagner and Bode (2008) all concur on the negative effect supply chain risks has on performance.

Past studies have attempted to establish the effect of supply chain risks on firm's performance. For instance, Avelar-Sosa, García-Alcaraz &Castrellón-Torres (2013) assessing the effects of some risks factors in the supply chain performance by employing demand risks measure and supply chain performance measures rated on a scale focused only on demand variability risk. Okonjo (2014) seeking to establish the relationship between procurement risks management practices and supply chain performance of mobile phone serviceproviders in Kenya using a descriptive study design focused on supply demand risk. Ritchie & Brindley (2007) focusing on supply demand risks examined the effect of supply chain risks management on performancethrough the development of a framework by matching the constructs of performance and risks. Venter and Nagy (2010) aiming to construct and test a model summarizing that besides the tools adapted to manage information flow, materials flow and costs and performance in supply chains to achieve high overall performance, managing risks is also inevitable focused on supply demand risks.

Zhao, Hao, Sun and Zhao (2012) coming close to this study also empirically explored the relationships among supply chain risks (SCRs), supply chain integration (SCI), and company performance, however they focused on supply demand risks. Most previous studies reviewed only focused on the dimension of supply chain demand risks and did not consider demand variability risks relatively ignoring demand side risks as confirmed by Trkman and McCormack (2009). Only one study examined demand variability risks and it too ignored the supply aspect of supply chain risks. The measures employed by the previous researchers were therefore limited and could not therefore produce valid measures of supply chain risks. Consequently, Previous researchers in an attempt to measure performance to determine the effect of supply chain risks on it employed uncomprehensive measures of supply chain performance focusing only on the impact of supply chain functions to the customer and not on the overall firm's performance which is the core reason for the organization existence. In an attempt to solve this most studies have considered using the BSC, however the BSC is criticized by Neely, Adams &Kennerley (2003) who argue the framework contains a serious failure in its construction as it focuses management strictly on a set of pre-defined indicators and measures making them not able to respond to inevitable and unforeseen factors such as supply chain risks. However, despite the numerous attempts to carry out studies to establish the effect of supply chain risks on performance, information if adequate measures of supply chain risks and robust measures of performance are used to establish the effect of supply chain risks on performance is still lacking. It is in this regard that the study sought to determine the relationship between Supply Chain Risk and Performance and to achieve this it tested the following hypothesis

$H0_1$: Supply chain risks have no significant effect on performance of large scale manufacturing firms in Kenya.

III. METHODOLOGY

This studyadopted a correlational surveyresearch design.Survey design assist in securing information andevidence on existing circumstances and to identify ways to compare present conditions so asto plan how to take the next step (Kelley, Clark, Brown, &Sitzia, 2003). Correlation research design on the other hand assist in establishing the associationbetween variables. The target population for the study were all the 473 large-scalemanufacturing firms in Nairobi out of which a seventy (70) large scale manufacturing firms were randomly selectedto participate in apilot study and the remaining four hundred and three (403)all drawn using census survey sampling technique to participate in the actual study.

Instrument Reliability Test

The reliability of Linkert scale was assessed by subjecting the scalesmeasuring the 8 SC Risks items, and 10 Performance items to a Cronbach Alpha reliability test. The result of the test from the pilot study indicated a computed Cronbach alpha value of $\alpha = 0.8999$which is above the threshold of $\alpha > 0.7$ suggested by (Hair, Anderson, Tatham, & Black, 1998;Zikmund et al., 2010and 0.6 suggested by George & Mallery,2009.Each subscale is equally reliable at $\alpha > 0.7$; SC Risk $\alpha = 0.8498$, and Performance $\alpha = 0.9110$.

Instrument Validity Test

A preliminary test done to ascertain singularityand multicollinearity of the SC Risk and Performance subscales established the correlational matrix valuesfor the twosubscales (SC Risk and Performance)were all less than 0.9 and significant at 95% confidence level.Thetolerance test for each subscale was also establishedat 0.042 correlational matrix determinant for SC Risks subscale which is greater than the cut of point of 0.00001(Hair, Anderson, Tatham, & Black, 2013). The less than 0.9 correlational matrix values for all the subscales and the correlational matrix determinants which exceeded the set threshold of 0.00001 indicated singularity and multicollinearity were not going to be a problem for these data sets. To put it simple, the interpretation of the variate was not going to be complicated as it was going to be easy to ascertain the effect of every single variable as the correlation between the variables were below 0.9. which is below the cut-off point of 0.9 (Hair et al., 2013). Bartlett's test of Sphericity was established at $\alpha = 0.000$ implying that each scale is unidimensional (instrument can be used to describe only one construct) (Field, 2005). This indicating convergent validity of the subscales.The sub scales'factor scorescorrelation matrix0.586 which is less than the factor score correlation matrix of 0.7(Vagias, 2006).

Data Analysis

Regression analysis and specifically a multivariate analytical approach with a backward elimination was used to establish the effect of SC Risks on performance and present only those effect that were significant.

IV. DISCUSSION

Effect of SC Risks on Performance

The study purposed to establish the effect of SCRisks on performance of large scale manufacturing firms in Kenya.SC Riskswas categorized into supply demand risk and demand variability risk. Supply demand risk being the risks residing in purchasing, suppliers, supplier relationships, supply networks consisting of (inaccurate demand forecasting,fluctuating occupancy of processing and distribution capacity, fluctuating financial ratios and capital requirements and low service levels)and demand variability risksbeing risk resulting from disruptions emerging from downstream supply chain operationsconsisting of (profit margin erosion, sudden demand change, physical products flowdisruptionproduct quality failure.

Performance was arrived at by finding a composite of the various performance indicators (customer satisfaction, cost efficiency, capacity utilization, research & development, sales volume, reduction in inventory cost, reduction, reduction in unit cost, range of products, inventory turnover rate, total average inventory) to come up with overall performance.

Multiple regression analysis with backward elimination starting with all SC Risk measures and reducing them one by one (from the ones with the highest p-values) until the model remained with only SC Risk indicators that had a significant p-value at 95% Confidence level was done(See Appendix II). The final model had three SC Risks items which had a significant negative effect on Performance namely (profit margin erosion, physical products flow disruption and product failure). All the other indicators of SC Risk namely (inaccurate demand forecasting, fluctuating occupancy of processing and distribution capacity, fluctuating financial ratios and capital requirements and low service levels sudden demand change) had insignificant negative effect on performance and were therefore eliminated and not presented in the final regression coefficients Table1

Theoretical reasoning, the empirical and theoretical literature review led to the belief that there exists a negative effect of SC Risk on performance and for this the study postulated that SC risk wouldhave anegativeeffect on the performance of large scale manufacturing firms in Kenya. Hence, the following null hypothesis wasformulated and tested:

$H0_1$:SC Risks have no significant effect on performance of large scale manufacturing firms in Kenya.

To test this null hypothesis, a full regression model was fitted as presented in Table 1

Table1: Model Summary of the Effect of SC Risk on Performance

	R Square	Adjusted R Squared	RMSE	F	Sig
Model No. i	0.680	0.680	0.445	42.471	0.000

Source: (Survey Data, 2018)

The adjusted R^2 of 0.680 in Table1 indicatesthat 0.684 (68%) of the variance in Performance is explained by SC Risks.This implies that 68% of the variation in Performance is explained by SC Risks and the remaining 32% is explained by the other variables not included in the study.The F-statistics (42.471)which is greater than 2 and a p value of $\alpha = 0.000<0.05$ implies that SC Risks have a significant effect on performance at a confidence level of 95%.

Table1:Effect of SC Risks on Performance

SC RISKS	B	Std. Error	T	Sig.
(Constant)	3.443	0.989	34.82	0.000
Profit margin erosion	-0.074	0.026	-2.83	0.005
Physical products flow disruption	-0.078	0.022	-3.53	0.000
Product quality failure	-0.113	0.022	-5.08	0.000

Source: (Survey data, 2018)

The equation for the regression model is expressed as:

Performance (P)= $3.443 - 0.0.074\ SCR_1 - 0.078SCR_2-0.113SCR_3+ \varepsilon_i$……... (1)

The equation (1) regression model indicates that performance would be at (β=3.443, p = 0.000) holding the SC Risks (profit margin erosion, product flow disruption and product quality failure constant.

Profit Margin erosion was established to be having a significant effect on performance (β = -0.074, α = 0.005 < 0.05).This statistically indicates that a change of one standard deviation in profit margin erosion results in a (-0.074) standard deviations decrease in performance of large scale manufacturing firms at 95% confidence level.Ideally if large scale manufacturing firms were to experience profit margin erosionthere would be to a significant dip in their performance.

Moreover, physical product flow disruption was establishedto be having a significant effect on performance (β-0.078, α = 0.000 < 0.05). This statistically indicates that a change of one standard deviation in physical products flow disruption results in a (-0.078) standard deviations decrease in performance of large scale manufacturing firms at 95% confidence level. Ideally if large-scale manufacturing firms were to experience physical product flow disruption this would translate to a significant decrease in the performance.

Furthermore, product quality failure was established to be having a significant effect on performance (β = -0.098, α = 0.000<0.05). This statistically indicates that a change of one standard deviation in product quality failure results in a (-0.098) standard deviations decrease in performance of large scale manufacturing firms at 95% confidence level. Ideally if large-scale manufacturing firms were to experience product quality failurethis would translate to a significant decrease in their performance.

Thus, among the retained indicators of SC Risks,product quality failure has the highest negative significant effect (β= -0.113) followed by Physical product flow disruption (β= -0.078) and lastly Profit Margin erosion (β = -0.074). Product quality failure is thus a more hazardousSC Risks for a firm's performance as followed by physical product flow disruption and then profit margin erosion.

The (F=42.471 which is greater than 2 and α=0.000<0.05is a suffice evidence to conclude that SC Risks have a significant effect on performance and therefore the null hypothesis that SC Risk have no significant effect on performance of large scale manufacturing firms was rejected.

These finding corroborates the theoretical assertions of RBV (Prahald& Hamel, 1990) that threats (SC Risks) from the firm's environment hamper the firm's ability to exploit opportunities that would enhance its performance.The establishment of a negative effect on performance by supply chain risk confirms the assertion by Wagner and Bode (2008 who by alluded that firms exposed to risks in supply chainscan expect lower performances as compared to those who are exposed to lower levels ofrisks according to them higher level of risks means more disruptions and negative consequences such asquality problems, customers' complaints, delays and mismatch of supply and demand. In the same vein Lonsdale and Cox (1998); Knight (1921); Wagner and Bode (2008) all concur on that supply chain risk has negative effects on organizations performance

The study findings are in support of Chopra and Sodhi (2004) findings that there is a wider consequence of a failure to manage risks effectively which include not only financiallosses but also a reduction in product quality, damage to property and equipment, loss ofreputation in the eyes of customers, suppliers and the wider public, and delivery delays.

The establishment of a clear significant relationship between SC Risks and performance presented by an adjusted $R^2$of 0.68corresponds to Okonjo (2014) who using a descriptive study design conducted a study seeking to establish the relationship between procurement risks management practices and supply chain performance of mobile phone serviceproviders in Kenya. The study established that there was a clear significant relationship between procurement risks management practices and supply chain performance represented by adjusted R2 value of 0.646 which translated to 64.6% variance explained by the ten independent practices of Procurement Risks Management that she studied.

In the same vein as the study findings in a study of more than 800 manufacturing companies that announced a supply chain disruption between year 1989 and 2000 globally, Singhal & Hendricks (2005) found that during a three-year span, regardless of industry, disruption cause or time period, affected companies experienced poor performance of 33-40% lower stock of returns related to their industry peers.

These findings follow the establishment by Zhao, Hao, Sun and Zhao (2012) who empirically exploring the relationships among supply chain risks (SCRs), supply chain integration (SCI), and company performance in a global context established that SCRs, especially supply delivery risks (SDR), are negatively related to SCI which has a contingent relationship with performance.

V. CONCLUSSIONS

Based on the summary of the findings on the studyobjective and in support of theory, past literature and practice the study concludes that SC Riskshave a significant effect on performance of the large-scale manufacturing firms in Kenya. Even though all the SC Risks items had a negative effect on performance not all the SC Risks had a significant effect on performance, as only three of the SC Risks items (Profit margin erosion, physical products flow disruption and product failure) had a significant effect on performance with the other five having an insignificant effect on performance. The three SC Risks items also had varied effect on performance with product quality failure having the highest negative effect followed by Physical product flow disruption and lastly Profit Margin erosion. This implies that product quality failure is a more dangerous SC Risks for a firm's performance as compared to low physical product flow disruption, profit margin erosion and the other SC Risks.

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Model Summary for the Effect of SC Risk on Performance

[1]. (Source: Survey Data, 2018)

Model 1				
SC RISKS	**B**	**Std. Error**	**T**	**Sig.**
(Constant)	3.583	0.17	21.04	0.000
Inaccurate demand forecasting	0.035	0.045	0.78	0.434
Fluctuating occupancy of processing and distribution capacity	0.004	0.055	0.07	0.947
Fluctuating financial ratios and capital requirements	-0.032	0.035	-0.92	0.358
Low service levels	-0.046	0.039	-1.17	0.241
Profit margin erosion	-0.064	0.028	-2.29	0.022
Sudden demand change	-0.038	0.022	-1.68	0.094
Physical products flow disruption	-0.065	0.023	-2.82	0.005
Product quality failure	-0.098	0.025	-3.9	0.000
Model 2				
SC RISKS	**B**	**Std. Error**	**T**	**Sig.**
(Constant)	3.586	0.164	21.83	0.000
Inaccurate demand forecasting	0.036	0.039	0.93	0.354
Fluctuating financial ratios and capital requirements	-0.032	0.034	-0.93	0.353
Low service levels	-0.046	0.039	-1.17	0.241
Profit margin erosion	-0.064	0.028	-2.3	0.022
Sudden demand change	-0.038	0.022	-1.68	0.093
Physical products flow disruption	-0.065	0.023	-2.84	0.005
Product quality failure	-0.098	0.025	-3.93	0.000
Model 3				
SC RISKS	**B**	**Std. Error**	**T**	**Sig.**
(Constant)	3.532	0.118	29.84	0.000
Low service levels	-0.04	0.038	-1.05	0.296
Profit margin erosion	-0.06	0.027	-2.21	0.028
Sudden demand change	-0.034	0.021	-1.57	0.117
Physical products flow disruption	-0.068	0.023	-3.01	0.003
Product quality failure	-0.097	0.024	-4.1	0.000
Model 4				
SC RISKS	**B**	**Std. Error**	**T**	**Sig.**
(Constant)	3.443	0.099	34.82	0.000
Profit margin erosion	-0.074	0.026	-2.83	0.005
Physical products flow disruption	-0.078	0.022	-3.53	0.000
Product quality failure	-0.113	0.022	-5.08	0.000

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