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EXAMINING PREVAILING INTERNAL VALUE CHAIN RISKS IN HORTICULTURE VALUES CHAINS AND ITS MANAGEMENT IN ETHIOPIA: THE CASE OF EAST SHOWA TOMATO PRODUCERS

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Abstract

Many studies found that value chain risk management plays great role to get competitive advantage in the chain. However, despite its role, managing prevailing risks in the chain was not studied in comprehensive way by including both internal factors. The sample size of the study was a total of 275 farmers, input dealers and market traders found in East Shawa zone. The source of the data of the paper was both secondary and primary data in which the primary data was collected through questionnaires and interviews which was developed in English language and translated in local language. To achieve this objective, this study was divided in two stages: an exploratory and casual relationship testing. The findings of the study show that there is no efficient risk management program, there is no cooperation and coordination among value chain actors. In addition there is no design strategy to mitigate value chain risks and internal factor risks elements have medium importance in business activities to manage value chain risks. The multiple regression result show internal factors were significantly and positively influence effective risk management.

Keywords: *Risk, value chain risk management, internal factors*

1. Background of the Study and Aspects of Problem

Now days, new model of organization is popular in business organizations particularly in agribusiness sector that seeks to merge social mission and objectives with core business operating principles, known as agri-business value chains. According to Dunn (2014) an agriculture value chain is a vertical linking or a network between various independent business organizations and can involve processing, packaging, storage, transport and distribution. These business arrangements are distinguished by their commitment to transparency, collaborative business planning and exchange of market intelligence and business knowhow among chain partners and their interest in developing business strategies and solutions that yield tangible benefits to each participant in the system. Thus efficiency gains resulting from close coordination among supply chain partners, higher prices earned through marketing differentiated products, and shared values articulated by chain participants helps markets to responds to consumer demands and interests (Diamond eta'l 2014), but to get these benefits from agri-businesses, identifying prevailing risks and finding the way to cope up risks is very important. Currently due to the influence of growing incomes, urbanization and globalization of trade, agriculture in developing countries is shifting increasingly towards agri-business which focuses on value addition to agricultural outputs before delivering to the market. These bring opportunities and threat to actors in the sector. Opportunities arise from greater demand for agriculture products resulting from growing populations requiring greater diversity in consumption.

Indeed, with changing consumer preferences in both domestic and export markets, new opportunities have emerged for producers, particularly in the development of niche markets and differentiated products with potentially higher price premiums than standard commodities. On the other side producer access to these new opportunities remains limited by numerous deficiencies throughout the value chain that increases risks faced by producers. This magnified the growing need to coordinate all stages of production, marketing, logistics, and sales in a way that satisfies consumer demands for quality, traceability, and food safety. The coordination requires developing viable and sustainable value chains to manage the flow of products between intermediaries and ensure that quality specifications

are met. In addition synergizing the relationships between the public and private sectors, creating dynamic and sustainable partnerships to ensure inputs are available and used appropriately helps relatively to lower participants' risks in value chains. Therefore public-private partnerships are an integral part of agricultural value chains particularly for horticulture producers and they should work together in functional partnership manner to minimize risks in the sector and to ensure benefits of all stakeholders. This can help agri-business forms to get competitive advantage in the market.

However managing prevailing risks in the sector to develop closely-aligned value chain to achieve sustainable competitive advantage is still in its infant stage. There are commonly cited reasons for the slow development of risk management in agri-business value chains. First, participants operate in an environment where policies and structures result in a continuation of the adversarial relationships and attitudes that have historically characterized the industry. Second, there is a lack of understanding regarding how to successfully manage risks associated with forming and managing value chains. Third, by its nature agriculture and food systems are at the highest risk from so called "sustainability mega forces" such as poverty, hunger, population growth, climate change, competition for scarce natural resources, and environmental degradation. Yet, many corporate private investors involved in agribusiness are currently ill-equipped to respond to these challenges and are making little progress in reducing their ecological footprint and exposure to environmental cost (Eco Agriculture Partners, 2013). Fourth, specifically in Ethiopia, agricultural sector particularly horticulture production bottlenecks are many which includes land related problems, Lack of access to capital/long-term loan and weak support in business skill, marketing and post production (Samuel Gebreselassie 2012). Regarding to land related problems, even though over recent years tenure security has improved by government, land rental markets operate under different restrictions. Beyond their use right, farmers cannot use their land as collateral and they have difficulty to access long-term loan, because in Ethiopia the Banks and other financial Institutions to provide loans they need collateral and most of the time provide loan for large-scale producers with collateral. These can have impact on small farmer productivity and production. On the other hand, lack of organized market system and broader agricultural policy of the country that overlooked emerging group of small-investor farmers reduce production and productivity of horticulture sector. These cause for low contributions of the sector to country's economy and even less than 10% potential have been used.

The above mentioned problems caused agriculture industry to have little connectivity with the end market and most of agri- business firms didn't take any initiatives to manage risks associated agri-business (Ulrich Hess eta'2015). These risks are related to internal and external agri-business value chain. Risks of Internal factors that affect horticulture business value chain include cultural related factors, strategic factors, chain structure, performance measure and feedback and technology related factors. Hence this study conceptualized prevailing risk in Tomato value chain and examined the impact of internal factors. Therefore this, study findings will significantly contribute to knowledge gaps related to information sharing amongst actors in the value chains to minimize risks. In addition, the research findings will contribute to the national strategy for growth and poverty reduction by facilitating ways to add value to agricultural outputs.

The 2008 World Development Report outlined that investments in agribusiness will produce significant multiplier effects through their forward and backward linkages, generating demand for agricultural products and associated inputs and services and creating on and off-farm employment. In Ethiopia, this has been put into practice by the federal Government through the Agricultural Development Led Industrialization (ADLI) followed by the Growth and Transformation Programme that currently enters its second phase. While the first phase still focused on increasing production, the second phase focuses on agro-processing and industrialization. However, agribusiness entrepreneurs interviewed by Agribusiness Innovation Initiation (AII) expressed their needs for professional education aimed at increasing marketing knowledge, value and supply chain analysis, and networking. Most importantly, the needs assessment conducted by Embassy of Kingdom of the Netherlands in Ethiopia (EKN,2014) indicates that customs related issues and work ethics in national labour force, Leadership skills, Entrepreneurship, knowledge of Risk Management were ranked by agribusiness companies to be among the top five biggest problems in doing business in Ethiopia. Also, agribusiness entrepreneurs demands tertiary level studies should exert their efforts in imparting knowledge in disciplines such as: Financial management, Marketing, Human behavior, Operational management, and Agribusiness project analysis as part of the common body of business knowledge and Policies and regulations affecting agriculture, Value chain management, International businesses, Risk management,

Strategic management, and Applications of concepts and techniques of agribusiness-firm management (i.e., managerial or production economics) as part of agribusiness management. Hence it is possible to deduce that, agribusiness entrepreneurs especially those who invested in horticulture are highly sensitive for risk causing factors compared to other investors. Therefore, this study is going to analyze prevailing internal risks in horticulture Values Chains and its risk Management. In order to fulfill these objectives the following research questions will be used.

1. What are internal risks faced by Tomato value chain actors and how do these risks impact on their performance?
2. Which factor is the most significant in Enterprise Risk Management activities?
3. What are the adaptation strategies of Tomato value chain actors to mitigate risks?

1.1 Hypotheses

Based on extensive literature made for this study the following hypotheses were developed to examine the relationship between independent variables (internal factors) and dependent variables effective value chain).
H1: Favorable internal factors increase effectiveness of value chain actors.

1.2 General Objectives

The general objective of this study was to assess prevailing internal risks in horticulture value chains specifically in Tomato production value chain and risks its management.

1.2.1 Specific Objectives

To achieve the general objectives, the following specific objectives are set

1. Examine internal risks that affect performance of Tomato value chain actors in East showa zone.
2. To identify the most significant internal factor in Tomato value chain risk management East shawa zone.
3. To analyze value chain actors' adaptive strategies in response to risks and determine the policy implications of the research findings.

2. Theoretical Review

2.1 Introduction

Agriculture is often characterized by high variability of production outcomes. Unlike most other producers, agricultural producers are not able to predict with certainty the amount of output that the production process will yield due to internal and external factors s World Bank, 2005). Risk and shocks in agriculture, also resulted in uncertainty in output prices. This can result in severe income losses and fluctuations in consumption (Haile, 2007). Low and middle-income countries rural households are highly vulnerable to agricultural risks and suffer the most, because they have limited ability to offset risks and shocks (Linnerooth-Bayer and Mechler, 2009).This leads to extreme farm income fluctuations even though farmers have developed ways of reduce and cope with risk (e.g. crop diversification, selling livestock, storage, borrowing and safety net) (Haile, 2007).

2.2 Internal Risks in Horticulture Value Chain

The risks faced by agriculture have often been classified internal risks and external risks. Internal risks include cultural, strategy and chain structure.

2.2.1 Share Organizational Culture and Value Chain Actors' Performance

Shared organizational culture includes involves creating proactive inclusive management style, developing an environment which increase customers and consumers loyalty and foster a learning environment within and between partner organizations. Of all the critical success factors, organizational culture is arguably the most important in determining companies' suitability to partner. Since the 1970s, recognition of the impact that organizational culture

has upon the operations that occur within a company, and between itself and its business partners, has grown markedly (Ivancevich, Olekalns& Matteson, 1997). Culture affects how a business and its employees view the world around them (Dunne, 2004). It influences attitudes towards collaborating as a cohesive unit, the desire to learn from new experiences, the ability to adapt to new situations, the length of time horizons, autonomy vs.autocracy, empowerment vs. disempowerment, and attitudes towards risk; just to name a few.

Unless the company's culture is suited to working within an alliance and looks to proactively take advantage of opportunities from within, rather than continually reacting to external threats in a defensive manner, it is highly unlikely that a business will make a suitable partner withwhich to form an alliance. Study conducted by Teeratansirikool, Siengthai, Badir, &Charoenngam (2013) shows that sharedorganizational culture among value chain actors' influence competitive strategies positively and significantly enhance firm performance. Khan &Pillania (2008), argued that supplier evaluation, strategic supplier partnership, sourcing flexibility and trust in value chain members have asignificant effect on supply agility and firm's performance.

Qrunfleh&Tarafdar (2014) posits that in small firms, efficient value Chain integration plays a more critical function for sustainable performance improvement, while, in large firms, the close interrelationship between the level of VCM practices and competition capability have more significant effect on performance improvement. Li, Ragu-Nathan, Ragu-Nathan, &SubbaRao (2006)in their study they conceptualized on five dimensions of SCM practices (customer relationship, quality of information sharing, strategic supplier partnership, level of information sharing, and postponement) and tested the relationships between competitive advantage, SCM practices, and organizational performance. Their results indicate that higher levels of SCM practices can lead to improved competitive advantage and enhanced firm performance. Therefore it is possible to conclude these SCM practice will improve competitive advantage and enhanced performance of value chain actors. This leads to the hypothesis:

2.2.2 Strategic Factor and Value Chain Actors' Performance

Companies with complementary attitudes, cultures, and leadership styles choose to coordinate their business arrangements over a short to medium timeframe. A more strategically aligned structure than the one exemplified above causes at least part of the chain to think and act from a strategic – and not only operational or tactical – perspective. A strategic perspective arises from operating in an external environment that allows this type of approach to occur. Over time, the participants come to steadily acknowledge the benefits of conducting medium-term business deals with chosen suppliers and buyers, leading to increased levels of commitment and the development of more sophisticated value chain management capabilities. On the other hand companies engage in longer-term strategic arrangements that involve collaboratively sharing resources and/or investing in the capabilities required to achieve mutually beneficial outcomes. Successfully adopting this type of model requires the involved businesses to possess compatible cultures, vision, and leadership, these can improve performance and competitiveness of value chain actors.In addition working collaboratively, members of a closely-aligned value chain can simultaneously minimize their transaction costs, increase their profit margins and maximize the value of the final product (Womack & Jones, 2005). This leads to the hypothesis:

2.2.3 Value Chain Structure and Value Chain Actors' Performance

A value chain map lays out all kinds of activities, transactions, flows (e.g. information), and processes pertinent to a value chain. It is also a useful tool to identify the captured value at each link in the chain, to look at the value chain structure itself and to identify the different actors in value chains. Value chains tend to be long and lack integration, involving a number of intermediaries on the other side short value chain structure especially in Export market may lock-in of farmers within value chains: as producers often are not able to bear high costs of certification, exporters take over this financial burden and hold certification rights. Looking to recover these costs, exporters enroll smallholders in 'contract farming'-like arrangements. Small producers become locked into these value chains. This increases producer dependency from one exporter, but also improves access to information, knowledge, and facility upgrading and quality improvement. But in the case local market the benefits of short value chain structure is greater than its cost because if the middlemen number is reduced the producer sell their product by fair price and final consumers also pay price fair price for products.

The above discussion focused on internal factor elements leads to the hypothesize the following
H1: Favorable internal factors increase effectiveness of value chain management

3. Research Methodology

3.1 Research philosophy

The study adopted positivist philosophy of science, which according to Buttery & Buttery (1991) and Stiles (2003) assumes unity of scientific method, searches for causal relationships, believes in empiricism and views the foundation of science as based on logic. Positivist research is characterized by testing one or more hypotheses. Consequently, problem-solving under the positivist paradigm follows a pattern of formulating hypotheses, in which assumptions of social reality are made, thereafter hypotheses are tested, often using quantitative techniques; this process leads to verification or rejection of the hypotheses. Thus, through the positivistic approach the researcher will able to establish the nature of relationships that underlie them, test the formulated hypotheses and make generalizations from the research findings. This is because the reality surrounding the phenomenon of risk management factors and the performance of Tomato production value chain actors in Ethiopia studied objectively. Given that the first study seeks to identify the relationship between operational factors and value chain actors' performance. The second seeks to examine the relationship between external factors and value chain actors' performance.

3.2 Research Design

For these studies cross-sectional survey design was used. According to Umma (2006), the positivist approach places a high priority on identifying causal linkages between and amongst variables. Given this approach, a cross-sectional survey method used to obtain the empirical data to determine the linkages between variables. Both qualitative and quantitative data was collected by using interview schedules, structured and unstructured questionnaire and focus group discussions.

3.3 Population of the Study and Unit of Analysis

The target population was all actors in Tomato production value chains in East Showa zone. East Showa zone is a potential vegetable producing area for both export and local markets in Ethiopia. The unit of analysis was Tomato production value chain actors which include farmers, input dealers and market traders found in East Showa zone. To conduct this study potential Woredas and Kebeles in the zone were randomly selected. To select respondents'multi-stage stratified sampling technique was used. The base for creating strata was the type of activities involved by value chain actors, such as; farming, agro-processing and marketing and proportional sample was taken from each stratum. To determine sample size the research used population-based survey which determined largely by three factors according to (Kothary, 2004, p. 180).
The estimated percentage prevalence of the population of interest 5%; the desired level of confidence and the acceptable margin of error. For a survey design based on a simple random sample, the sample size required can be calculated according to the following formula.

$$n = \frac{z^2 pq}{E^2} = \frac{(1.96)^2 (.50)(.50)}{(.05)^2} = 385$$

Where:

n = Adequate sample size within a given amount of confidence level
Z= table value of the confidence level from normal distribution
e = tolerable amount of error the researcher accepts
p = the probability of success (proportion of the study unit who may give adequate information)

q = the probability of failure

Since there is no prior figure concerning the proportion of success and failure, it is advisable to take 50-50 approach which is conservative. The researcher intends to pursue for 95% confidence level with 5% level of tolerance. Hence, the computation of sample size was preceded as follows:

n= 384.6 385

385+15= 400

The total sample size of respondents =400

Therefore four hundred Tomato production value chain actors were sampled and contacted. . In this study, Tomato production value chain actors have been stratified into four levels by considering the actors activities. Accordingly sample was taken from farmers, tomato traders large scale producers and agro-processor and the total sample size was proportionally allocated to potential kebele's found in East Showa zone by using the following formula.

Where nh is the sample size for stratum h, Nh is the population size for stratum h, N is total population size, and n is total sample size.

Table 3.2 Sample size for Each Woreda's

zones	Potential woreda's	Total target population	Sample Size
East Showa Zone	Dugda woreda	2303	143
	Bora Woreda	1630	101
	Zuway/Batu	2511	156
	Total		400

3.4 Research Methods and Sources of Data

The study employed multiple data collection tools, including interview schedules, structured and unstructured questionnaire and focus group discussions. To conduct this study both primary and secondary data collected. Primary data was collected from farmers, agro-Processor managers, market traders and government officials found at different level of administration starting from zonal to kebele level. Secondary data was collected from journal, books, articles, government legislation and policies.

3.5 Research Strategy

Data was collected using both survey and case study methods, and presented a combination of interpretive and exploratory research. Survey shall collect data about the prevalence of risks in selected Tomato value chains. While case studies included in-depth studies to identify the most influential elements from both internal and external element.

3.6 Data Analysis

Quantitative data was statistically analyzed using computer software programs, Statistical Package for Social Sciences (SPSS) to yield some statistics for comparison and establishment of nature of relationship between variables. Content analysis was applicable with case studies with quantitative data.

3.7 Validity and Reliability of the Instruments

Credibility of findings depends on the extent to which the analysis corresponds to how the study participants really interpret and construct their realities. Validity in this sense is the extent to which a description is credible (Slevitch, 2011). Therefore to ensure that this study produces credible and transferable results the researchers adopted a within-method triangulation. This triangulation involves the use of multiple data collection techniques such as those that described above as well as adopting a multi-source approach in data collection. The variety of techniques and data sources will make it possible to cross-check information in order to enhance its credibility. Further, in qualitative research, being aware of and accepting one's personal biases is part of validating the research. Researchers may frame

their questions and shape their studies based on their personal experiences and personal bias. As a researcher, we have acknowledged that my biases in framing the topic could relate to my academic background and personal interest. It is also important to note that the results of this study was context specific, meaning they will be much more applicable to the value chains that was studied and cannot therefore be inferred on the entire agriculture output value chain except for Tomato value chain in Ethiopia. However, the findings will still provide an understanding of the dynamics of local agricultural value chains which could be relevant for the sector in Ethiopia and across the region. Reliability refers to the extent to which a study produces consistent findings on repeated trials (Mikkelsen, 2005).To check reliability of instrument Cronbach's alpha value was calculated.

4. Research Limitations

Some of the limitations which researcher aware of but cannot totally eliminate are based on the qualitative approach that was used in this study which requires more time in order to enable one to understand the dynamics of Tomato value chains and their surrounding environment in depth. To counter this threat, the researcher collected as much secondary data as is possible prior to embarking on field work so as to gain a deeper insight of the study sector and the target value chains were information is available. The researchers also familiarized themselves with government documents relating to promotion of the private sector development, agriculture marketing and input support. The use of digital voice recorders (where acceptable) was engaged so as to have maximum utilization of time in the field as this was more efficient and faster compared to jotting down notes.

4.2 Result Analysis and Interpretation

This study was conducted in East Showa zone. The Woredas which were targeted for the study include: Bora Woreda, Dugda Woreda and Batu(Ziway) which are the hub of tomato production. The sample size of the study was a total of 400 farmers, input dealers and market traders found in three selected woredas. .Accordingly 400 questionnaire was distributed to sample respondents' and on average 270 questionnaire were filled properly and used for this study. But in filling questionnaire same of questions were not responded and overlooked by data collector, therefore there is no uniform number of respondents for all question.

Table 4.1 Number of respondents from each Woreda

	Frequency	Percent	Valid Percent	Cumulative Percent
ZIWAY	155	56.8	56.8	56.8
BORA	30	11.0	10.5	67.3
DUGDA	89	32.7	32.7	100.0
Total	274	100.0	100.0	

Source: survey 2018

The above table illustrated the sample respondents in targeted woredas (districts) whereby the research is conducted. Accordingly, 56.8%, 11% and 32.2% are from Ziway, Bora and Dugda woredas respectively. From this it is possible to infer that Ziway (Batu) woreda contributes more sample respondents as more organized tomato producers are engaged there.

Table 4.2 The Existence of Efficient Risk Management Program

	Frequency	Percent	Cumulative Percent
YES	71	25.9	27.4
NO	155	56.6	87.3
NOT SURE	33	12.7	100.0
Total	259	100	

Source: Survey 218

As shown in the above table regarding to the existence of risk management program in selected woredas' 71(25.5%) of the respondents replied that there is risk management program in selected woredas'. While the remaining 155(56.6%) and 33(12.7%) of the respondents replied that there is no risk management program and they are not sure about the existence of risk management programs in selected woreda respectively. Therefore from the above data it is possible to conclude that there is no efficient risk management program in selected woredas'

Table 4.3 The Availability of Risk Assessment Methods

Li the method your organization use for risk assessment?			
	YES	72	26.3
	NO	168	761.3
	NOT SURE	19	7.3
Total		259	100.0

Source: Survey 218

As shown in the above table regarding to the use of risk assessment method in selected woredas' 72(26.3%) of the respondents replied that there is risk assessment methods in selected woredas'. While the remaining 168(61.3%) of the respondents replied that there is no risk assessment methods and 19 (7.3%) respondents replied that they were not sure about the existence of risk assessment methods in selected woredas'. Thus from the above result it is possible to conclude that there is no risk assessment methods used in selected three woredas'

Table 4.4 Availability of framework to identify risks

	Frequency	Percent
YES	67	24.5
NO	173	63.1
NOT SURE	23	8.4
Total	263	100.0

Source: Survey: 2018

The above table shows that 67(24.5%) of the respondents replied that there is framework to identify risks and 173(63.1%) of the respondents replied that there is no framework to identify risks. The remaining 23(8.4%) of the respondents replied that there were not sure about the availability of framework to identify risks. Thus it is possible to conclude that in selected woredas' there was no designed framework to identify risks in Tomato value chain.

Table 4.5 Organizational concern about value chain risks

Is your organization/business unit concerned about value chain risks?	Frequency	Percent
YES	83	30.3
NO	171	62.4
NOT SURE	20	7.3
Total	274	100.0

Source: Survey: 2018

The above table shows that 83(30.3%) of the respondents replied that business unit involved tomato value chain were concerned value chain risks and 171(62.4%) of the respondents replied that business unit involved in tomato value chain were not concerned value chain risks. The remaining 20(7.3%) of the respondents replied that there were not sure whether business unit involved in tomato value chain were concerned about value chain risk or not. Thus it is possible to conclude that in selected woredas' the majority (62.4%) business unit involved in Tomato value chain were not concerned about value chain risks signed framework to identify risks in Tomato value chain.

Table 4.6 Discussion about value chain risk management among value chain actors'

Have you had at least preliminary discussions with value chain actors about value chain risk management	Frequency	Percent	Cumulative Percent
YES	110	40.1	40.9
NO	141	51.5	93.3
NOT SURE	17	6.2	99.6
Total	274	100.0	

Source: Survey: 2018

Regarding to discussion with value chain actors about value chain risks to manage risks 110(40.1%) of the respondents replied that they have made preliminary discussions with value chain actors to minimize risks and 141(51.5%) of the respondents replied that they didn't make any preliminary discussion with value chain actors to minimize risks. while the remaining 22(6.6%) of the respondents' were not sure whether preliminary discussion was made with chain actors or not to minimize value chain risks . From the above results more than half(51.5%) of chain actors were not made preliminary discussion to minimize value chain risks. Therefore it is possible to conclude that in selected woredas' value chain actors were not working together to minimize risks.

Integrated Risk Management at Business Level

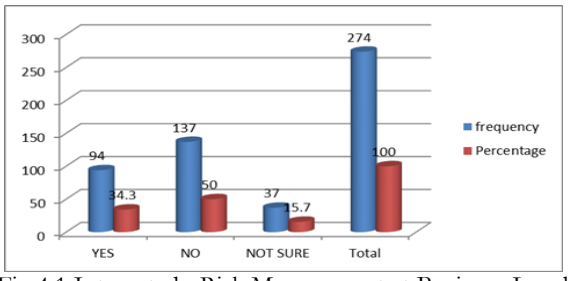

Fig 4.1 Integrated Risk Management at Business Level

The above figure show that whether business organization involved in tomato value chain were integrate risk management activities in their businesses. Accordingly 94(34.3) of the respondents replied that there were integrated risk management activities in their usual business and 137(50%) of the respondents replied that they were not integrated risk management activities at business level. While the remaining 37(15.7%) of the respondents' were not sure whether they integrate risk management activities or not. Therefore from the above discussion it is possible to conclude that almost half (50%) of tomato value actors in selected woredas' were not integrate risk management activities in their usual businesses.

Table 4.7 The existence of strategy to mitigate value chain risks

Have you developed value chain risk mitigation strategy	Frequency	Valid Percent	Cumulative Percent
YES	106	41.4	41.4
NO	109	42.6	84.0
NOT SURE	41	16.0	100.0
Total	256	100.0	

Source: Survey 2018

The above shows that 106(41.4%) of the respondents replied that their organization developed strategy to mitigate value chain risks and 109(42.9%) of the respondents replied that their organization did not developed strategy to mitigate value chain risks. The remaining 41(16%) of the respondents replied they were not sure whether their organization developed strategy to mitigate value chain risks. Therefore from the above findings it is possible to conclude that less than half (41.4%) of tomato value actors were developed strategy to mitigate value risks.

Table 4.8 The existence of alternative strategy to mitigate value chain risks

Do you have other strategies to deal with suppliers who are not willing to partner with you		Frequency	Valid Percent	Cumulative Percent
	YES	87	35.5	35.5
	NO	110	44.9	80.4
	NOT SURE	48	19.6	100.0
	Total	245	100.0	

Source: Survey 2018

The above table shows 87(35.5%) of the respondents replied they have their own strategies to deal with supplier for those who are were not willing to be partner in value chain and 110(44.9%) of the respondents replied they have no

strategies to deal with supplier for those who were not willing to be partner in value chain. The remaining 48(19.6%) of the respondents' were not sure whether they have been used any strategies for suppliers not willing to form partnership to reduce value chain risks. Thus from the above results it is possible to conclude that in selected three woredas' greater proportion of tomato value chain actors were not use any alternative strategies for suppliers unwilling to make partnership.

Table 4.9 The Availability of shared data/information

From a risk perspective, how effectively availability of shared data/information is managed?	Frequency	Valid Percent	Cumulative Percent
Very effectively	85	32.2	32.2
Effectively	33	12.5	44.7
Not effectively	85	32.2	76.9
Do not know	61	23.1	100.0
Total	264	100.0	

Source: Survey 2018

The above table indicated that to what extent available information or data was shared to manage risk along tomato value chain. Accordingly 85(32.2%) of the respondents' replied available information or data was very effectively shared to manage risk.33(12.5%) of the respondents' replied available information or data was effectively shared to manage risk along tomato value chain.85(32.2%) and 61(23.1%) of the respondents' replied that available information or data was not effectively shared to manage risk and they did not know about the availability of information or data to manage risk along tomato value chain. Therefore from the above results it is possible conclude that there is no available information or data to manage risk along tomato value chain since more than half of the respondents' replied not effective and do not know in their responses'.

4.2 Analysis on Tomato Value chain risk Management elements

This part of the paper deals with risks associated with tomato value chain in east showa zone. The data was collected from three potential tomato producing woredas' For this study the internal value chain factors that affect tomato value chain actors performance were analyzed. To indicate level of importance of each factor that affects value chain risks the respondents were requested to rank in three likert scale ranging from 1(low importance) to 3 (high importance) and the results are presented below

Table 4.10 Analysis on internal risks in Tomato Value chain

Risks of the internal factors	N	Min	Max	Mean	Std. Deviation
Complexity of internal logistic chains (many processes, flows, components),	262	1.00	3.00	2.01	.88405
Low quality against negotiated requirements	258	1.00	3.00	1.99	.91464
Unreliability of manufacturing facilities, storage	254	1.00	3.00	1.94	.91753

systems, information systems					
Error rate of employees in the manufacture, warehouses, and by maintenance	263	1.00	3.00	1.84	.88371
Dependency of processes on the know-how of several key employees	266	1.00	3.00	1.70	.87726
Financing of operations	266	1.00	3.00	1.52	.79243
Over all Mean				**1.83**	

The above table shows risks associated with internal factors that have importance for tomato value chain actors. Accordingly financing operations have low mean value (1.52) which indicates it has low importance for managing value chain risk and overall mean value (1.83) indicate that internal factors have medium importance to manage value chain risks. Therefore from the above findings it is possible to conclude that in selected woredas' Tomato value chain actors were given moderate attention to internal factor related risks.

4.3 The relationship between value chain management and internal value chain risks

According to Stevens (1996) recommendation for social science research, about 15 subjects per independent variable are required for a reliable result. Hence for four independent variables used in this study, the minimum required sample size should be 60 (15 x4). Tabachnick and Fidell (2001) again gave another alternative formula for calculating sample size required, taking into account the number of independent variables to be used: $N > 50 + 8m$ (where m = number of independent variables). Therefore, for the four independent variables, a sample size could be atheist 82 (50 + 8x4). Hence, 68.5% response rates is above the requirement of the aforementioned method to compute multiple linear regression. Multivariate regression analysis is appropriate for examining the simultaneous impact of many independent variables on the dependent variables. Therefore, to reveal out the factors that significantly affect effectiveness of value chain risk management, multiple linear regression analysis is computed in the following fashion.

Table 4.11 Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.686	.190		8.887	.000		
DS	-.098	.092	-.068	-1.063	.289	.791	1.265
SS	.214	.111	.166	1.923	.056	.432	2.314
IF	.305	.094	.294	3.260	.001	.396	2.525
EF	-.008	.111	-.006	-.068	.946	.489	2.044

a. Dependent Variable: RM

From the four independent variables supply side risk and internal factors were significantly correlated with effective value chain at 10% and 5% significant level respectively. Therefore internal factors were significantly and positively influence effective risk management.

Table 4.12 Correlations

		DS	SS	IF	EF	VIF
DS	Pearson Correlation	1	.457**	.350**		1.265
	Sig. (2-tailed)		.000	.000	1.265	
	N	266	266	265	2.314	
SS	Pearson Correlation	.457**	1	.700**	2.525	2.314
	Sig. (2-tailed)	.000		.000	2.044	
	N	266	269	267	VIF	
IF	Pearson Correlation	.350**	.700**	1		2.525
	Sig. (2-tailed)	.000	.000		1.265	
	N	265	267	271	2.314	
EF	Pearson Correlation	.222**	.598**	.691**	2.525	2.044
	Sig. (2-tailed)	.000	.000	.000	2.044	
	N	265	267	271	272	

**. Correlation is significant at the 0.01 level (2-tailed).

As it is shown in the above matrix, the correlation coefficients among all the variables are less than 0.9 which implies multicollonearity does not exist among the four independent variables. Also Variance inflation factor (VIF) is the measure of the speed with which variances and covariance increase and it is the most commonly used method for detecting multicollinearity problem. There is no formal cutoff value to use with the VIF for determining the presence of multicollinearity but Neter, Wasserman and Kutner (1990) recommended, looking at the largest VIF value. A value greater than 10 is often used as an indication of potential multicollinearity problem. If VIF < 10, no multicollinearity problem, therefore, the study had no multicollinearity problem as VIF < 10, as shown in the regression table below

Table 4. 13 Summary of Hypothesis Testing

Hypothesis	Finding
1. Favorable internal factors increase effectiveness of value chain actors	Supported

4.4 Discussions

The study reveals out that internal factors affect risk management positively and significantly. Therefore, to reduce value chain risks, controlling internal factors such as internal logistic chains, quality of material used, reliability of manufacturing facilities, storage systems and information systems should be given attention to reduce risks in the Tomato value chain risk. This is consistent with study conducted by Teeratansirikool, Siengthai, Badir, &Charoenngam (2013) that internal process affect value chain actors' influence competitive strategies positively and significantly enhance firm performance. Khan &Pillania (2008), argued that supplier evaluation, strategic supplier partnership, sourcing flexibility and trust in value chain members have a significant effect on supply agility and firm's

performance. Qrunfleh&Tarafdar (2014) posits that in small firms, efficient value Chain integration plays a more critical function for sustainable performance improvement, while, in large firms, the close interrelationship between the level of VCM practices and competition capability have more significant effect on performance improvement.

Li, Ragu-Nathan, Ragu-Nathan, &SubbaRao (2006)in their study they conceptualized on five dimensions of SCM practices (customer relationship, quality of information sharing, strategic supplier partnership, level of information sharing, and postponement) and tested the relationships between competitive advantage, SCM practices, and organizational performance. Their results indicate that higher levels of SCM practices can lead to improved competitive advantage and enhanced firm performance.

5. Conclusion

The finding shows that in selected three woredas' the value chain actors were not using efficient risk management program and they did not use risk assessment methods to minimize risks in the chain. Most of Tomato value chain actors were not designed frameworks to identify possible risks and also they were not concerned about value chain risks. As per the findings more than half(51.5%) of chain actors were not made preliminary discussion to minimize value chain risks which indicates lack of cooperation and coordination among value chain actors is to minimize value chain risks. Almost half (50%) of tomato value actors in selected woredas' were not integrate risk management activities in their usual businesses and didn't collect related risk information from their critical suppliers. The study findings revealed that demand size risks, supply side risks, internal factor risks and external environmental elements have medium importance for respondents business activities and were not give high priority to manage and controlled risks associated with these factors. Specifically the respondents believe that financing operations have low importance to manage value chain risks. The regression model show that internal factors were significantly and positively influence effective risk management

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