

**YANGON UNIVERSITY OF ECONOMICS**  
**DEPARTMENT OF MANAGEMENT STUDIES**  
**MBA PROGRAMME**

**INNOVATION AND PERFORMANCE IN MYANMAR**  
**PLASTICS MANUFACTURING FIRMS**

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**MBA II – 30**

**MBA 25<sup>th</sup> BATCH**

**JULY, 2022**

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**ACADEMIC YEAR (2019 – 2022)**

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This thesis submitted to the Board of Examiners in partial fulfilment of the requirements for the degree of Master of Business Administration (MBA)

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**JULY, 2022**

## ACCEPTANCE

This is to certify that the thesis entitled “**Innovation and Performance in Myanmar Plastics Manufacturing Firms**” has been accepted by the Examination Board for awarding Master of Business Administration (MBA) degree.

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## **ABSTRACT**

The purposes of this study are to examine the effect of personal and organizational factors on creativity, the effect of creativity on innovation, and the influence of innovation on performance of Myanmar plastics manufacturing firms. The study applies both descriptive and analytical methods to achieve study objectives. The survey results indicate that both personal and organizational factors have effect on creativity. Personal factors of creative self-efficacy and risk-taking are the most influencing on creativity. Also, organizational factors of structure and atmosphere are most effecting on creativity. The results of the study indicated that creativity has positive effect on innovation. Finally, innovation has positive effect on performance of the Myanmar plastics manufacturing firms. The study suggests that in order to foster performance, Myanmar plastics manufacturing firms should focus on innovation. Moreover, in order to increase innovation, creativity is the baseline.

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# **CHAPTER 1**

## **INTRODUCTION**

Social trends in almost every societies are changing rapidly. Consumers are expecting and demanding innovative offerings in both products and services. So, in today's competitive worlds, manufacturers and service providers have concern about consumer sensitivity and want to create innovative products and services in order to cope and survive in market competition, to meet consumers' need and want and to get customer satisfaction and competitive advantages. Nowadays, manufacturers are putting their effort to introduce new products, to apply new manufacturing processes and to manage new marketing styles. In developed countries, manufacturing firms are mostly relied on advanced technology and high capital investment whereas manufacturers' creative ideas and thinking are only important in developing countries for economic development.

Manufacturing firms which can convert manufacturers' creative ideas and thinking to real innovation are more successful. Also manufacturing industries are encouraged to develop innovation in Union of Myanmar, for example, wood-based industries, handmade industries, traditional medicine industries and now, plastics industries.

In past, most of the plastics products are imported. Today, Myanmar people are willing to use local made plastics products since import products have different qualities based on countries so quality is low although value of products and additional costs to import to Myanmar such as transportation charges are high. Plastic manufacturing firms are well-known and developed rapidly since 1995 because of the support of government and government has concern about waste management now. Myanmar plastics industry association was also established in 1995.

The current demand of plastics products are rising in market so manufacturers must focus on creative ideas and innovation not only in their products but also manufacturing processes and marketing style. Now, Myanmar plastics firms are creating products under standard of GMP (Good Manufacturing Practices), ISO, manufacturing licenses approved by the Directorate of Industrial Supervision and Inspection (DISI) which is one of the departments of Ministry of Industry established in 2014 and Myanmar Plastic Industry

Association's permit. These market acceptance and local customer base are the result of creativity and innovation of Myanmar plastics manufacturers.

## **1.1 Rationale of the Study**

Currently Myanmar Plastics Industry is least developed in Southeast Asia although the demand is higher and higher dramatically. Market information is spread unsystematically and uncontrollable. The applied technology and financial investment are almost same for plastic manufacturers. Therefore, creativity and innovation play a vital role for the success of Myanmar Plastics Industry. However, there are many opportunities for Myanmar Plastics Industry for development. The market value of Myanmar Plastics Industry was over USD 800 million in 2020 and market is projected more than 6% during the forecast period 2021 to 2026 according to the Myanmar Plastics Market Research. The market demand for Myanmar plastics industry is more than double of supply. Although the demands are increasing day by day, the supply can't meet the requirement amounts. Myanmar Plastics Industry Association has signed memorandum with Malaysia for farther investment. Plastics manufacturing companies which apply their creative ideas to produce innovative products can acquire more market shares. Since Myanmar is one of the developed countries, innovation in plastics industry doesn't mean the newest products in all over the world. Innovation is based on imitation, however, this creativity and innovation lead to local plastics so it can reduce shipping costs of importing, minimize global price fluctuation, exchange rate and interest rate and increase GDP per capita.

The successful manufacturers are able to develop new ideas and reveal problems and opportunities. That ability is known as creativity and so creativity means "thinking new things new ways". Also, transforming and converting this great idea to tangible product or service is also needed to be successful in the market. That why, manufactures need innovation which is the ability of applying creative solutions to solve problems and enhance opportunities. So, innovation means "doing new things" (Zimmerer, 2008). Therefore, creativity is important and essential for innovation and innovation is the key to succeed in Myanmar plastics manufacturing firms. The success of Myanmar plastics manufacturers depend on manufacturers' great ideas and ability to transform the idea into economic reality.

Innovation theory stated that there are various factors which have effect on innovation and innovation can increase performance, profitability and growth of the firm. So, many researchers applied this innovation theory and have identified determinants of creativity and innovation in many manufacturing industries. They also found the relationship between creativity, innovation and performance in various manufacturing sectors.

Plastics firms in all over the world face resource constraints since raw material come from the residues of petroleum. According to Kim et al. (2008) and Nohria and Gulati (1996), input constraints breed complacency. Baer and Oldham (2006) and Ohly and Fritz (2010) stated that input constraints motivate risk-taking and experimentation. Baker and Nelson (2005) found that this can lead to maximize creative value which come from available resources, to look for new combinations with resources in hand and to think beyond the traditional solution. So, creativity and innovation play vital role in development of Myanmar Plastics Manufacturing Sector.

In Myanmar, there are not more than five of general researches for Myanmar Plastics Sector and no research which investigate the relationship between creativity, innovation and performance in Myanmar Plastics Industry. Myanmar plastics manufacturers' creativity and innovation can help to gain high market acceptance Therefore, this thesis would fill the gap by investigating factors of creativity and innovation of Myanmar plastics manufactures and the relationship between creativity, innovation and performances of Myanmar plastics manufacturing firms.

## **1.2 Objectives of the Study**

The main objectives of the study are:

1. To analyze the effect of personal and organizational factors on creativity in Myanmar plastics manufacturing firms
2. To examine the effect of creativity on innovation in Myanmar plastics manufacturing firms
3. To investigate the influence of innovation on performance in Myanmar plastics manufacturing firms

### **1.3 Scope and Method of the Study**

This study focuses on creativity and innovation of Myanmar Plastics Manufacturing Industry. To collect the primary data from Myanmar plastic manufacturers, survey with structured questionnaire to the owners or top management of sample firms is applied and the sampling frame is set. According to the data of Myanmar plastics industry association, there are 233 plastic manufacturing firms in Myanmar (MPIA, 2022). They got the GMP licenses for production of plastic manufacturing. The 206 out of 233 (about 88%) are located in Yangon City and the other 27 firms are located in the rest states and divisions throughout Myanmar (MPIA, 2022). Yangon City is the most populated area of plastic manufacturing firms. There are still many others plastic manufacturing firms but they do not have license and MIC permit from Myanmar Plastic Industry Association. That why, the sample firms are selected as sample frame from the above 233. In order to get sample size, this thesis uses Rao Soft sample size calculator. By using Rao Soft Formula with 95% confident level and 5% margin of error, it gets the sample size of 146 firms. This thesis applies probability sampling technique namely simple random sampling. So, 233 firms are assigned numbers from 1 to 233 and make it in computer program. From this numbers, the 146 numbers are selected through computer program. Then these selected 146 firms are received questionnaires. Likert scale questions are used for the survey. Secondary data are collected from the record of Myanmar Plastics Industry Association, published journals, previous research papers, international thesis, Internet websites, relevant textbooks and the organizations.

### **1.4 Organization of the Study**

This study includes five chapters: Chapter 1 is the introduction, rationale of the study, objective of the study, scope and method of the study and organization of the study. Chapter 2 describes theoretical framework of creativity, innovation, antecedent factors and effect of creativity and innovation on firm performance. Chapter 3 explains the general overview on Myanmar plastics manufacturing firms. The history and development of Myanmar Plastics Manufacturing Sector, the assistance of government to Myanmar plastics manufacturers and the contributions of innovative Myanmar plastics manufacturers. Chapter 4 describes the results of analysis conducted on demographic profile, creativity, innovation, antecedent factors, the effect of creativity on innovation and the effect of

innovation on firm's performance. Chapter 5 represents findings and discussion, conclusions, suggestions and recommendations of Myanmar plastics manufacturing firms.

## CHAPTER 2

### THEORETICAL BACKGROUND

This chapter presents the theories and concepts that develop the conceptual framework of the study. The objectives of this chapter is to explore theories and concepts of creativity, innovation, firm performance and the personal and organizational factors which nurture creativity and innovation. The chapter concludes with literature review of previous studies and then conceptual framework is resulted.

#### 2.1 Concept of Creativity

Zimmerer (2008) pointed that creativity can develop new ideas and reveal new ways to solve problems and to gain opportunities so that it can upgrade human's life. Creativity is the essential first step in innovation, and it is vital to long-term success of organizations (Daft, 2003). Anderson et al. (2004) stated that creativity is almost complete uniqueness, while in innovation is related to newness such as the application in a new or different way of products, procedures, or processes which have already been used in a different place. According to Thomas (2005), creativity can be defined as thinking new things whereas innovation is doing new things.

Kampylis et al. (2014) stated that creativity is the active process which is necessarily involved in innovation. According to Amabile et al. (1996), creativity known as creative ideas is the start of innovation. At the time of Schumpeter, there was an argument that invention and innovation are closely linked and not distinguishable. However, Fagerberg (2005) described that invention concept is the basis of innovation concept so innovation arises when someone uses invention. Moreover, many researchers have been presented that creativity is known as idea conception. Creativity can enhance innovation process in the way of modern economy (Florida, 2003). Creativity supports new ideas for new products and service known as innovation which will be valued and exclusive in the market (Christiansen, 1999).

Heunks (1998) stated that creativity is different thinking to generate new ideas and innovation is the accomplished technical and or economical achievement of a creation. Sternberg et al. (2013) claimed that creativity needs ability to produce novel outcomes with



high quality which are appropriate to the task. Cropley and Cropley (2010) also agreed this concept and described as effective novelty generation. Woodman et al. (1993) claimed that creative outcomes can be in the form of ideas, products, services, processes or procedures. Carnevale (1990) pointed that creativity forces innovation not only by depending on the individual and organizational skills required to be adaptable with changes in the modern world but also by performing as key feature in processing new opportunities. Puccio and Cabra (2010) supported that both individual and organizational creativity are vital in generating innovation.

### **2.1.1 Process of Creativity**

Wallas (1926) stated that there are five stages in creativity process and each of these steps should be done properly.

- (1) Preparation: brainstorming, information gathering, idea generation, investigation and solution seeking.
- (2) Incubation: take a break or let the mind work to go on the process unintentionally.
- (3) Illumination: all the previous stages are collaborated to create innovative ideas in this stage and when an individual is not necessary to think about the problem and relax mind.
- (4) Evaluation: this stage can be defined as consideration of the idea's validity and comparison with alternatives.
- (5) Implementation: finalize the design, bring the idea into real life and transform idea into reality.

The stages of creative process are slightly different depend on each author but they are almost the same. Thomas (2006) presented there are only four stages in creative process such as preparation, incubation, illumination and verification. Thomas (2005) described that there are seven stages in creative process: preparation, investigation, transformation, incubation, illumination, verification, and implementation.

## **2.2 Concept of innovation**

Innovation can be described as transformation of explored new ideas into creation of new product, process or service. Almost every successful firms accept that innovation is

the heart of a business and key to success. According to the innovation theory, various factors are stimulating and promoting innovation and that innovation can lead to performance, profit and growth of the firms. Innovation is the successful implementation of creative ideas and innovation leads to greater performance in different perspectives(Hennessey & Amabile, 2010).

According to Schumpeter (1934), innovation is creative destruction and innovation can be described by five aspects (a) introduction of new good: which means new quality of good or goods which are not familiar to customers, (b) introduction of new production method: which means new style of supervising a product commercially and new technology, (c) opening of a new market: which means both a market which never exist before and a market which have already existed but enterprises have not entered yet, (d) searching new source of supply: where new supply means not only freshly created but also existed but not used yet and (e) implementation of the new organization of any industry or market. Tang and Xi (2005) summarized Schumpeter's innovation theory into five types of innovations as product, process, marketing, allocation of resource and organization.

Recently, Bessant and Tidd (2007) pointed out that innovation is not only generating new ideas but also implementing these ideas into useful practices. Unlike Schumpeter theory, Bessant and Tidd (2007) describes 4Ps innovation, (1) product innovation- change in product and or service, (2) process innovation- change in the ways of products/service are created and delivered, (3) position innovation- change in the context where products/service are introduced and (4) paradigm innovation- change in primary mental models which guide organization behaviors.

Innovation becomes a key factor in recent years: at macro level, innovation is important to meet and scope with the challenges of 21<sup>st</sup> century such as social change, technological advance and globalization, and at micro level, innovation plays a vital role to gain organizational effectiveness and competitive advantages (Davis, 2009).

### **2.2.1 Product Innovation**

The meaning of product refers to both goods and services. Polder et al. (2010) defined that product innovation is the introduction of new products/services or improvement of existing products/services. Improvement includes features, software,

intended use, components or materials. Product innovation can apply new usage of not only existing knowledge and technology but also fresh knowledge and technology. Product innovation is quite difficult since it is driven by technology advance, change in customers' needs, wants and preferences, active global competition and decrease in product life cycle. Oecd (2005) pointed that change in design can change the use and characteristics of the product can also be regarded as product innovation. Product innovation can provide success, customers' satisfaction, competitive advantages and efficacy to the firms (Polder et al., 2010).

Roberts (1999) described that at the introduction stage, product innovation helps to face only low competition and so it can earn high profit. According to the studies found by Ettlíe and Reza (1992), new product development and product innovation has positive effect on market shares and firm's performance. Olson et al. (1995) stated that product innovation can be distinguished into three types: (1) product line extension, (2) me-too products and (3) new and fresh to the world products. Hauser et al. (2006) also explained that product innovation is one of the key factors for long-term survival of the firms. Therefore, many researchers have been claimed that product innovation is focused on market, important to increase firm's performance, market shares, profits, competitive advantage and long-term existence.

### **2.2.2 Process Innovation**

Process innovation is new or significantly improvement of production or delivery method such as change in techniques, software and or equipment. Oecd (2005) stated that process innovation can reduce cost per unit in production and delivery, increase quality of the products, improve new products and effective and efficient in both production and distribution. Damanpour and Gopalakrishnan (2001) proved that although product innovation depends on market, process innovation is more concerned internally. Process innovation is purposeful and new organizational efforts to shift the processes of production and service (Baer & Frese, 2003). In the other words, process innovation can be defined as searching different and unique way of gaining an output which is quite distinct with traditional way. Therefore, output products may be original but the practice of bring out the output becomes advanced due to new technology and or equipment.

Process innovation mostly occurs when a business needs radical different way of process which can provides expected benefits and or when a business face a problem with existing process. However, many researchers have been claimed that process innovation also depends on progression and nature of the production method. Process innovation can support value for both forwards and backwards integrations including employees, organization itself, suppliers, business partners and customers and it can help to smooth the activities of purchasing, maintenance, accounting and computing (Polder et al., 2010). Olson et al. (1995) pointed that most of the firms implement process innovation with the aim of decreasing unit cost of production. Moreover, Ettlíe and Reza (1992) showed that process innovation has a strong positive effect on efficiency and productivity of the organizations.

### **2.3 Firm Performance**

Firm performance is the goal complement or outcome that gain when internal and external objectives are accomplished (Achrol & Etzel, 2003). Bonn (2000) stated that performance can be regarded as mirror of the firm and outsiders measure the value and success of the firm by performance. Good performance can bring survival, growth, success and competitiveness for firms (Wolff & Pett, 2006). The firm's growth concept is known as the "Law of Proportionate Effect" appeared in 1930s (Gibrat, 1931). Trau (1996) also pointed that good performance can maximize profits of the firms. (Sohn et al., 2007) claimed that firm performance is multifaceted and indicators for the firm performance can be departmental.

Firm performance can be measured in subjective and objective indicators (Harris, 2001). Also, indicators can be divided into financial and non-financial terms (Bakar & Ahmad, 2010). Firm performance also depends on the industrial structure (Frazier & Howell, 1983). Marcus (1988) explained that firm performance also depends on resources and capabilities which can provide competitive advantage. Strategies applied by firm have direct effect on firm performance (Collins, 2005). Garrigós-Simón and Palacios Marqués (2004) described that firm performance is mostly and commonly measured by profit, revenue, growth, stakeholder satisfaction, market share, sale volume, productivity, number of new items and competitive position.

## **2.4 Antecedent Factors**

There are personal and organizational factors which can influence on both creativity and innovation. Nine personal factors and six organizational factors are selected.

### **2.4.1 Personal Factors**

Heunks (1998) stated that leadership, risk taking and future orientation are personal backgrounds which can influence creativity and innovation. Amabile (1988) also pointed that personal factors of creative self-efficacy, problem identification, information searching and encoding, idea generation, problem solving and intrinsic motivation can promote creativity and innovation. Chinelato et al. (2015) described that creativity is strongly connected with personality traits which consist of workplace innovation, emotional stability, high empathy, self-efficacy, taking risks and intrinsic motivation.

#### **(1) Creative Self-Efficacy**

The theory of creative self-efficacy includes different perspectives of self-efficacy and creativity. The greater the self-efficacy of one, the bigger performance and better outcome. Creative self-efficacy is also known as the belief in one ability to explore creative results (Tierney & Farmer, 2002). Choi (2004), Egan (2005) and Lemons (2005) have been proved that one's creative self-efficacy depends on his/her personality and it is one of the essential personal factors which promotes creativity and innovation.

#### **(2) Problem Identification**

Problem identification can be described as the act of defining the problem. It is the first step of systematic process to solve a problem or to develop the progress. Amabile (1988) stated that problem identification is one of the personality traits which can support creativity and innovation.

#### **(3) Information Searching and Encoding**

Harms (2020) claimed that a person who faces a problem, the more efficiently and effectively searching information, the more creative solutions he get. A person who does not give time in information searching and encoding will not perceive creative outcomes. That why, Amabile (1988) defined that the personal factor of information searching and encoding is essential for creativity and innovation.

#### (4) Idea Generation

Idea generation can extend the range of idea beyond normally we can and it is the act of forming ideas. It can be regarded as creative process since it can develop new thoughts and concepts and it is the basis of innovation theory (Amabile, 1988).

#### (5) Problem Solving

Pehkonen (1997) stated that the personal characteristics of problem solving can encourage creativity and innovation by mean of creative thinking. Many researchers have been found that problem solving can generate numerous ideas and different perspective of solution which are sometimes differ from traditional ways and stimulate creativity and or innovation.

#### (6) Intrinsic Motivation

Intrinsic motivation plays as an indicator of difference between successful and unsuccessful attempts at creativity (Amabile, 1988). Many researchers have claimed that intrinsic motivation is most important personal factor which stimulates creativity. Moreover, creativity theory of Heunks (1998) also pointed that intrinsic motivation is essential for individual creativity.

#### (7) Leadership

According to Thomas (2006), the creative and innovative leader must have the ability of defining the tasks, planning, briefing, controlling, evaluating, motivating, organizing, supporting and setting example or sample. A leader must communicate well with all team members, listen to them and apply useful ideas and information from them, guide them and reward and appreciate to them.

#### (8) Risk Taking

The characteristics if risk taking person are addicted in challenges, unconventional, love to take risks and think differently with others (Heunks, 1998). Wiklund and Shepherd (2005) explained that risking taking is taking action of uncertainty, carrying out resources even outcome is unknown and or failure probability is high. Hughes and Morgan (2007) described that risking taking behavior can stimulate creativity and innovation and lead to greater performance. According to Erbas and Bas (2015), personality of risk taking is positively related to creativity.

#### (9) Future Orientation

Future orientated person always concerns about the future, consequences of each action and always plans ahead before performing. Moreover, this kind of individual values long-term success and achievement. Three factors of expectation, aspiration and planning is always influenced in future oriented person (Heunks, 1998).

### **2.4.2 Organizational Factors**

Organizational characteristics such as structure, organizational support and culture which in the style of exploitative may help to be creative and innovative in the organizations (Woodman et al., 1993). According to Amagoh (2008) and Schneider and Somers (2006), workplace atmosphere has direct effect by fostering or inhibiting on creativity of employees in this organization. Amabile (1988) stated that some organizational factors including communication and organizational creativity play important role in stimulating and promoting creativity and innovation.

#### (1) Structure

Kanter (1983) defined that matrix organizational structures are associated with creative ideas and innovative performance. Damanpour (1991) explained that the organizational structures of functional differentiation, specialization and open type have positive effect on creativity. fyvie and Ager (1999) also pointed that flat structure organizations with not too much hierarchy are more creative and innovative. And then, Henry (1992) found that organizations with too many hierarchical structures, strict rule and over control are inhibited to be innovative. Daft (2003) found that creative organizations have loosely organizational structures and internal culture is designed with full of playfulness, freedom, challenge, and gross-roots participation (Khandwalla, 2003).

#### (2) Communication

Woodman et al. (1993) claimed that group creativity and innovation are boosted by a great interaction between themselves, with customers and suppliers and even with competitors. An open and friendly communication channels within employees can significantly increase not only employees' job satisfaction and motivation but also creative and innovative performances. Moreover, many researchers have been claimed that employees who can consult with subordinates and or supervisor can creative more creative

ideas and different perspectives. Also, Smirnova et al. (2009) stated that stakeholder's involvement in innovation-related processes can change firm's business model in positive way and can achieve competitive advantage in Russia.

(3) Atmosphere

Internal working atmosphere will be conducted with creative and innovative thinking by the help of supportive environment which can foster the growth and success of diverse workforce (Kuratko et al., 2014). Lee and Brand (2005) and Rothe et al. (2012) also claimed that a pleasant workplace atmosphere which aligned with the need of organization can enhance employees' job satisfaction, creativity and productivity.

(4) Organizational Creativity

According to Amabile (1988), organizational creativity is explored by organizational encouragement, supervisory encouragement and work groups support. An organization which prefer creative ideas, offer rewards and recognitions for creative work, develop active flow of idea and share vision can be defined as organizational creativity.

(5) Organizational Support

Mumford et al. (2002) described that organizational support especially time and resources can dramatically improve employees' creative performances. Amabile (1988) also stated that people can do more creative work when there is support from the organization.

(6) Exploitative Culture

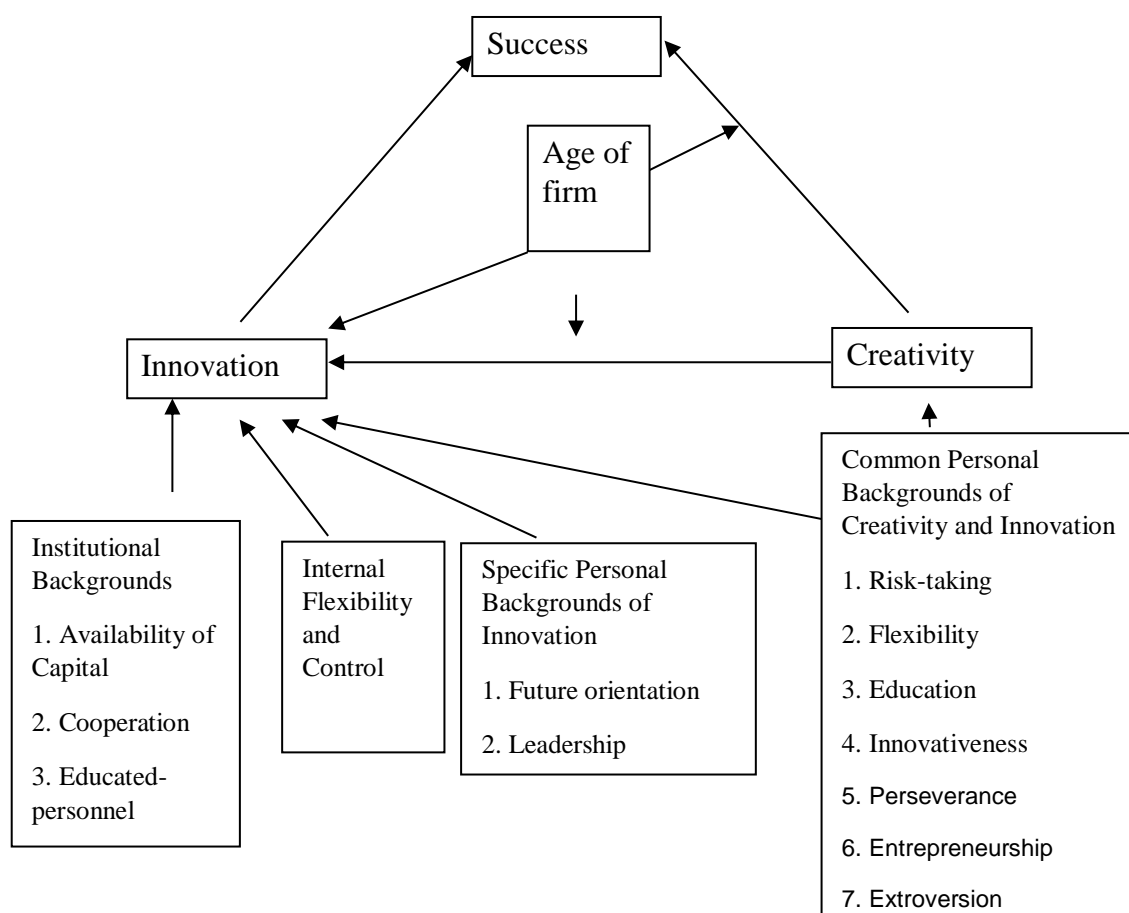
An organization which has exploitative culture do refining, improving and implementing small adaptation and expand clients for existing products and services and this organizational culture can enhance creative nature (Kirmani, 2021).



## 2.5 Review of Previous Studies

Heunks (1998) defined that factors which can increase and promote creativity and innovation can be distinguished into personal backgrounds, institutional backgrounds and firm's flexibility and control. This categorization is more suitable for small and medium enterprises' entrepreneurs in developing countries. Heunks (1998) examined a framework as follow which explain the factors that foster creativity and innovation focusing on the success of entrepreneurs in the developing countries. According to this research finding, creativity and innovation share some common personal factors such as risk-taking, flexibility, education background, innovativeness, perseverance, entrepreneurial competencies, and extroversion whereas there are some specific personal factors in innovation including future orientation and leadership. Moreover, innovation is also associated with some institutional factors of are availability of capital, information, cooperation, and educated personnel. Internal flexibility and control also have effect on innovation.

**Figure (2.1) Conceptual Framework of Heunks**

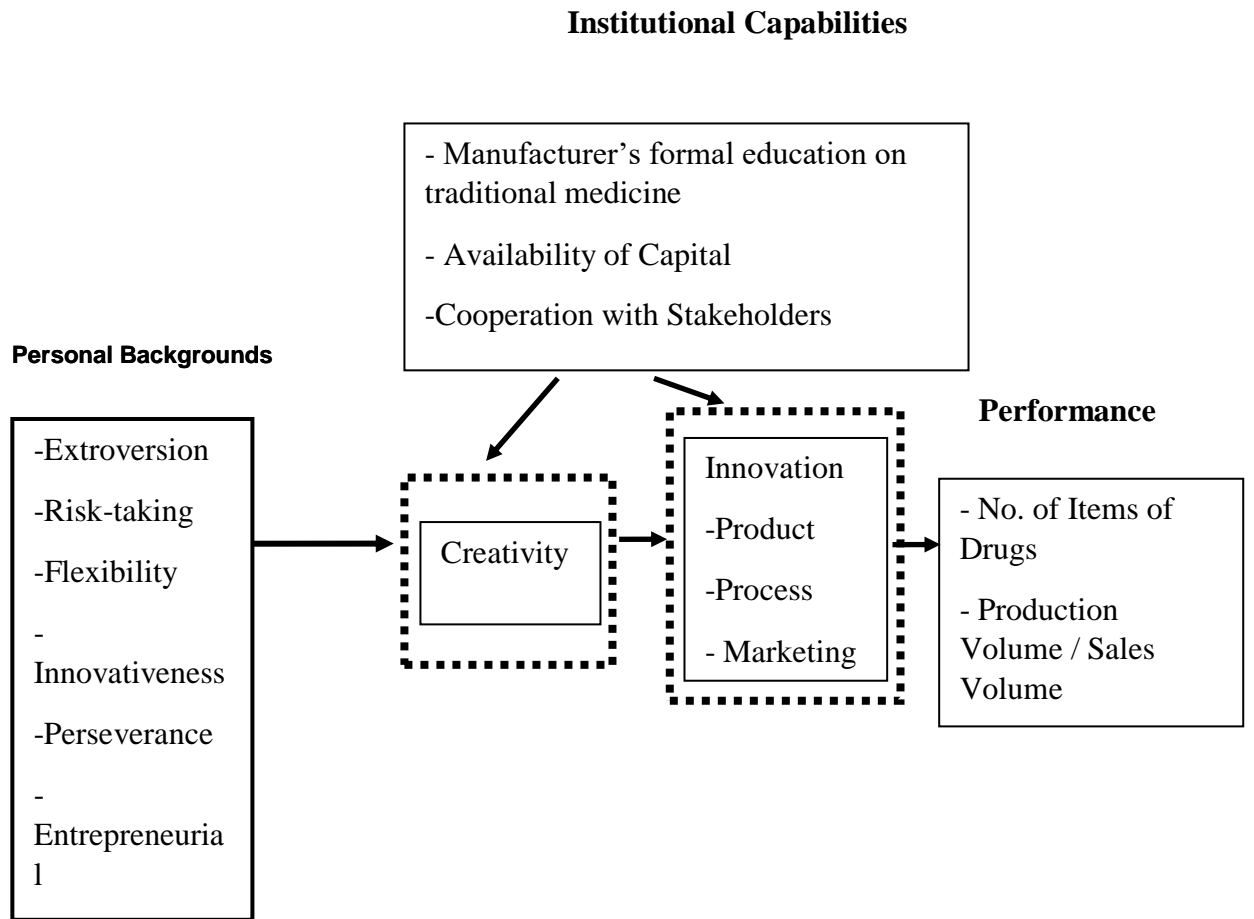


Source: (Heunks, 1998)

Kyi (2010) examined that personal backgrounds and institutional capabilities can boost creativity and innovation in manufacturing firms. This study focused on Myanmar Traditional Medicine Manufacturing Industries. The personal factors which used as measurement of creativity and innovation in this research are extroversion, risk-taking, flexibility, innovativeness, perseverance, leadership, future orientation and entrepreneurial competencies. Manufacturers' former education, cooperation with stakeholders, availability of capital and research and development are the applied institutional factors (Kyi, 2010).

In this study, the working definitions considered the innovation adoption concept. As major findings, the determinants of creativity of Myanmar traditional medicine manufacturers are some part in personal nature and some in the institutional nature. The personal determinants of creativity of them are risk-taking and innovativeness, and the institutional determinants are formal education of manufacturer on Myanmar traditional medicine, and cooperation with stakeholders. The determinants of innovation are only in institutional nature. Those are formal education of manufacturer on Myanmar traditional medicine, and research and development. Thus, the formal education of manufacturer on Myanmar traditional medicine is the common institutional determinant of creativity and innovation. However, the innovation stems from the manufacturer's creativity. Thus, the creativity is necessary for innovation in Myanmar traditional medicine manufacturing firms. The performance of manufacturer's performance is resulted from innovation for which the baseline is creativity. Moreover, the research also proved that creativity and innovation are positively associated with firm performance (Kyi, 2010).

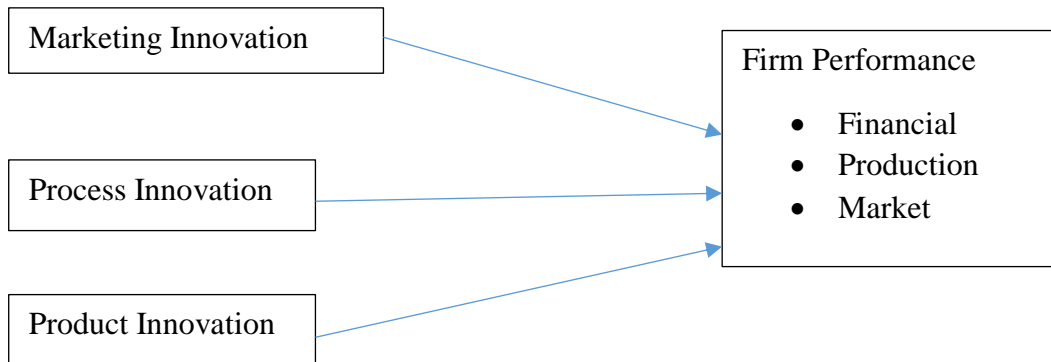
**Figure (2.2) Conceptual Framework of Kyi**



Source: (Kyi, 2010)

Zin (2018) also claimed that creativity and innovation are closely associated.

**Figure (2.3) Conceptual Framework of Zin**



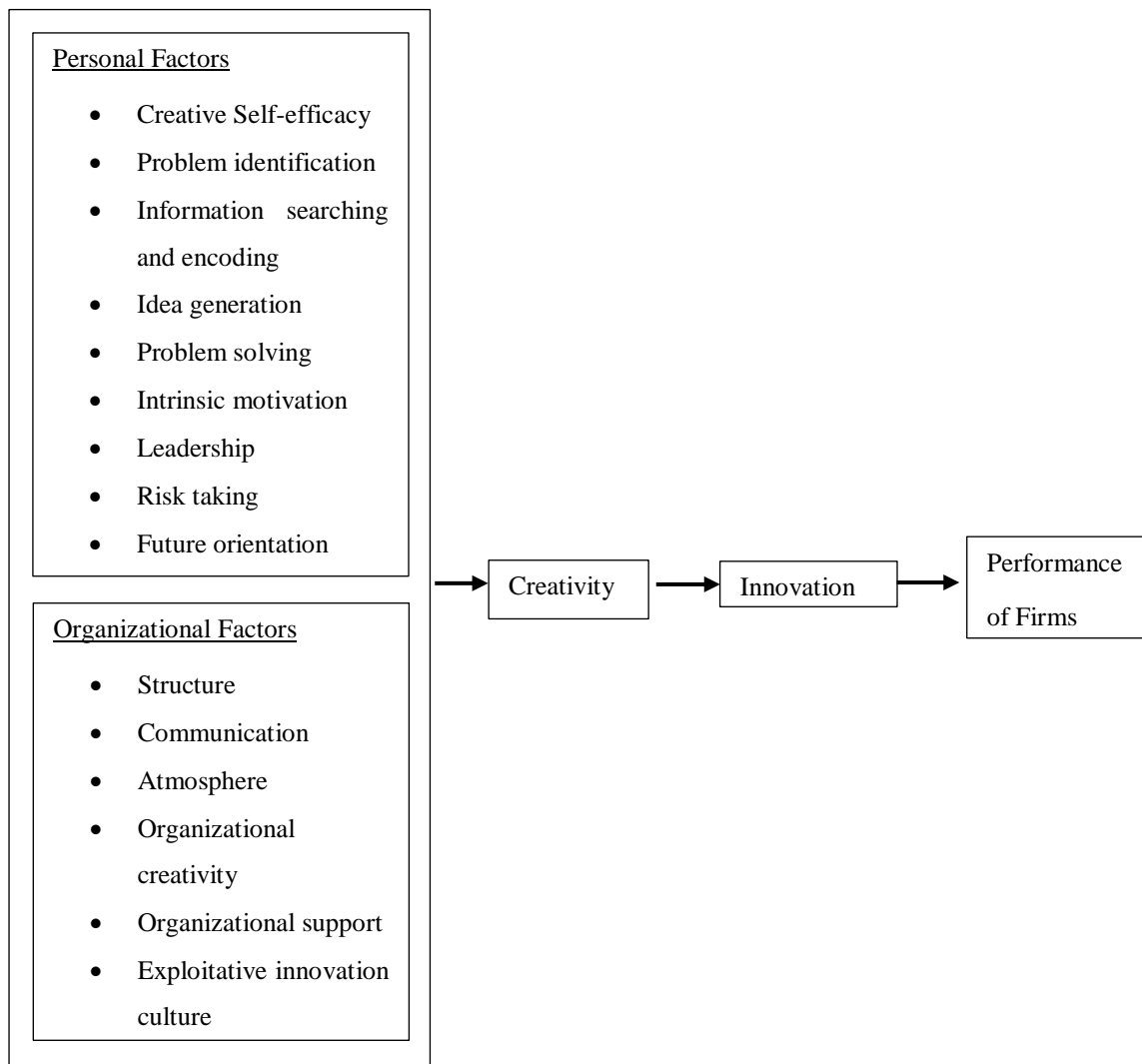
Source: (Zin, 2018)

Moreover, both marketing innovation, process innovation and product innovation can increase firm performance in term of financial, production and market dimensions including revenue, profit, production volume, sale volume and number of items.

## **2.6 Conceptual Framework of the Study**

The conceptual framework of the study is prepared according to the concept of creativity and innovation, the factors which stimulate creativity and innovation and previous research findings. The conceptual framework is designed to examine personal and organizational factors which foster creativity and innovation, the effect of creativity and innovation on performance of Myanmar plastics manufacturing firms.

**Figure (2.4) Conceptual Framework of the Study**



Source: Own Complication (2022)

In this study, product innovation and process innovation are based to measure innovation in Myanmar plastics manufacturers. To analyze the effect of creativity and innovation on performance, the five measurement are used: increase in production volume/sales volume, profit, revenue and number of new items during the last three years (2019-2021). This is because Mahemba and Bruijn (2003) pointed that time horizon to measure innovation and performance of SMEs in developing countries should be at least three years.

## **CHAPTER 3**

### **PROFILE AND OVERVIEW OF MYANMAR PLASTICS**

#### **MANUFACTURERS**

This chapter discuss about the history of Myanmar Plastics Manufacturing Sector, profile Myanmar Plastics manufacturers and overview of creativity and innovation in Myanmar plastics manufacturing firms.

##### **3.1 History of Myanmar Plastics Manufacturing Sector**

Before 1995, Myanmar plastics industry was fully controlled by the government. There was no private company which ran about plastics business at that time. From 1995 to 2000, private plastics manufacturing companies were appeared but the processes were under control of Ministry of Industry. The companies were only support manufacturing process: Ministry of Industry provided raw materials and companies transformed raw materials to finished goods and then returned back to Ministry of Industry. The companies only got the process charges and only communication and networking with government played vital role to be successful in that time. After 2000s, Myanmar plastics industry became privatization.

Currently, Myanmar Plastics Industry can play the whole supply chain process for plastics manufacturing. Although Myanmar is the least developed country in plastics sector among Southeast Asia, there are many market opportunities which can help to boost the development of Myanmar plastics manufacturing firms. For example: Myanmar gets advantage from its location because it is strategically located between the two largest emerging markets of the world: China and India. So, it can provide the advantages of low minimum wages, tax incentives and benefits of special Economic Zone.

Moreover, many Japanese plastics companies are now offering to form joint venture with Myanmar plastic manufacturing firms and will support new plastics production machines and techniques. Japanese firms usually import plastics products from Malaysia, Vietnam and China but now they are interesting in Myanmar Plastic Industry since

government removes limits and offers flexible regulations for foreign direct investments. Also based on Royal Thai Embassy (2017), Thailand establishes new policy which aims to strengthen and boost the economic partnership, to build sustainable development with Myanmar and to stimulate close working relationships between not only government sector but also private sectors of Thailand and Myanmar.

Now, government pays attention to development of Myanmar Plastics Manufacturing Sector as well as sustainable waste management. The Myanmar National Waste Management Strategy and Master Plan (2018-2030) was established. It will be developed by the coordination and cooperation of Environmental Conservation Department and other relevant departments and partners. The aim of this plan is to promote capacities, conducive policy framework and strategies to transform from traditional to sustainable waste management which depends on waste hierarchy, the 3RS (reduce, reuse, recycle) and other national environmental policies. Environmental Conservation Rules (2014) were also developed which concern with Plastics Manufacturing Sector (ECD, 2018).

### **3.2 Profile of Myanmar Plastics Industry Association**

The Myanmar Plastic Industries Association (MPIA) is the leading private sector organization of the industry, representing 1,000 units of processed plastic in Myanmar and promoting and supporting the Myanmar Plastics Industry's growth. It was founded in 1995 and at that time, there were only 15 executive members including plastics entrepreneurs, plastics raw material distributors and technicians. From 1995 to 1998, it was regarded as a cluster under Myanmar Industrial Association (MIA). After that, it was applied to Ministry of Home Affairs for the Myanmar Plastics Industries Association existence, recommended by the Myanmar Industry Association (MIA). And then, it was applied as brother association of Union of Myanmar Federation of Chamber of Commerce Industry (MPIA, 2022).

The aims and objectives of Myanmar Plastics Industry Association are:

- To create the strongest plastic production Association in Myanmar with not only manufacturers and dealers but also technicians and interested persons in plastic industry.
- To organize and manage people who include in plastic production with guidelines set by the Government.
- To include membership in ASEAN Federation of Plastic Industries and can cooperate.
- To improve qualified plastic products production and to increase new markets and to increase import substitute products.
- To be a support in development of Myanmar.
- To face the problems in the various sectors of plastic productions.
- To help and guide Myanmar plastics manufacturers.
- To found the Basic Level Associations at Townships, Districts, States and Divisions in the Union of Myanmar.
- To control standard and quality of plastic and machines in order to get the patent rights of plastic manufacturing.(MPIA, 2022)

The association develops monthly meeting, video conferencing with members, celebration and donation, sends members to training associated with plastics sectors such as “The program on Improvement of Waste Management” in Tokyo and Mumbai. Moreover, it holds several expo and exhibition with UMFCCL, other major exhibitors including Iran, Sri Lanka, Thailand and Singapore. Also, Myanmar Plastic Industries Association has its own website page and shares several knowledges and information which concern with the plastics industry and manufacturing sector. Moreover, Myanmar Plastics Industries Association could sign memorandum with Thailand, Malaysia, India and many other countries (MPIA, 2022).

The supply chain aids the transfer and transformation of raw material into finished goods in product manufacturing. The final goal of every supply chain is to receive customer satisfaction. In most manufacturing sectors, each player facilitates separate defined role, for example, supplier, manufacturer, distributor, wholesaler, retailer, exporter etc.



**Table (3.1) Numbers of Plastics Manufacturing Firms in MPIA**

<b>Region</b>	<b>No of plastic firms</b>
Yangon	206
Mandalay	16
Ayarwaddy	3
Bago	3
Nay Pyi Taw	2
Shan	3
Total	233

Source: MPIA (2022)

According to the manufacturers data of MPIA (2022), there are 233 plastics manufacturing firms in Myanmar which are also members of Myanmar Plastics Industry Association. In Myanmar plastics manufacturing sector, key players are importers, giant suppliers, supplier manufacturers, manufacturer retailers and manufacturer exporters. Unlike other manufacturing sectors, plastics manufacturers play not only manufacturer role but also supplier, wholesaler, retailer or exporter role. There are no specific data for the numbers of each manufacturing group. That's why, respondents of this survey will include all types of manufacturers. Supplier manufacturers supply raw materials both for its own use and for other manufacturers. Manufacturer retailers not only process production but also sell its own finished goods in wholesale or retail at its own showrooms. Manufacturer exporters perform production and exporting to Thailand, Malaysia, and Laos etc.

### **3.3 Overview of Creativity and Innovation in Myanmar Plastics Manufacturing Sector**

Although Myanmar is least developed country in plastics manufacturing sector among ASEAN countries, we can see many developments which depend on creativity and innovation compared to the past. The role of manufacturers is developed since 2000. At present, Myanmar plastics manufacturers can produce different kinds of plastics products and according to Myanmar Plastics Market Report by Mordorintelligence (2020), plastics market can be distinguished into three segmentations in Myanmar: Type (Bioplastics,

Traditional Plastics and Engineering Plastics), Application (Housewares, Automotive and Transportation, Packaging, Building and Construction, Furniture and Bedding, Electrical and Electronic and Other Applications) and Technology (Injection Molding, Blow Molding, Extrusion and Other Technologies). Among them, packaging sector is the market dominator of Myanmar Plastics Market. Moreover, bio plastics market tends to expend more in the future. Bioplastics can be defined as bio-based plastic-like materials which can be made from renewable materials: for examples, corn, potato, cereals, sugar cane, and other vegetables. The bioplastics market in Myanmar mainly depends on major crops like corn and other plant oils. Bioplastics are 100% recyclable, and their prices are not dependent on fuel.

Before 2000, the manufacturing processes are fully under control of government. But now, the supply chain of plastics manufacturing process is well developed. Manufacturers play not only manufacturer role but also other role of supply chain. In past, raw material importing is one of the duties of Ministry of Industry. But now, manufacturers can get and choose raw material of various countries and different qualities from Myanmar plastics supplier manufacturers. The machines and equipment applied in manufacturing processes are also latest ones as other countries. Although Myanmar manufacturers cannot introduce new products in worldwide market, they can produce similar quality products as new products used in other developed countries. So, it can help to reduce transportation and import charges for the country.

### 3.4 Profile of Respondents

146 respondents were surveyed in this study. The demographic factors of respondents: position at work, gender, age, education and way used to start this business are shown in table (3.2) and the demographic factors of organizations: region, no of employees, year of establishment, type of ownership and nature of business are described in table (3.3).

**Table (3.2) Profile of Manufacturers**

<b>Position at Work</b>	<b>Frequency</b>	<b>Percent</b>
Director	72	49.3

Executive Director	1	.7
Founder	4	2.7
Manager	1	.7
Managing Director	16	11.0
Owner	51	34.9
Quality Management Manager	1	.7
Total	146	100.0
<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Female	36	24.7
Male	110	75.3
Total	146	100.0
<b>Age Group</b>	<b>Frequency</b>	<b>Percent</b>
Under 30	8	5.5
31-40	53	36.3
41-50	52	35.6
51-60	29	19.9
61 and above	4	2.7
Total	146	100.0
<b>Education</b>	<b>Frequency</b>	<b>Percent</b>
Doctorate	4	2.7
Graduated	111	76.0
Master	31	21.2
Total	146	100.0
<b>Way used to start this business</b>	<b>Frequency</b>	<b>Percent</b>
Inherited	13	8.9
Start from scratch	133	91.1
Total	146	100.0

Source: Survey Data (2022)

Since the questionnaires were aimed to survey to top management/ owner or director level of respondents, most of respondents are directors. Most of them are male, most are between 30 and 40 of age, the education level of most are graduated and most of them started the business from scratch.

**Table (3.3) Profile of Organizations**

<b>Region</b>	<b>Frequency</b>	<b>Percent</b>
Ayarwaddy	1	.7
Bago	2	1.4

Mandalay	14	9.6
Nay Pyi Taw	1	.7
Shan	2	1.4
Yangon	126	86.3
Total	146	100.0
<b>Employees</b>	<b>Frequency</b>	<b>Percent</b>
Under 100	79	54.1
101-200	52	35.6
201-300	11	7.5
301-400	2	1.4
400 above	2	1.4
Total	146	100.0
<b>Year of Establishment</b>	<b>Frequency</b>	<b>Percent</b>
1985	1	.7
1993	1	.7
1997	3	2.1
1998	6	4.1
1999	11	7.5
2000	16	11.0
2001	7	4.8
2002	4	2.7
2003	15	10.3
2004	8	5.5
2005	12	8.2
2006	5	3.4
2007	3	2.1
2008	8	5.5
2009	14	9.6
2010	11	7.5
2011	8	5.5
2012	3	2.1
2013	1	.7
2014	1	.7
2015	4	2.7
2017	1	.7
2018	1	.7
2019	2	1.4
Total	146	100.0
<b>Ownership</b>	<b>Frequency</b>	<b>Percent</b>
Company	65	44.5
Foreign Company	4	2.7
Sole Proprietorship	77	52.7
Total	146	100.0
<b>Nature of Business</b>	<b>Frequency</b>	<b>Percent</b>
manufacturer exporter	35	24.0

manufacturer retailer	78	53.4
supplier manufacturer	33	22.6
Total	146	100.0

Source: Survey Data (2022)

Most of the respondent plastics firms are located in Yangon and most of them have employees of under 100. Most of the organizations are established in 2000. In ownership, sole proprietorship plastics firms are the most and also manufacturer retailers are the highest in nature of business.

### 3.5 Personal Factors and Organizational Factors

In this study, personal factors and organizational factors which influence creativity and innovation are explored. 9 personal factors and 6 organizational factors are focused.

**Table (3.4) Mean of Personal Factors**

<b>Personal Factors</b>	<b>Mean</b>
Creative self-efficacy	4.42
Problem identification	4.27
Information searching and encoding	4.34
Idea generation	4.28
Problem solving	4.30
Intrinsic motivation	4.07
Leadership	4.30
Risk-taking	3.37
Future orientation	4.31
Overall mean	4.18

Source: Survey data (2022)

With reference to the Table (3.4), the mean scores of the results of 8 personal factors are above 4 and an average score of overall mean is 4.18. It indicates that Myanmar plastics manufacturers have personal factors which can foster creativity and innovation. The result

indicates that mostly Myanmar plastics manufacturers have the personal behavior of “creative self-efficacy” with the highest mean of 4.42. However, manufacturers are weak in risk-taking since some of them are also scare to take risks.

**Table (3.5) Mean of Organizational Factors**

<b>Organizational Factors</b>	<b>Mean</b>
Structure	4.34
Communication	4.49
Atmosphere	4.41
Organizational creativity	4.21
Organizational support	4.27
Exploitative innovation culture	4.34
Overall mean	4.34

Source: Survey data (2022)

According to the Table (3.5), the mean scores of the results of all of the organizational factors are above 4 and overall mean is 4.34. It points that Myanmar plastics manufacturing firms have organizational factors which stimulate creativity and innovation. The result indicates that Myanmar plastics manufacturing firms mostly have the organizational factor of “communication” with the highest mean of 4.49.

### **3.6 Creativity, Innovation and Performance**

In this part, creativity and innovation are analyzed in order to investigate their impact on performance.

**Table (3.6) Creativity Mean**

<b>Creativity</b>	<b>Mean</b>	<b>Standard Deviation</b>
Keeping ears and eyes open	4.45	0.526
Taking new tasks and dealing with new people	4.61	0.517

Coming up with innovative solutions to difficult problems	4.56	0.525
Mobilizing the necessary resources for a task even when resources are scarce.	4.16	0.485
Inspiring others and infusing them with enthusiasm for a difficult task	4.34	0.544
Overall mean	4.43	

Source: Survey data (2022)

According to table (3.6), the mean scores of the results of all creativity were above 4. It indicates that Myanmar plastics manufacturers have creativity and most of them like to take new assignments and to communicate with new people because they realize that it can bring many opportunities and can gain new suppliers and customers.

**Table (3.7) Innovation Mean**

<b>Product Innovation</b>	<b>Mean</b>	<b>Standard Deviation</b>
Improving quality	4.54	0.514
Decreasing manufacturing cost	4.53	0.590
Adding new feature to current	4.33	0.600
Developing new products based on technical specifications	3.89	0.540
Developing new products based on materials	4.04	0.482
Overall product innovation mean	4.27	
<b>Process Innovation</b>	<b>Mean</b>	
Determining non value adding activities in production	4.25	0.545
Decreasing variable cost	4.49	0.646
Increasing output quality	4.55	0.588
Determining non value adding activities in delivering	4.22	0.532
Increasing delivery speed	4.47	0.553
Overall process innovation mean	4.40	
<b>Overall Innovation Mean</b>	<b>4.33</b>	

Source: Survey data (2022)

According to table (3.7), the mean scores of the results of almost all product innovation were above 4. It indicates that Myanmar plastics manufacturers are performing product innovation. Also, mean scores of all process innovation were above 4. So, Myanmar plastics manufacturers are performing both product and process innovation and process innovation are more common in Myanmar plastics manufacturing firms.

Especially, process innovation of increasing output quality in manufacturing processes, techniques, machinery and software is highest mean because Myanmar plastics manufacturers are trying to increase output quality in order to be updated with current customers' needs and competitors' tasks. For example, now they are using less environmental impact raw plastics glue. However, developing new products using different technical specifications and functionalities from the current ones is weakest innovation among all with mean value of 3.89 since applying new fixed asset or technology needs strong financial source and technicians who can run new technology.

**Table (3.8) Performance Mean**

<b>Performance</b>	<b>Mean</b>	<b>Standard Deviation</b>
Improved sale volume	4.40	0.582
Increased in profit	4.19	0.567
Improved no of new plastics products produced	3.49	0.613
Improved production volume	4.29	0.587
Increased in revenue	4.10	0.750
Overall Mean	4.09	

Source: Survey data (2022)

According to table (3.8), the mean scores of the results of almost all performance were above 4. It describes that the performance of Myanmar plastics manufacturing firms are doing well.



### **3.7 Research Designs**

The objectives of the study are to examine the effect of personal factors and organizational factors on creativity and innovation, the relationship between creativity and innovation and the influence of creativity and innovation on performance in Myanmar plastics manufacturing firms. A quantitative method is applied to get these objectives of the study.

#### **A. Data Collection**

Both primary and secondary data are applied in this study. For the collection of primary data, subjects were the 146 Myanmar plastics manufacturers who are also the members of Myanmar Plastics Industry Association. 146 manufacturers out of 233 manufacturers are selected as sample based on Rao Soft Formula.

146 structured questionnaires were spread out through Myanmar Plastics Industry Association and all of 146 questionnaires return back completely. That turnouts 100% of the respondents' size. Simple random sampling method was applied in order to distribute these set of questionnaires. Secondary data are collected from Myanmar Plastics Industry Association's website page, published journal and papers and previous studies of creativity, innovation and performance.

#### **B. Data Preparation and Analysis**

Questionnaires were adapted from Kyi (2010), Zin (2018), Chong and Ma (2010) and Kirmani (2021) in order to investigate creativity, innovation and firm performance in Myanmar plastics manufacturing firms. The questionnaires were split up into two main sections. The section one included two parts: manufacturers' profile and organizations' profile. Manufacturers' profile was regarded the respondents demographic backgrounds of name, position at work, age, gender, education and way used to start this business. Organizations' profile included name of the firm, numbers of employees, years of

establishment, type of ownership, nature of business and achievement of ISO and GMP certificate.

The section two included four parts: (1) creativity and innovation, (2) personal factors, (3) organizational factors and (4) firm performance. The first part included creativity and innovation and innovation was also subdivided into product innovation and process innovation. The first part aids to determine the relationship between creativity and innovation. The second part included personal factors and the third part included organizational factors. The second and third parts support to analyze the effect of personal and organizational factors on creativity and innovation. The last part indicated firms' performance in order to investigate the influence of creativity and innovation on performance. The five point Likert scale was used to indicate the respondents' answers (1: Totally disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Totally agree). The Likert scale data was saved as ordinal and descriptive data was saved as nominal type in SPSS.

The "creative self-efficacy" is measured with 3 statements which have been identified by Chong and Ma (2010). The "problem identification" is observed with 3 statements which are researched by Amabile (1988). The "information searching and encoding" is evaluated by 3 statements which have been identified by Chong and Ma (2010). The "idea generation" is explored with 3 statements which are observed by Amabile (1988). The "problem solving" includes the measurement of 3 statements which have been applied by Amabile (1988). The "intrinsic motivation" is observed with 3 statements which have been researched by Amabile (1988). The "leadership" is measured by a scale including 3 statements used in leadership style survey of Clark (1998). The "risk-taking" composed with 3 statements which are derived from entrepreneurial self-assessment scale of Technonet Asia (1981). The "future orientation" in this paper is measured by a scale composing of 3 items created by Bateman and Crant (1993). The "structure" is measured with 3 statements which have been identified by Chong and Ma (2010). The "communication" is observed with 3 statements which are derived from Chong and Ma (2010) and Kyi (2010). The "atmosphere" has been measured with 3 statements which have been already applied by Chong and Ma (2010) and Barrett (2016). The "organizational creativity" is observed with 3 statements which have been researched by Amabile (1988). The "organizational support" is explored with 3 statements which are researched by Chong and Ma (2010). Moreover, the "exploitative innovation culture" us measured by 3

statements applied by Kirmani (2021). The reliability analysis of questionnaire is described in next section.

### C. Reliability Analysis

Reliability means the extent to which data collection techniques and analysis procedures will expose similar findings to previous researchers. Measurements of reliability provide consistency of the measurement of variables. In this study, Cronbach's alpha test is used to determine reliability.

**Table (3.9) Reliability of Personal Factors**

<b>Factor</b>	<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>No of Items</b>
Personal	Creative Self-Efficacy	.862	3
	Problem Identification	.744	3
	Information Searching and Encoding	.816	3
	Idea Generation	.774	3
	Problem Solving	.840	3
	Intrinsic Motivation	.805	3
	Leadership	.780	3
	Risk-Taking	.844	3
	Future Orientation	.855	3

Source: Survey Data (2022)

Since the Cronbach's alpha value of each personal factor is greater than 0.7 in this research, measurement of personal factors in this study has reliability and validity.

**Table (3.10) Reliability of Organizational Factors**

<b>Factor</b>	<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>No of Items</b>
Organizational	Structure	.829	3
	Communication	.968	3
	Atmosphere	.807	3
	Organizational Creativity	.967	3
	Organizational Support	.949	3
	Exploitative Innovation Culture	.848	3

Source: Survey Data (2022)

Since the Cronbach's alpha value of each organizational factor is greater than 0.7 in this research, measurement of organizational factors in this study has reliability and validity.

**Table (3.11) Reliability of Creativity, Innovation and Performance**

<b>Factor</b>	<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>No of Items</b>
Creativity	Creativity	.834	5
Performance	Performance	.914	5
Innovation	Product Innovation	.752	5
	Process Innovation	.844	5

Source: Survey Data (2022)

Since the Cronbach's alpha values of creativity, innovation (product and process) and performance are greater than 0.7 in this research, measurement used in creativity, product innovation, process innovation and performance in this study are reliable and valid.

## **CHAPTER 4**

### **CREATIVITY AND INNOVATION OF MYANMAR PLASTICS**

#### **MANUFACTURERERS**

In this chapter, three analyses of empirical data collected from Myanmar plastic manufacturers: (1) the effect of personal factors and organizational factors on creativity, (2) the effect of creativity on innovation, and (3) the effect of innovation on firm performance are described.

#### **4.1 Analysis on Effect of Personal Factors on Creativity**

In this study, according to Heunks (1998), Amabile (1988) and Chinelato et al. (2015), nine personal factors of creative self-efficacy, problem identification, information searching and encoding, idea generation, problem solving, intrinsic motivation, leadership, risk taking and future orientation have been researched. However, the dominant personal factors of creativity can be different based on nature of industry and or business environment.

**Table (4.1) Effect of Personal Factors on Creativity**

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.523	.265		5.756	.000		
Creative Self Efficacy	.258***	.088	.311	2.937	.004	.292	3.424
Problem Identification	-.069	.107	-.081	-.650	.517	.209	4.796
Information searching and Encoding	-.035	.116	-.041	-.297	.767	.170	5.879
Idea Generation	.048	.110	.057	.437	.663	.194	5.142
Problem Solving	.178**	.084	.220	2.115	.036	.301	3.317
Intrinsic Motivation	-.101	.076	-.104	-1.340	.183	.539	1.856
Leadership	.182**	.083	.210	2.198	.030	.358	2.795
Risk-Taking	.157***	.058	.197	2.691	.008	.613	1.632
Future Orientation	.078	.077	.094	1.014	.312	.383	2.611
R	0.745						
R square	0.555						
Adjusted R Square	0.525						
F-value	18.819***						
Durbin-Watson	2.271						

Source: Survey data (2022)

Notes: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level

As shown in Table (4.1),  $R^2$  is 0.555 and adjusted  $R^2$  is 0.525. This model explains well that the variation of the creativity is predicted by the measures of personal factors since the value of  $R^2$  is 0.555. The value of adjusted  $R^2$  is 0.525 and this indicates that there is a 52.5% variance between the independent variable (personal factors) and dependent variable (creativity). There is no autocorrelation in sample because the Durbin-Watson is 2.271 within the acceptable range (1.5 to 2.5). All VIF (variance inflation factor) of predictor variables are less than 10. Therefore, there is no problem of multicollinearity (correlation

between predictor variables). The F test value, the overall significance of the models, turned out highly significant at 1% level.

In Myanmar plastics manufacturing firms, the creativity of manufacturer is influenced by the personal factors of creative self-efficacy, problem solving, leadership and risk taking. Among personal factors, creative self-efficacy and risk-taking have positive sign and significant value at 1 percent. They have the greatest contribution to the effect on creativity. Whenever 1 unit increases in creative self-efficacy, 0.258 unit increases in creativity. Also, whenever 1 unit increases in risk-taking, 0.157 unit increases in creativity. Personal factors of leadership and problem solving have positive sign and significant value at 5 percent. The increase in variables such as leadership and problem solving by 1 unit will also raise the effect on creativity by 0.182 and 0.178 units respectively.

Therefore, increase in personal factors of creative self-efficacy, problem solving, leadership and risk taking can foster creativity in Myanmar plastics manufacturing firms. Myanmar plastics manufacturers with these personal factors can generate novel ideas, have confidence to solve problems creatively and or to develop further ideas, demonstrate problems, seek different perspectives when solving problems, empower employees, enjoy risk taking and always seeking new ways to look at things.

#### **4.2 Analysis on Effect of Organizational Factors on Creativity**

According to Woodman et al. (1993), Amagoh (2008), Schneider and Somers (2006) and Amabile (1988), six organizational factors of (1) structure, (2) communication, (3) atmosphere, (4) organizational creativity, (5) organizational support and (6) exploitative innovation culture are researched in this study. However, the dominant organizational factors of creativity will be varied with nature of business and or industry environment.

**Table (4.2) Effect of Organizational Factors on Creativity**

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.348	.280		4.815	.000		
Structure	.375***	.080	.442	4.682	.000	.360	2.778
Communication	.057	.068	.082	.835	.405	.334	2.991
Atmosphere	.228***	.082	.249	2.768	.006	.395	2.529
Organizational Creativity	-.008	.063	-.009	-.124	.901	.640	1.562
Organizational Support	-.019	.063	-.023	-.305	.761	.564	1.773
Exploitative Innovation Culture	.070	.068	.081	1.028	.306	.518	1.929
R	0.744						
R square	0.554						
Adjusted R Square	0.535						
F-value	28.756***						
Durbin-Watson	2.149						

Source: Survey data (2022)

Notes: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level

As shown in Table (4.2),  $R^2$  is 0.554 and adjusted  $R^2$  is 0.535. This model explains well that the variation of the creativity is predicted by the measures of organizational factors since the value of  $R^2$  is 0.554. The value of adjusted  $R^2$  is 0.535 and this indicates that there is a 53.5% variance between the independent variable (organizational factors) and dependent variable (creativity). There is no autocorrelation in sample because the Durbin-Watson is 2.149 within the acceptable range (1.5 to 2.5). All VIF (variance inflation factor) of predictor variables are less than 5. Therefore, there is no problem of multicollinearity (correlation between predictor variables). The F test value, the overall significance of the models, turned out highly significant at 1% level.

In Myanmar plastics manufacturing firms, the creativity of manufacturer is positively influenced by the organizational factors of structure and atmosphere with the



significant value at 1 percent. The increase in variables, structure and atmosphere by 1 unit, will also raise the effect on creativity by 0.375 and 0.228 units respectively.

Structure of the organizations of Myanmar plastics manufacturing firms include defined rules and procedures, power and formal hierarchy. Rules and procedures are needed to be followed but they are designed to encourage creativity and innovation. Although there is formal hierarchy, employees are empowered to accomplish the job and to create innovative ideas. Also, atmosphere includes fun and playfulness, free and open communication, and caring about building up employees. Organizations support free communication so employees can share ideas for new creations and suggestions for problems to each other. Organizations are family type styles and so employees can feel fun and playfulness. Moreover, organizations support learning aid and enhance employees' motivation by not only psychologically but also financially in order to building up employees. Therefore, organizational factors of structure and atmosphere are playing vital roles in increasing creativity of Myanmar plastics manufacturing firms.

### **4.3 Analysis on Effect of Personal Factors and Organizational Factors on Creativity**

Mean value of personal factors and organizational factors are used to analyze the influence of both personal and organizational factors on creativity.

**Table (4.3) Effect of Personal and Organizational Factors on Creativity**

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.170	.259		4.514	.000		
Personal Factors	.407***	.117	.412	3.484	.001	.233	4.296
Organizational Factors	.355***	.123	.342	2.892	.004	.233	4.296
R	0.731						
R square	0.534						
Adjusted Square R	0.528						
F-value	81.943***						
Durbin-Watson	2.114						

Source: Survey data (2022)

Notes: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level

As shown in Table (4.3),  $R^2$  is 0.534 and adjusted  $R^2$  is 0.528. This model explains well that the variation of the creativity is predicted by the measures of personal and organizational factors since the value of  $R^2$  is 0.534. The value of adjusted  $R^2$  is 0.528 and this indicates that there is a 52.8% variance between the independent variable (personal and organizational factors) and dependent variable (creativity). There is no autocorrelation in sample because the Durbin-Watson is 2.114 within the acceptable range (1.5 to 2.5). All VIF (variance inflation factor) of predictor variables are less than 5. Therefore, there is no problem of multicollinearity (correlation between predictor variables). The F test value, the overall significance of the models, turned out highly significant at 1% level.

Both personal and organizational factors have positive sign and significant value at 1 percent. When 1 unit increases in personal factors, 0.407 unit increases in creativity. Also, 1 unit increases in organizational factors, 0.355 unit increases in creativity. This is because, personal factors of manufacturers can enhance creativity by mean of keeping ears and eyes open, taking new tasks and dealing with new people, and inspiring others. For example, Myanmar plastics manufacturers always seeking new and developed ways of manufacturing plastics products in other countries and inspire them, and dealing and

cooperating with new suppliers. Also, organizational factors of manufacturing firms can create new innovative solutions to difficult problems and mobilizing the necessary resources even they are scarce.

#### **4.4 Analysis on Effect of Creativity on Innovation**

Many researchers have been claimed that there is a positive relationship between creativity and innovation. In this paper, 146 numbers of Myanmar plastics manufacturers are surveyed. As shown in Table (4.7),  $R^2$  is 0.584 and adjusted  $R^2$  is 0.581. This model explains well that the variation of the innovation is predicted by the measures of creativity since the value of  $R^2$  is 0.584. The value of adjusted  $R^2$  is 0.581 and this indicates that there is a 58.1% variance between the independent variable (creativity) and dependent variable (innovation). There is no autocorrelation in sample because the Durbin-Watson is 1.997 within the acceptable range (1.5 to 2.5). All VIF (variance inflation factor) of predictor variables are less than 5. Therefore, there is no problem of multicollinearity (correlation between predictor variables). The F test value, the overall significance of the models, turned out highly significant at 1% level.

**Table (4.4) Effect of Creativity on Innovation**

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.010	.235		4.302	.000		
Creativity	.750***	.053	.764	14.204	.000	1.000	1.000
R	0.764						
R square	0.584						
Adjusted Square	R	0.581					
F-value	201.753***						
Durbin-Watson	1.997						

Source: Survey Data (20220)

Notes: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level

Creativity has positive sign and significant value at 1 percent. Whenever 1 unit increase in creativity, 0.750 unit increases in innovation. For example, creativity of taking new tasks and dealing with new people can support to add new feature in existing products according to customers' needs, competitors' movements and or updated condition. Also, creativity of keeping ears and eyes open can decrease manufacturing costs and variable costs by eliminating non value-added activities by learning from others.

#### 4.5 Analysis on Effect of Innovation on Performance

To analyze the correlations of innovation and performance, the five measures of performance are used in this study: sale volume, profit, number of items, production volume and revenue according to Garrigós-Simón and Palacios Marqués (2004), Mark (2015) and Kristinae et al. (2020). Time frame identification is last three years since Mahemba and Bruijn (2003) stated that time horizon should be at least 3 years to measure performance of SMEs in developing countries. For innovation, product and process innovation are analyzed with five items in each which are developed and modified from (Kyi, 2010). All the questions are designed in five Likert scale.

**Table (4.5) Effect of Innovation on Performance**

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.190	.368		.516	.606		
Innovation	.902***	.085	.663	10.640	.000	1.000	1.000
R	.663						
R square	.440						
Adjusted Square	R	.436					
F-value	113.215***						
Durbin-Watson	1.565						

Source: Survey data (2022)

Notes: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level

As shown in Table (4.8),  $R^2$  is 0.440 and adjusted  $R^2$  is 0.436. This model explains well that the variation of the performance is predicted by the measures of creativity and innovation since the value of  $R^2$  is 0.440. The value of adjusted  $R^2$  is 0.436 and this indicates that there is a 43.6% variance between the independent variable (creativity and innovation) and dependent variable (performance). There is no autocorrelation in sample because the Durbin-Watson is 1.565 within the acceptable range (1.5 to 2.5). All VIF (variance inflation factor) of predictor variables are less than 5. Therefore, there is no problem of multicollinearity (correlation between predictor variables). The F test value, the overall significance of the models, turned out highly significant at 1% level.

Innovation has positive sign and significant value at 1 percent. Whenever 1 unit increase in innovation, 0.952 unit increases in performance. The innovation stems from the creativity so creativity is necessary for innovation in Myanmar plastics manufacturing firms. The performance of manufacturing firm is resulted directly from innovation where the baseline is creativity. In Myanmar plastics manufacturing firms, innovation can enhance performance because increasing quality, adding new features, developing new products and increasing delivery speed foster sale volume and profit. Moreover, innovation of decreasing

manufacturing cost and variable cost, and decreasing non value added activities help to increase profit in Myanmar plastics manufacturing firms.

## CHAPTER 5

### CONCLUSION

This chapter describes the findings from the study of 146 Myanmar plastics manufacturers who have both GMP license, ISO and MIC permit. This chapter consists of analysis of the results and their discussion, suggestions and recommendations of findings from influence analysis of personal factors and organizational factors on creativity; relationship analysis of creativity, innovation and performance in Myanmar plastics manufacturing firms; scope limitations of this research and the need for further investigation on this study.

#### 5.1 Finding and Discussion

This study explores the ways in which personal and organizational factors influence creativity of Myanmar plastics manufacturers, creativity is associated with innovation and innovation influence on performance. It also provides unique theoretical contributions expanding on previous knowledge and literature of creativity, innovation and performance.

The results of this study reveal a clear understanding of influence of personal and organizational factors on creativity, the positive relationship between creativity and innovation, and positive impact of innovation on performance.

According to demographics data, most of the manufacturers are between 30 to 50 years old and most of them are graduated. They developed the plastics firms mostly from scratch and most of the firms are located in Yangon. Mostly, Myanmar plastics manufacturing firms are small-medium enterprises with under 100 employees. The ownership is especially sole proprietorship and most of manufacturers are “manufacturer retailers”. According to this data, all of Myanmar plastics manufacturers are educated people and most of the plastics firms are SMEs. Although manufacturer importers and manufacturer exporters are existed in these years, most of the manufacturers produce plastics products for domestic use.

The study’s first contribution is concerned with the effect of personal factors and organizational factors on creativity of Myanmar plastics manufacturers. While I am

accessing that it indicates both personal and organizational factors have strong influence on creativity, and personal factors have more influence than organizational factors.

According to the survey results, Myanmar Plastics manufacturers are strongest in personal behavior of creative self-efficacy and weakest in personal factor of risk-taking. This is because some of manufacturers are scare to take risks since expected return and cost are difficult to predict. Personal factors such as creative self-efficacy, problem solving, leadership and risk-taking have effect on creativity of Myanmar plastics manufacturers. Especially, creative self-efficacy and risk-taking have strongest effect on manufacturer's creativity.

According to the survey results, Myanmar Plastics manufacturing firms are strongest in organizational behavior of communication and weakest in organizational creativity. This is because overall performance of producing new and operable ideas and identifying new opportunities are not strong enough in some of Myanmar plastics manufacturing firms. Creativity of Myanmar plastics manufacturers are strongly effected by organizational factors of structure and atmosphere.

As many previous researches and findings, creativity has strong effect on innovation. It indicates that creativity is the foundation of innovation in Myanmar plastics manufacturing industries.

In the final part of analysis, the effect of innovation on performance of Myanmar plastics manufacturers is investigated. The performance is measured with the five criteria such as sale volume, profit, number of plastics items produced, production volume and revenue. The findings point out that innovation has strong and direct impact on performance of Myanmar plastics manufacturing firms. Creativity is the baseline and support of innovation and innovation can foster performance.

## **5.2 Suggestions and Recommendations**

According to the finding, personal factor of creative self-efficacy and risk-taking have the strongest effect on creativity. Most of the Myanmar plastics manufacturers have the personal factor of creative self-efficacy. So, in order to increase creativity, plastics



manufacturers should maintain this personal factor, creative self-efficacy. Although personal factor of risk-taking has strong influence on creativity, most of the Myanmar plastics manufacturers are weak in risk-taking. So, manufacturers should raise risk-taking factor to foster creativity. Moreover, personal factors of problem solving and leadership have positive effect on creativity so manufacturers should maintain and encourage these factors in order to increase creativity.

Organizational factors of structure and atmosphere have highest impact on creativity. Most of Myanmar plastics manufacturing firms have these organizational factors so plastics firms should follow and conserve these factors. Myanmar plastics manufacturers have to pay attention on rules and procedures, organizational structure and hierarchy. Workplace must be a good surrounding which supports fun, free and open communication and caring about building up employees.

As finding, creativity and strong effect on innovation. Myanmar plastics manufacturers should raise creativity in order to increase innovation since innovation has strong impact on performance of Myanmar plastics manufacturing firms. So, to achieve better performance and to develop more, Myanmar plastics manufacturers should focus on innovation. Both product and process innovation play vital roles for performance. According to the data result, Myanmar plastics industries are weak in product innovation of “developing new products using different technical specifications and functionalities from the current ones” so firms should encourage themselves to learn and use different technical specifications and functionalities which are used in other developing countries in order to strengthen innovation.

### **5.3 Needs for Further Research**

This thesis is the first stage paper for studying the creativity, innovation, and performance of Myanmar plastics manufacturers by investigating the 146 Myanmar plastics manufacturers. In this study, according to the focus of the objectives of this thesis, the innovation capabilities of each types of plastics manufacturers have not investigated in detail. If the time is longer to do research, the research on the innovativeness of Myanmar

plastics manufacturers with each type of manufacturer-suppliers, manufacturer-retailers and manufacturer-exporters should be done in the future.

This research is only emphasized on Myanmar plastics manufacturing firms and does not cover all types of manufacturing firms in Myanmar. Therefore, the creativity, innovation and performance in other manufacturing sectors such as software developing, architecture, food and beverage, commodity and so on should also be examined in the future.

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# APPENDICES

## Appendix A: Survey Questionnaire

### Innovation and Performance in Myanmar Plastics Manufacturing Firms

**Objective:** This questionnaire is intended to apply for interview with Founder/ Owner-Manager/ Managing Director or someone who is playing at the role of firm's manufacturer. It will be used only for a survey that will be conducted in a research required to submit for the attainment of Master's Degree conferred by Yangon Institute of Economics. Research topic is "Innovation and Performance in Myanmar Plastics Manufacturing Firms".

Date: .....

Respondent's Name: .....

Name of the firm: .....

To make contact:

Firm's Address: .....

Phone Number: .....

E-mail: .....

#### Section One

##### Part A: Manufacturer's Profile

I.

- i. Name: .....
- ii. Position at Work: .....
- iii. Age: (     ) Year
- iv. Gender: Male  Female

II. Please describe your education qualifications.

Middle school complete

High school complete



Graduated   
 Master Graduated   
 PhD/ Doctorate Graduated   
 Others  please specify .....

III. Which way did you use to get started current business?

Start from scratch   
 Inherited   
 Partnership   
 Purchasing existing firm   
 Others  Please specify.....

IV. Are you a member of Myanmar Plastics Industries Association?

Yes  No

**Part B: Organization's Profile**

I. Name of the Firm: .....

II. Number of Employees: .....

III. Year of Establishment: .....

IV. Type of Ownership: Sole Proprietorship   
 Company  Foreign Company  Partnership   
 Others  please specify.....

V. Describe the plastics items currently in the market that you have been produced?  
 .....

VI. Nature of your business  
 Retail and distribute   
 Import/Export  others  please specify.....

VII. Do you have ISO for quality of your plastics products?

Yes  No

VIII. Have you got GMP certificate from the Directorate of Industrial Supervision and Inspection (DISI)?

Yes  No

## Section Two

### Part A: Creativity and Innovation

#### I. Creativity

(Check the responses that you feel apply to you.)

Scales (1: Totally disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Totally agree)

No.	Statement	1	2	3	4	5
1	I am usually keeping ears and eyes open to what is happening around me.					
2	I like to take on new tasks and to deal with new people.					
3	I like to come up with innovative solutions to difficult problems at work.					
4	I have a knack for mobilizing the necessary resources for a task even when resources are scarce.					
5	I am able to inspire others and I am able to infuse them with my enthusiasm for a difficult task.					

#### II. Innovation

To what extent were the following kinds of innovations types implemented in your organization in the last three years (2019-2021) related to the following kinds of activities.

##### Product Innovation

No.	Statement	1	2	3	4	5
1	Improving quality in components and materials of current products.					
2	Decreasing manufacturing cost in components and materials of current products.					
3	Adding new feature to current products leading to improved ease of use for customers and to improved customer satisfaction.					
4	Developing new products using different technical specifications and functionalities from the current ones.					
5	Developing new products with different components and materials used in current ones.					

## Process Innovation

No.	Statement	1	2	3	4	5
1	Determining and eliminating non value adding activities in production processes.					
2	Decreasing variable cost components in manufacturing processes, techniques, machinery and software.					
3	Increasing output quality in manufacturing processes, techniques, machinery and software.					
4	Determining and eliminating non value adding activities in delivery related processes.					
5	Increasing delivery speed in delivery related logistics processes.					

## Part B: Personal Factors

(Check the responses that you feel apply to you.)

Scales (1: Totally disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Totally agree)

### Creative Self-efficacy

No.	Statement	1	2	3	4	5
1	I feel that I am good at generating novel ideas.					
2	I have confidence in my ability to solve problems creatively.					
3	I have a knack for further developing the ideas of others.					

### Problem Identification

No.	Statement	1	2	3	4	5
1	I spend considerable time trying to understand the nature of the problem.					
2	I think about the problem from multiple perspectives.					
3	I break down a difficult problem/assignment into parts to obtain greater understanding.					

### Information Searching and Encoding

No.	Statement	1	2	3	4	5
1	I search for information from multiple sources (e.g., personal memories, others' experiences, documentation, Internet, etc.).					
2	I consult with a wide variety of information.					
3	I retain large amounts of detailed information in my area of expertise for future use.					

### Idea Generation

No.	Statement	1	2	3	4	5
1	I consider diverse sources of information in generating new ideas.					
2	I generate a significant number of alternatives to the same problem before I choose the final solution.					
3	I spend considerable time shifting through information that helps to generate new ideas.					

### Problem Solving

No.	Statement	1	2	3	4	5
1	I don't interfere employees until problems become serious.					
2	I demonstrate that problems must become chronic before taking action.					
3	I seek differing perspectives when solving problems.					

### Intrinsic Motivation

No.	Statement	1	2	3	4	5
1	I enjoy finding solutions to complex problems.					
2	I enjoy creating new procedures for work tasks.					
3	I enjoy improving existing processes or products.					

### Leadership

No.	Statement	1	2	3	4	5
1	I always try to include one or more employees in determining what to do and how to do it but, I maintain the final decision making authority.					
2	I and my employees always vote whenever a major decision has to be made.					
3	I closely monitor my employees to ensure they are performing correctly.					

### Risk-Taking

No.	Statement	1	2	3	4	5
1	I have often described as a risk taker by people who know me.					
2	I enjoy risk-taking, which is what business is all about.					
3	I see risk-taking as an integral part of a challenging career.					

### Future Orientation

No.	Statement	1	2	3	4	5
1	I excel at identifying opportunities.					
2	I articulate a compelling vision of the future.					
3	I consider the moral and ethical consequences of decisions.					

### Part C: Organizational Factors

#### Structure

No.	Statement	1	2	3	4	5
1	It is very important to follow rules and procedures in my organization.					
2	At my place of work, power is in the hands of relatively few people.					
3	Procedures and structures are too formal in my organization.					

#### Communication

No.	Statement	1	2	3	4	5
1	People share ideas and information with other team members.					
2	People in my workplace cooperate and interact with customers for new product/ process innovation.					
3	People in my workplace cooperate and interact with suppliers for new product/ process innovation.					

#### Atmosphere

No.	Statement	1	2	3	4	5
1	My workplace is fun and playful.					
2	There is a free and open communication in my organization.					
3	There is an atmosphere of caring about building up employees.					

### Organizational Creativity

No.	Statement	1	2	3	4	5
1	Overall, this organization produce new ideas in achieving the organization's goals.					
2	Overall, this organization generates novel, but operable work-related ideas.					
3	Overall, this organization identifies opportunities for new products/processes.					

### Organizational Support

No.	Statement	1	2	3	4	5
1	I have sufficient time to do my project(s).					
2	I can get the resources I need for my work.					
3	Organization has enough capital for operation and expansion.					

### Exploitative Innovation Culture

No.	Statement	1	2	3	4	5
1	We increase production in existing markets.					
2	We improve our provisions efficiency of products and services					
3	We frequently refine the provision of existing products and services.					

### Part D: Performance

(Check the responses that you feel apply to you for your recent 3 years **2019 to 2022**)

Scales (1: Totally disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Totally agree)

No.	Statement	1	2	3	4	5
1	Improved sale volume					
2	Increased in profit					
3	Improved no of new plastics products produced					
4	Improved production volume					
5	Increased in revenue					

Thank you for your participation.



## Appendix B: Personal Factors

Sr.	Creative Self-efficacy	Mean	Standard Deviation
1.	I feel that I am good at generating novel ideas.	4.51	0.578
2.	I have confidence in my ability to solve problems creatively.	4.53	0.553
3.	I have a knack for further developing the ideas of others.	4.23	0.509
	<b>Overall Mean</b>	<b>4.42</b>	

Sr.	Problem Identification	Mean	Standard Deviation
1.	I spend considerable time trying to understand the nature of the problem.	3.93	0.618
2.	I think about the problem from multiple perspectives.	4.46	0.552
3.	I break down a difficult problem/assignment into parts to obtain greater understanding.	4.42	0.573
	<b>Overall Mean</b>	<b>4.27</b>	

Sr.	Information Searching and Encoding	Mean	Standard Deviation
1.	I search for information from multiple sources (e.g., personal memories, others' experiences, documentation, Internet, etc.).	4.49	0.528
2.	I consult with a wide variety of information.	4.46	0.565
3.	I retain large amounts of detailed information in my area of expertise for future use.	4.06	0.590
	<b>Overall Mean</b>	<b>4.34</b>	

<b>Sr.</b>	<b>Idea Generation</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I consider diverse sources of information in generating new ideas.	4.47	0.601
2.	I generate a significant number of alternatives to the same problem before I choose the final solution.	4.47	0.578
3.	I spend considerable time shifting through information that helps to generate new ideas.	3.91	0.537
	<b>Overall Mean</b>	<b>4.28</b>	

<b>Sr.</b>	<b>Problem Solving</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I don't interfere employees until problems become serious.	3.95	0.596
2.	I demonstrate that problems must become chronic before taking action.	4.48	0.554
3.	I seek differing perspectives when solving problems.	4.47	0.566
	<b>Overall Mean</b>	<b>4.30</b>	

<b>Sr.</b>	<b>Intrinsic Motivation</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I enjoy finding solutions to complex problems.	4.13	0.488
2.	I enjoy creating new procedures for work tasks.	3.99	0.477
3.	I enjoy improving existing processes or products.	4.10	0.503
	<b>Overall Mean</b>	<b>4.07</b>	

<b>Sr.</b>	<b>Leadership</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I always try to include one or more employees in determining what to do and how to do it but, I maintain the final decision making authority.	3.92	0.545
2.	I and my employees always vote whenever a major decision has to be made.	4.49	0.566
3.	I closely monitor my employees to ensure they are performing correctly.	4.49	0.566
	<b>Overall Mean</b>	<b>4.30</b>	

<b>Sr.</b>	<b>Risk-Taking</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I have often described as a risk taker by people who know me.	3.53	0.645
2.	I enjoy risk-taking, which is what business is all about.	3.21	0.515
3.	I see risk-taking as an integral part of a challenging career.	3.37	0.563
	<b>Overall Mean</b>	<b>3.37</b>	

<b>Sr.</b>	<b>Future Orientation</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I excel at identifying opportunities.	4.21	0.562
2.	I articulate a compelling vision of the future.	4.24	0.555
3.	I consider the moral and ethical consequences of decisions.	4.47	0.541
	<b>Overall Mean</b>	<b>4.31</b>	

### Appendix C: Organizational Factors

Sr.	Structure	Mean	Standard Deviation
1.	It is very important to follow rules and procedures in my organization.	4.49	0.554
2.	At my place of work, power is in the hands of relatively few people.	4.05	0.530
3.	Procedures and structures are too formal in my organization.	4.47	0.566
	<b>Overall Mean</b>	<b>4.34</b>	

Sr.	Communication	Mean	Standard Deviation
1.	People share ideas and information with other team members.	4.49	0.578
2.	People in my workplace cooperate and interact with customers for new product/ process innovation.	4.49	0.602
3.	People in my workplace cooperate and interact with suppliers for new product/ process innovation.	4.49	0.613
	<b>Overall Mean</b>	<b>4.49</b>	

<b>Sr.</b>	<b>Atmosphere</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	My workplace is fun and playful.	4.56	0.538
2.	There is a free and open communication in my organization.	4.53	0.578
3.	There is an atmosphere of caring about building up employees.	4.13	0.428
	<b>Overall Mean</b>	<b>4.41</b>	

<b>Sr.</b>	<b>Organizational Creativity</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	Overall, this organization produces new ideas in achieving the organization's goals.	4.18	0.484
2.	Overall, this organization generates novel, but operable work-related ideas.	4.23	0.451
3.	Overall, this organization identifies opportunities for new products/processes.	4.21	0.458
	<b>Overall Mean</b>	<b>4.21</b>	

<b>Sr.</b>	<b>Organizational Support</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	I have sufficient time to do my project(s).	4.27	0.502
2.	I can get the resources I need for my work.	4.30	0.503
3.	Organization has enough capital for operation and expansion.	4.25	0.519
	<b>Overall Mean</b>	<b>4.27</b>	

Sr.	<b>Exploitative Innovation Culture</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	We increase production in existing markets.	4.40	0.544
2.	We improve our provisions efficiency of products and services.	4.38	0.529
3.	We frequently refine the provision of existing products and services.	4.23	0.522
	<b>Overall Mean</b>	<b>4.34</b>	

## Appendix II: Statistical Output

### Multiple Linear Regression (Regression between Personal Factors Mean, Organizational Factors and Creativity)

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
						F Change	df1	df2		
1	.731 <sup>a</sup>	.534	.528	.27696	.534	81.943	2	143	.000	2.114

a. Predictors: (Constant), OFMEAN, PFMEAN

b. Dependent Variable: Creativity

#### ANOVA<sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.572	2	6.286	81.943	.000 <sup>b</sup>
	Residual	10.969	143	.077		
	Total	23.541	145			

a. Dependent Variable: Creativity

b. Predictors: (Constant), OFMEAN, PFMEAN

#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.170	.259		4.514	.000		
	PFMEAN	.407	.117	.412	3.484	.001	.233	4.296
	OFMEAN	.355	.123	.342	2.892	.004	.233	4.296

a. Dependent Variable: Creativity

## Multiple Linear Regression (Regression between Personal Factors and Creativity)

### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
						F Change	df1	df2		
1	.745 <sup>a</sup>	.555	.525	.27765	.555	18.819	9	136	.000	2.271

a. Predictors: (Constant), Future\_Orientation, Risk\_Taking, Intrinsic\_Motivation, Leadership, Problem\_Solving, Idea\_Generation, Creative\_Self\_Efficacy, Problem\_Identification, Information\_searching\_Encoding

b. Dependent Variable: Creativity

### ANOVA<sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.057	9	1.451	18.819	.000 <sup>b</sup>
	Residual	10.484	136	.077		
	Total	23.541	145			

a. Dependent Variable: Creativity

b. Predictors: (Constant), Future\_Orientation, Risk\_Taking, Intrinsic\_Motivation, Leadership, Problem\_Solving, Idea\_Generation, Creative\_Self\_Efficacy, Problem\_Identification, Information\_searching\_Encoding

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.523	.265		5.756	.000	1.000	2.046		
	Creative_Self_Efficacy	.258	.088	.311	2.934	.004	.084	.432	.292	3.424
	Problem_Identification	-.069	.107	-.081	-0.650	.517	-.280	.142	.209	4.796
	Information_searching_Encoding	-.035	.116	-.041	-.297	.767	-.265	.196	.170	5.879
	Idea_Generation	.048	.110	.057	.437	.663	-.169	.266	.194	5.142



Problem_Solving	.178	.084	.220	2.115	.036	.012	.345	.301	3.317
Intrinsic_Motivation	-.101	.076	-.104	-1.340	.183	-.251	.048	.539	1.856
Leadership	.182	.083	.210	2.198	.030	.018	.345	.358	2.795
Risk_Taking	.157	.058	.197	2.691	.008	.042	.273	.613	1.632
Future_Orientation	.078	.077	.094	1.014	.312	-.074	.229	.383	2.611

a. Dependent Variable: Creativity

### Multiple Linear Regression (Regression between Organizational Factors and Creativity)

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
						F Change	df1	df2		
1	.744 <sup>a</sup>	.554	.535	.27489	.554	28.756	6	139	.000	2.149

a. Predictors: (Constant), Exploitative\_Innovation\_Culture, Organizational\_Creativity, Organizational\_Support\_Sufficient\_Time\_Resources, Atmosphere, Structure\_Control\_Hierarchy, Interaction\_Communication\_Consultation

b. Dependent Variable: Creativity

#### ANOVA<sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.038	6	2.173	28.756	.000 <sup>b</sup>
	Residual	10.504	139	.076		
	Total	23.541	145			

a. Dependent Variable: Creativity

b. Predictors: (Constant), Exploitative\_Innovation\_Culture, Organizational\_Creativity, Organizational\_Support\_Sufficient\_Time\_Resources, Atmosphere, Structure\_Control\_Hierarchy, Interaction\_Communication\_Consultation

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
	1 (Constant)	1.348	.280		4.815	.000	.795	1.902	
Structure_Control_Hierarchy	.375	.080	.442	4.682	.000	.217	.534	.360	2.778
Interaction_Communication_Consultation	.057	.068	.082	.835	.405	-.078	.192	.334	2.991
Atmosphere	.228	.082	.249	2.768	.006	.065	.391	.395	2.529
Organizational_Creativity	-.008	.063	-.009	-.124	.901	-.133	.117	.640	1.562
Organizational_Support_Sufficient_Time_Resources	-.019	.063	-.023	-.305	.761	-.143	.105	.564	1.773
Exploitative_Innovation_Culture	.070	.068	.081	1.028	.306	-.065	.205	.518	1.929

a. Dependent Variable: Creativity

### Linear Regression (Regression between Creativity and Innovation)

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
						F Change	df1	df2		
1	.764 <sup>a</sup>	.584	.581	.25629	.584	201.753	1	144	.000	1.997

a. Predictors: (Constant), Creativity

b. Dependent Variable: INNOMEAN

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.252	1	13.252	201.753	.000 <sup>b</sup>
	Residual	9.459	144	.066		
	Total	22.711	145			

a. Dependent Variable: INNOMEAN

b. Predictors: (Constant), Creativity

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.010	.235		4.302	.000	.546	1.474		
	Creativity	.750	.053	.764	14.204	.000	.646	.855	1.000	1.000

a. Dependent Variable: INNOMEAN

**Linear Regression (Regression between Innovation and Performance)**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
						F Change	df1	df2		
1	.663 <sup>a</sup>	.440	.436	.40378	.440	113.215	1	144	.000	1.565

a. Predictors: (Constant), INNOMEAN

b. Dependent Variable: Performance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	18.458	1	18.458	113.215	.000 <sup>b</sup>
	Residual	23.477	144	.163		
	Total	41.936	145			

a. Dependent Variable: Performance

b. Predictors: (Constant), INNOMEAN

<b>Coefficients<sup>a</sup></b>									
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	.190	.368		.516	.606	-.538	.918		
INNOMEAN	.902	.085	.663	10.640	.000	.734	1.069	1.000	1.000

a. Dependent Variable: Performance