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Editorial

Information Management and Business Review (IMBR) provides a unique platform to scholars around the world to share their knowledge and publish research work in the fields of information management, business, management and related disciplines. The work submitted for publication consideration in IMBR should address empirical and theoretical developments in the subjects related to the scope of the journal in particular and allied theories and practices in general. Scope of IMBR includes: subjects of finance, accounting, auditing, cost & management accounting, financial psychology, financial literacy, marketing, information management, human resource management, knowledge management, innovation, change management, enterprise management, e-commerce and information system. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal, and that all listed authors approve its submission to IMBR. It is IMBR policy to welcome submissions for consideration, which are original, and not under consideration for publication by another journal at the same time. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. The current issue of IMBR comprises of papers of scholars from Thailand, Indonesia, Pakistan, Nigeria and Oman. Social media for smart farmer-shared farming equipment model, financial behavior of working women in investment decision-making, power, intrateam conflicts, conflict contagion and its impact on performance, assessing working capital management and performance of listed manufacturing firms and excel based financial modeling for making portfolio management decisions are some of the major practices and concepts examined in these studies. Journal received research submission related to all aspects of major themes and tracks. All the submitted papers were first assessed by the editorial team for relevance and originality of the work and blindly peer-reviewed by the external reviewers depending on the subject matter of the paper. After the rigorous peer-review process, the submitted papers were selected based on originality, significance, and clarity of the purpose. The current issue will therefore be a unique offer, where scholars will be able to appreciate the latest results in their field of expertise, and to acquire additional knowledge in other relevant fields.

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PAPERS

Information Management and Business Review (ISSN 2220-3796)
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Social Media for Smart Farmer-Shared Farming Equipment Model

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Abstract: This research offers a roadmap for creating a concept for building a collaborative and connected mobility model to share the agricultural machine. The study aims to adopt those models to create a collaborative and connected mobility model as a Shared Agricultural Machine Network for Smart Farmer. The fact that Thai farmers are facing the aging crisis, like all other industries and farming machinery has become a need for manpower replacement to keep their earning for livings. Unfortunately, these machines are often expensive, so they can own only a few, and when it comes to reaping the harvest season, and they often require different tools for specific purposes. Our survey has shown that farmers have different ways of cultivating different crops at the same time this implies that in harvesting season there are unused agricultural pieces of equipment available to share among them. The model of shared farm equipment could lead to new farmers' way of life and it's time to become smart-farmers. This paper will discuss important considerations, including the need for challenges, trends, and opportunities for farmers to have machinery when needed and to share what idle with others via a peer-to-peer network using mobile application platform.

Keywords: S*ocial media networking, agricultural equipment sharing, farming equipment sharing, collaborative mobility, peer-to-peer network*

1. Introduction

Thailand relies heavily on agricultural sector as the economic growth recorded by the country in the 1970s and the early 1980s was owed mainly to the steady expansion of the agricultural sector (Country Profile Thailand, n.d.). Thailand 4.0 is a sector-specific industrial policy that aims to attract new investment towards transforming the economy. Now and then, Thailand has been passed through three major stages of development as the era of agriculture (Thailand 1.0), a light industrial (Thailand 2.0), and today, a heavy industry (Thailand 3.0). Recently, Thai Government policy vision, Thailand 4.0,-transforming the traditional economy into an innovation-driven economy— agriculture must change from traditional agriculture to modern agriculture (it24hrs, 2017). Typically, farmers who are not aware of seizing this opportunity are just looking for the agricultural machinery and equipment, such as a compact tractor, harvester, cutters, and crane, to increase agricultural productivity. Unfortunately, farming machines are expensive and often a shortage.

When it comes to seeding or harvesting season, especially for the areas that grow similar crops investing new machinery and equipment is one possibility but not a feasible solution for small farm owner. Our survey has shown that farmers have different ways of cultivating different crops at the same time this implies that in harvesting season there are unused agricultural pieces of equipment available to share among them. This article discusses a collaborative mobility model that links farmers and owners of agricultural tools and demonstrates the use of the model by developing a mobile application that is designed to meet the needs of the agricultural tool sharing. The important considerations, including the need for challenges, trends, and opportunities for farmers to have machinery when needed and to share what idle with others via a peer-to-peer network using a mobile application platform. A model of shared farm equipment in this research demonstrates that the use of mobile technology has been recognized and can be extended to the potential uses in the future.

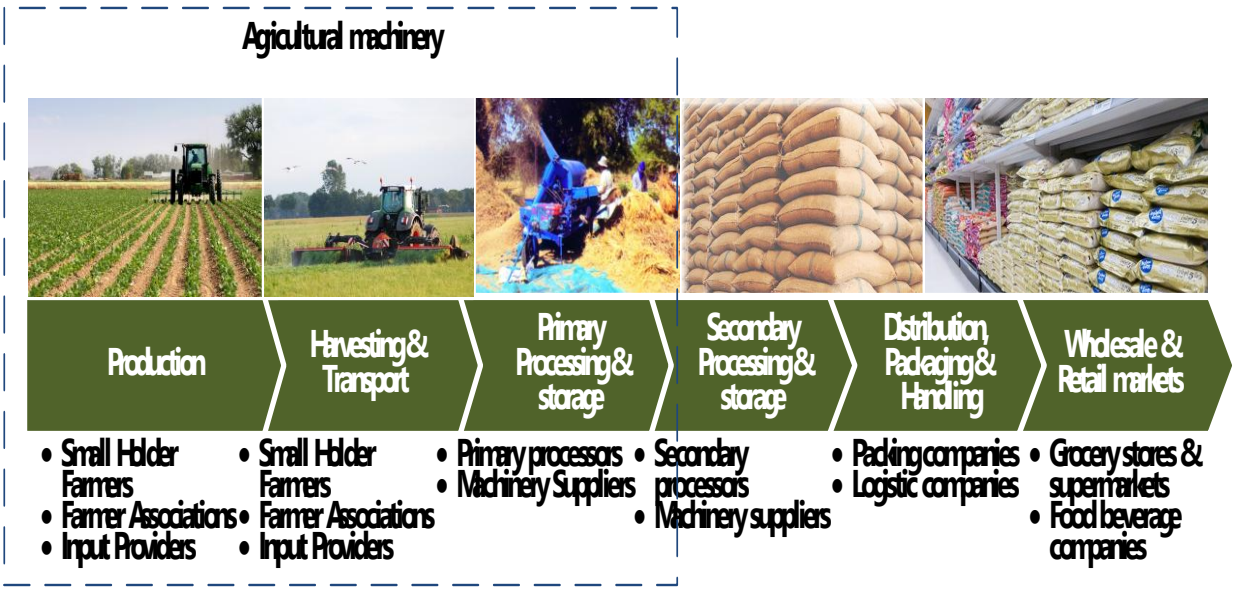
2. Literature Review

Thailand has an area of about 321 million rai or about 513,000 square kilometers. The area for agriculture is about 43% (138 million hectares), and agriculture accounts for 10% of GDP (OECD, 2013). As for agriculture, meeting the challenge of greater productivity and income and employment security requires further efforts to modernize and to educate farmers in the use of technology (OECD, 2013). During this time, mobile technology

is in place, the digital inclusion policy is aggressively implemented in Thailand which could guarantee that Thai farmer digital accessible. To focus on management and technology used by farmers to make more profit or Smart Farming meanwhile the farmer is an entrepreneur (Bukht & Heeks, 2018).

The Agricultural Value Chains: In the agricultural value chain, when farmers select crops that are suitable for the season, improve the yield and produce the desired quality, they must invest in agricultural production by purchasing inputs such as seeds, plants, fertilizers and phytosanitary products. Agricultural tools are important inputs in the value chain of agriculture especially in the era when agricultural labor is lacking, while demand for agricultural products continues to grow. However, for the agricultural sector, investing in machine tools wisely would reduce production costs and result in higher incomes for farmers. Figure 1 shows the use of agricultural tools in the agricultural value chain (Agricultural value chains, 2018).

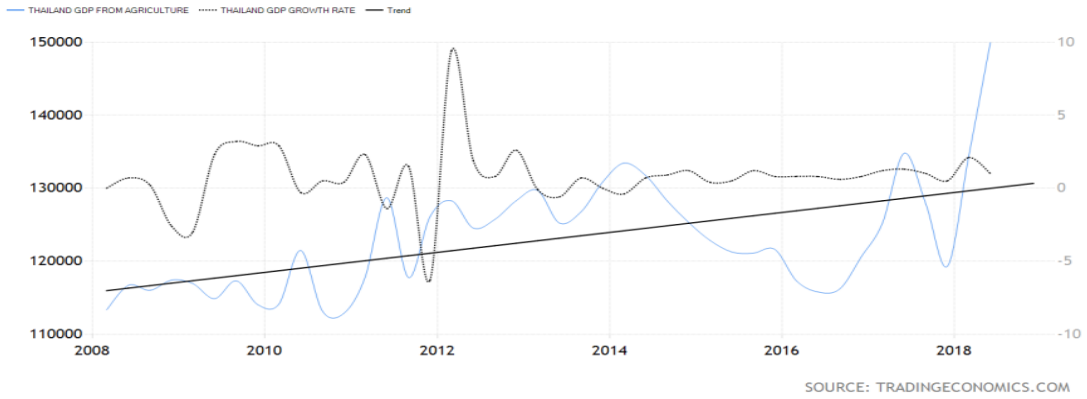
Figure 1: The Uses of Agricultural Tools in the Agricultural Value Chain (A Typical Agricultural Value Chain, 2018)



Newer farmers are turning to machines to increase agricultural productivity in a meantime advanced technology has changed the way of life, business, and the world economy. Technology leads to changes in people the lifestyle and business approach. Business sectors initiate new products and services to raises the total value between manufacturers and consumers.

Thai Government Support Policy: Thailand's government in 2016 introduced "Thailand 4.0", an economic model designed to break Thailand out of the middle-income trap. For agriculture, Thailand 4.0 aims at a seven-fold increase in average annual income of farmers from 56,450 baht to 390,000 baht by 2037. Thai farms are small-43 percent of them are smaller than 10 rai, and another 25 percent are between 10-20 rai. These small plots are already mechanized-90 percent use machinery. Concomitantly, agricultural research budgets have dropped from 0.9 percent of agricultural GDP in 1994 to only 0.2 percent in 2017. Meanwhile, the population ages the World Bank estimates that by 2040, 42 percent of Thais will be over 65 years old (Agriculture in Thailand, n.d.).

Figure 2: Thailand GDP From Agriculture (Trading Economics, n.d.)



The Trend of Mobile Technology in Thailand: E-Services and mobile commerce have been adopted by various industries and government services. The usage of smart phone is widely used in Thailand (more than 120 Million numbers). However, the internet usages of smartphone are games and social media applications.

Figure 3: Mobile Subscribers in Thailand (NBTC, 2018)

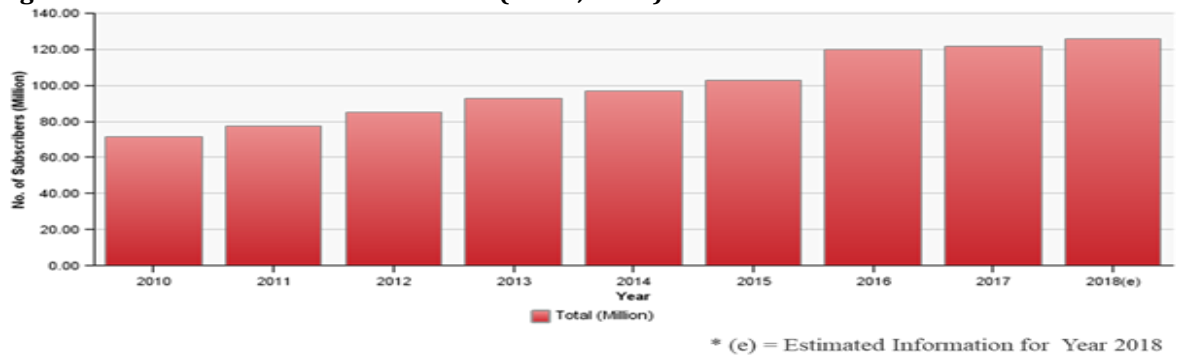
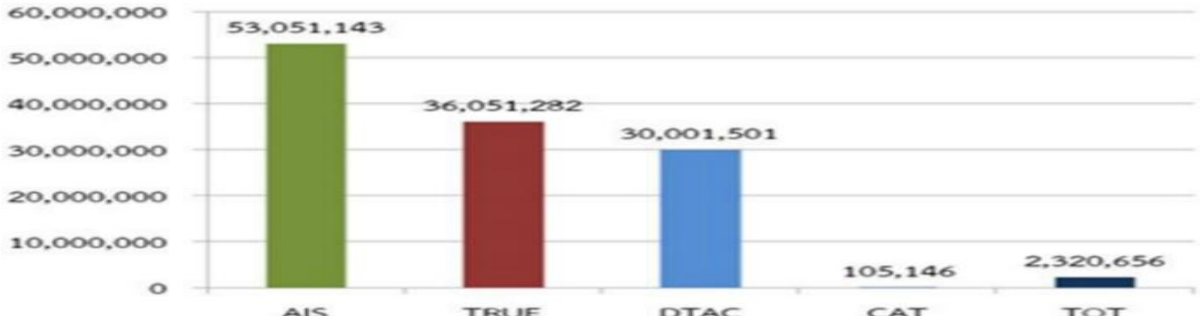


Figure 4: Number of Mobile Subscribers Classified by Service Provider (it24hrs, 2018)



The social media and e-Commerce models are more and more popular in Thailand Number of Facebook and line users are rapidly increased. There's no need for training how to use Facebooks and Lines. The implementation of mobile application based on social media and web will impact farmers and create more impact to the economy. The statistic declares by Thailand Office of National Broadcasting and Telecommunications Commission (2018) show that mobile subscribers in Thailand have been increase from 60 million up to more than 120 million within nine years. For voice data of 3 major operators, between 2557 and 2560, there will be a continuous decline. By the year 2014, the volume of voice services is 70,720.42 million minutes in 2015, down to 62,851.09 million minutes, in the year 2019 down to 51,021.48 million minutes and in 2560, there were 43,460.84 million voice services. In the year 2017, Thai people use their

voice over cellular service for an average of 2 minutes per person per day, down from the previous year's average of 4 minutes per person per year provider (it24hrs, 2018) .

Social Media and Social Networking: There are many researches and developments to show the implementation of using social media in conglomerated organization like PTT PCL (Chatchalearmpol, Pongsuwan, & Vachalobol, 2016). The smart labor that using social media to solve their worker pickup problem (Khongmanee, Pongsuwan, & Thanawastien) show the relationship with GPS and mobile application to solve smart labor and their transportation to work, Social Communication for Smart Farmers in Durian Society in 2016 show the relationship and combined lifestyles of durian farmers with their customers via social media. (Doungvichitkul, Pongsuwan, & Thanawastien, 2016). However, the shared equipment like UBER (https://www.uber.com/) or GRAB for shared farmer equipment is not existed in Thailand. Social media and social networking has become a new marketing tool for business where anyone can share opinions and attitudes for their services and any related information. Currently, social media has changed and updated over time in the various contexts of technology development, which influenced human behavior in these days whether communication via the internet or search engine to seek any useful information in daily life, including e-commerce and entertainment activities.

Farm Sharing Model: Sharing farm machinery is implemented in many countries. For example: Basarik and Yildirim (2015) (Doungvichitkul, Pongsuwan, & Thanawastien, 2016) showed interesting model in Turkey. These are State Machine Park Neighbor assistance, Farm machinery contractor, Machinery partnership, Machinery cooperatives and Machinery rings. Their research found that in Turkey shared farming equipment help in farmers and cooperative to justify demands and supplies but it's still many idle machine and human in the supplied-chain and still has difficulty to control time and places to improve efficient of these farming equipment's.

3. Research Methodology

In addressing this issue, comparing to the vast emerging mobile technology platform that applies to passenger vehicles leverages positive indirect network effects between the supply side and the demand sides – like Uber, Grab, etc. – many perceived this as one of the disruptive technologies. Provides a vision of creating holistic and individual farmer through technology, along with examples in the form of adaptive usage an overview of the ecosystem technology to support such a vision is described. This includes monitoring systems, maintenance platforms, and data-driven models to measure the prevalence of the farmer. Finally, this research offers a roadmap for creating a concept for building a collaborative and connected mobility model to share agricultural equipment. This study aims to adopt those models to create a collaborative and connected mobility model called 'Shared Agricultural Machine for Smart Farmer' (SAM-SF). This article will discuss important considerations, including the need for challenges, trends, and opportunities for farmers to have machinery when needed and to share what idle with others via our technology. This research using constructive research model aimed to design, construct, and demonstrate on a mobile application name T-Farm on play store and app store. Within the app, farmers together with equipment owners can connect and create a relationship with farmers to farmers, farmers to equipment owners and equipment owners to equipment owners, these relationships create new kind of social media that bring more efficient social power to the shared farming equipment.

The Design and Implementation of T-Farm Application: We developed an application on smart phone and host this app on google Play store and apple Appstore using the name T-Farm. T-Farm has ability to share tractors and other farming equipment such as harvester and cutting glass equipment. By next year, we decide to implement B2B marketplace for matching all truck and labor to provide more efficient farms and smart farmers. The model name Shared Agricultural Machine for Smart Farmer Model was created as shown in figure 5 and figure 6.

Figure 5: Shared Agricultural Machine for Smart Farmer Model

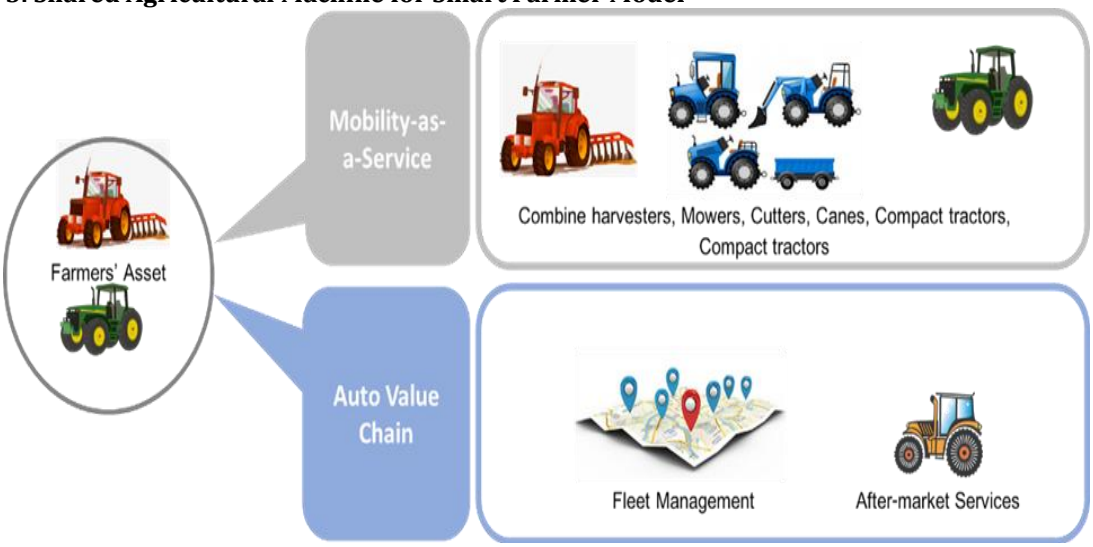
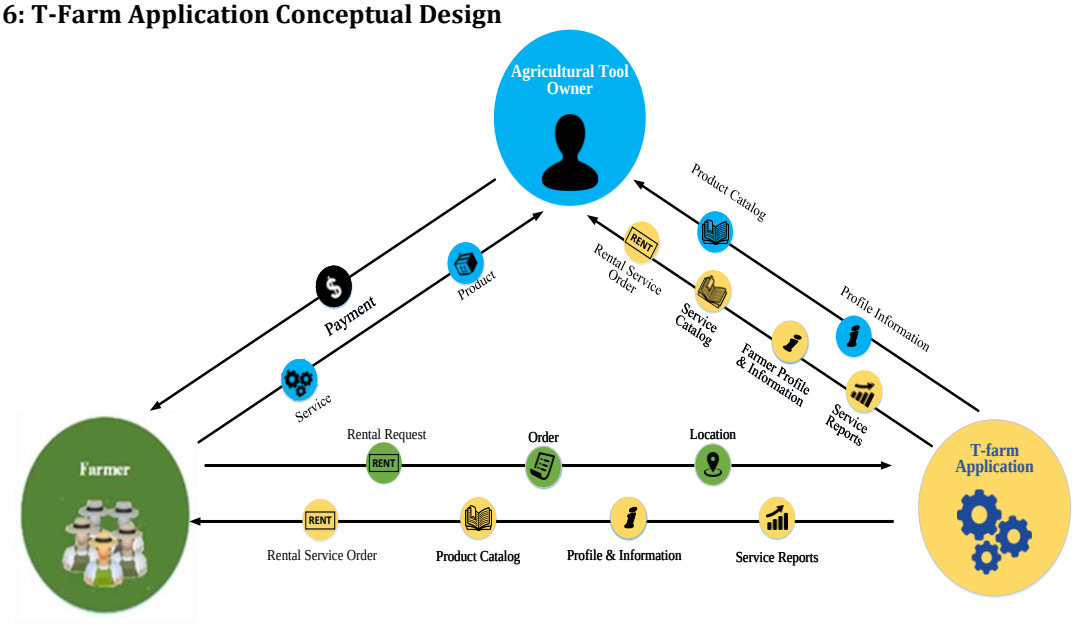


Figure 6: T-Farm Application Conceptual Design



Business Process Modeling: We used android studio to build application on google android phone (JAVA) and swift X-Code for IOS. The design of the program based on web and MS-SQL and C# on server. Farmers just choose what kind of machine he wants and point and click on location and time that are needed to deploy service on location. This model will provide accurate and precision time to service (no more waiting time for farmers and equipment). Figure 6 showed BPM notation of T-Farm development. Figure 8, 9 and 10 showed the actual implementation and real work of the application.

Figure 7: T-Farm Workflow Using BPM Notation (Business Process Model and Notation, n.d.)

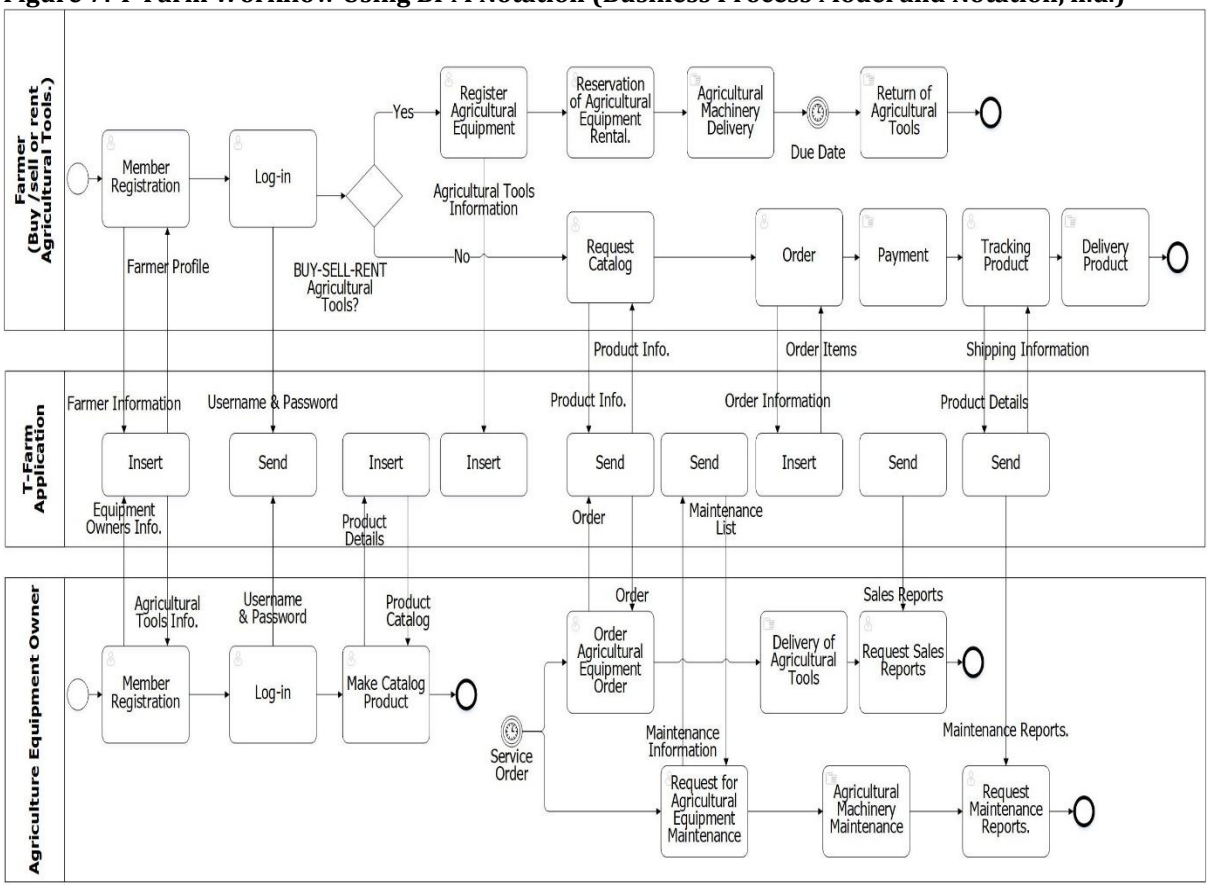
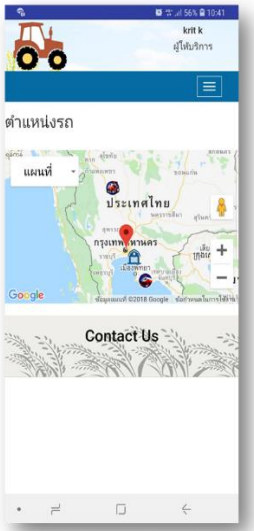


Figure 8: T-Farm Mobile Application

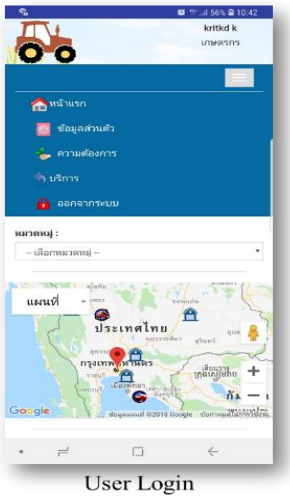
Switching MODE: between Tractor owner / Farmer



Default Page: showing current Machine Location

Registration Page

Figure 9: T-Farm Application Service both Farmers and Equipment Providers via Location Based (GPS) on Smartphone

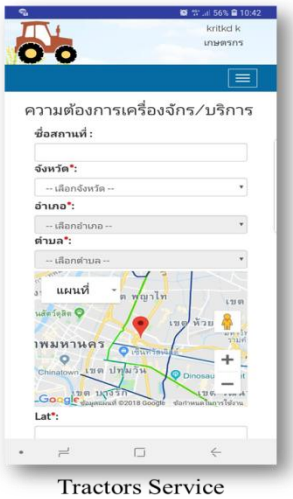


User Login

Main Menu

Figure 10: T-Farm Application Show Input Form to Match between the Demand and the Availability of Farming Machine

Tractors Service Available



Tractors Service Request

4. Results

To evaluate the usability and benefits of using SAM-SF for farm machine sharing, we have selected a sample of 80 farmers to use SAM-SF to share their machines among them and experiment on the generation of various sharing models. Then they input availability of theirs machines and use SAM-SF as a collaboration tool to share their machine during the period from Jan 2017 to December 2017. After which, they answered the set of questions and a set of Likert-scale assessment. These volunteers will be referred to as respondent in this section.

Evaluation: In the evaluation of SAM-SF, the respondents were 60% using machine for production, 30% using machine for harvesting, and 10% using machine for primary processing & storage. Our respondents are farmers who experience using mobile phone.

Findings: The respondents are 65 % farmers who own agricultural machine and 35 % are farmers who do not own any agricultural machine. Most of them are young adults between 22 and 40 years old. We also collect the annual income, and information about their planting crops and its season for production,

harvesting and primary processing & storage. A total of 20% of the respondents plant their crops at the beginning of rainy season, in May to July and 30% plant their crops Planted before the end of rainy season, in December to February and the rest 50% planted their crops all year round. Harvesting and primary processing & storage duration are various based on what kind of crops and theirs yield. Overall, the respondents, after using SAM-SF for trip planning and real-time adjustment of the trip plan feel that the SAM-SF is a trusted tool for sourcing farming machinery when needed. Compare SAM-SF to the conventional advice from friends and internet search, the SAM-SF recommends available machine is very acceptable in terms of where it located, how far of the available machine form the farm (distance between farm and the available machine), information about the machine as well as the rental model.

5. Conclusion

This model is an experiment for Thais farmer in relationship with smart equipment and internet technology. The result show that more than 90% of the sampling (Thai farmers) satisfied with this model.

SAM-SF is an essential tool for a farmer to collaborate their machine sharing. A user can specify types and number of machines needed with related information including the specific features, or let the system retrieve available machine nearby shown on the google map. The user can use SAM-SF to offer their idle machine to others by check-in the machine location and brief description about its functions as well as taking the photo of the machine using mobile device. During using the machine, the owner can use SAM-SF to monitor his asset borrow to other. After all processes, the user can manage his assets back to his farm or sending directly to the new matching farm, if any. Since SAM-SF interfaces with google mapping function, it derives all the benefits of identifying current position, time to destination, street view, and alternate route.

From the evaluation data, most of the people who have used the SAM-SF gave very favorable rating. So, to deploy SAM-SF for public use, a cloud-based implementation can be carried out so that it can be accessed from any location. Moreover, the model itself can be generalized and extended to cover over all farming area in in Thailand. As for extending work, the development a farming network base on the concept of SAM-SF Platform, which not only the farmers can register to share various agricultural tools, but also manufacturers of machine tool vendors and other agricultural products can be registered for purchase, offering, and maintenance services through the SAM-SF Platform. This future work must also take into consideration of create trust model using blockchain and smart contract to ensure all real matching deal including payment method to receive and pay rental fee or service charge. In summary, SAM-SF is a new way for farmers to collaborate in real time to build a peer-to-peer network of sharing agriculture machinery and equipment.

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Financial Behavior of Working Women in Investment Decision-Making

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Abstract: The purpose of this study is to measure the level of financial literacy of working women, to describe assets allocation, as well as the time and profit in investment. This research paper is a qualitative study using the descriptive method. Noting the purpose, it is suitable if the qualitative approach was implemented. The respondents are working women with most of them have been married, 16-22 years old on average, have a bachelor degree, and work in the government sector with the majority of the income is more than 4.000.000 rupiahs. Those respondents' characteristics will influence their choice in doing investment because it is associated with the tolerance of risks. The first form of behavior and preference of investment done by working women is that majority of them have thought about investment plan and most of the respondents think that everyone can get profitable investment if they do financial planning and saving/investment. The second form of behavior is that the majority of respondents are more interested in property investment. The third form of behavior motivating working women in doing investment is themselves, like retirement planning and family security reason. Based on the study, it shows that working women have high financial literacy which is indicated by their discipline in doing the investment of their excess money, thus they have control over their finances and believe to get investment profit they should do financial planning.

Keywords: *Financial Behavior, Working Women, Investment Decision-Making, Financial Literacy, Assets Allocation.*

1. Introduction

According to the data of Regional Office of Manpower (East Java Province in Figures, 2017), there is the increasing number of labor in East Java, noting that in 2012, there were 524.381 male job seekers, then it declined by about 116.061 into 408.320. While for females, in 2012, there were 209.840 of female job seekers which rose as much as 145.014 into 435.854. From those 2012 data, female worker placement is greater than a male worker. It is 67.96% of the female worker had a job while it is only 52.88% of the male worker had a job. The greater number of female job seekers absorbed indicates the more job vacancy for women. The increasing number of female workers needs to be balanced with the quality of workforce education. This is also indicated by the direct proportional between the increasing number of working women and the level of women's education due to the quality of working women becomes one of the requirements that need to be considered. Many companies began to apply the minimum requirement, bachelor graduates, in their requirement which can be seen from the higher number of university graduates absorption comparing to High School graduates. Based on the national workforce survey, the unemployment rate of university graduates in 2014 is only 43.987 lower than the unemployment rate of high school graduates reaching 204.982 (East Java Province in Figures, 2017). According to the Central Statistics Agency of East Java, the number of women who completed bachelor degrees increased to 5.55% in 2011 from 5.36% in 2010.

The more working women also support the increase of family income because the family income which formerly only comes from the husband is added by income from the wife. Women who work will contribute to the increase of family income, that is, it can encourage the family to invest (Mincer & Polachek, 1974). With women's role becoming increasingly important in families and communities, it is important to examine behavior in working women. Investment in a broad sense consists of two main parts, namely investment in the form of real assets and investment in the form of securities or financial assets. Real assets are tangible assets such as gold, diamonds, silver, art and real estate. Financial assets are securities that are a claim of real assets controlled by an entity (Hartono, 2003). The investment decision-making process is a process that describes how an investor decides the type of investment, how much investment, and when the investment will be made. Decision-making, in general, is a complex phenomenon encompassing all aspects of life, involving various dimensions, and the process of choosing from the myriad options available. Decision-making theory is based on the concept of satisfaction, that is, the utility is the amount of pleasure or relative

satisfaction achieved. With this amount, individuals enable to determine the increase or decrease of utility to increase satisfaction. Having this concept, each action is to maximize the amount of utility to achieve satisfaction.

Hence, investment decision making is made rationally to maximize its utility. At first, the investors in making investing not only estimate the prospects of investment instrument, but also the psychological factors, which contribute to determining the investment. Even, various parties stated that the psychological factor of the investor has a significant role in investing. Investment decisions are influenced by investors' biases and prejudice that will affect assets' prices. The existence of these psychological factors gives an impact on the investment and its result achieved. Thereby, an investment analysis using psychology and financial science is known by Behavioral Finance. Behavioral Finance has emerged as a new discipline that seeks to understand the psychological and financial interaction to develop models and theories to have a deeper and better understanding of the investment decision-making process and their impact on financial markets. Financial Behavior departs from classical finance theory due to it recognizes that investors will be influenced by psychological and emotional factors (Mittal, 2010). Shefrin (2000) defines behavioral finance as a study of how psychological phenomena influencing their financial behavior. The behavior of stock players, which Shefrin (2000) stated, is about practitioners' behavior. Baker & Nofsinger (2010) defines the behavioral finance is a study examining how humans behave in a financial setting.

Especially, learning how psychology influences the decisions of finance, corporate and financial markets. Thus, the financial theory explains how individuals should make financial decisions while behavioral finance shows how individuals make a financial decision. Hinz, McCarthy, & Turner (1997); Byrnes, Miller, & Schafer (1999); and Bernasek & Shwiff (2001) examining investment behavior found that women were more risk-averse than men, while Sunden & Surette (1998) claimed that gender and marital status were significantly associated for asset allocation. Hibbert, Lawrence, & Prakash (2008) disclose that risks related to gender, age, income, wealth, marital status, race/ethnicity, and the number of children under 18 in the family. Olsen & Cox (2001) found that women are more risk-averse than men when faced with social and technological dangers, even when both have the same expertise and experience. Recent studies have reported that women are more at risk-averse and more at choosing less-risky pension assets comparing to men (Yuh & Hanna, 1997); (Sung, 1997); (Bajtelsmit & VanDerhei, 1997); (Selvi, 2012); (Bahl, 2012); (Indrawan, 2014); dan (Retno, 2014). Since stocks and personal businesses are usually viewed as a low-risk investment, it is expected that women will choose less frequent types of assets than men. It is also expected that women will invest a greater proportion of their portfolios in low-risk investments.

The lower risk assets, in this case, are real assets. Other research Indrawan (2014) dan Retno (2014) found that age, educational level, status, number of dependent family members, ownership of house and land affecting investment decision of working women. Indicators of investment capacity which can be measured based on investor wealth, investment objective, attitude to risk, and investment period has been proven to be a primary determinant of choice among investment asset classes (Butler & Domian, 1991). Based on the formulation of the problem, the specific objectives of this study are **first** to measure the financial literacy level of working women; **Second**, the description of asset allocation, time and the desired level of profit in investing in working women; **Third**, testing internal factors such as education level, status, sex, length of work and number of members covered and factors of home ownership, land ownership and access to credit that affect investment decisions of working women. The advantages of this study are compared to previous research: **First**, this study is more comprehensive and in-depth in exploring investment behavior of working women starting from measuring the level of financial literacy to the meaning behind the investment decisions taken; **Second**, this research is rarely found in the field of financial management, because it is related to personal finance; and **Third**, in the end this research will bring up the conceptual model of investment decisions for working women

2. Literature Review

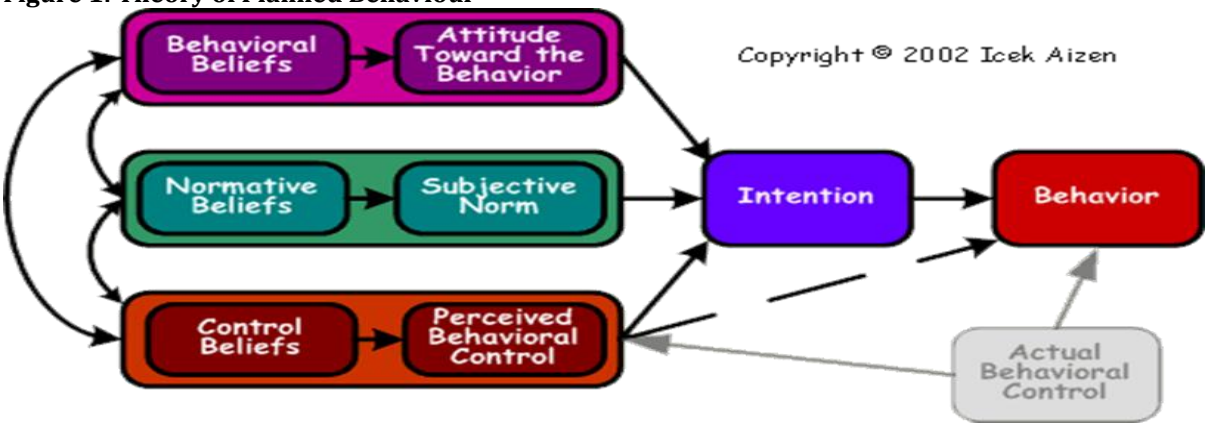
Theory of Planned Behavior: Theory of Planned Behavior (TPB) was postulated by Icek Ajzen in 1985 as the extension from Theory of Reasoned Action. There are three variables of the Theory of Planned Behavior.

Attitude: Attitude refers to a general feeling expressing a person's favor or against an object that drives his response, both in the form of positive and negative responses (Ajzen, 1985). Attitude is a general evaluation created by the human against themselves, others, objects, or issues (Azwar, 2000). According to Notoatmodjo (1997), attitude is a reaction or a person's response that still close to a stimulus or object. Also, according to Purwanto (1998) attitude is views or feelings that are accompanied by the tendency to act according to the attitude of the object. Allport (1954) used a two-component approach; attitude is defined as a mental and neural stage of readiness, organized through experience, pursuing a directional and dynamic influence on the individual response to all related objects and situations. To make a clearer understanding, researchers will use one of the empirical indicators of attitude, that is, knowledge. In the previous study, Chen & Volpe (1998) explained that education in financial management has a significant relationship in making important investment decisions. Chen & Volpe (1998) concluded that the influence of individual financial knowledge levels influences them in the decision-making process. Knowledge is like a stimulus for people who do not know. Similar to investment products, investment products are seen as knowledge. People who already understand about investment products will, at least, know the benefits and the risks. This, after knowing investment products, women will be interested try to invest in those products.

Subjective Norms: According to Kreitner & Kinicki (2001), subjective norms are interpreted as an acceptance of social pressure to show a specific behavior. Ajzen & Fishbein (1977) explained that subjective norms are individual perceptions related to most of the people who are important to him expecting individuals to do or not to do certain behaviors, those who are important to him then be used as a reference or benchmark for directing behavior. Based on Mowen (1995), subjective norms value is something that is believed by the consumers that they should do based on people's assumptions. In other words, subjective norms include strong influences from the promoter group into the formulation of a behavior. According to Dharmmesta (1998), subjective norms are social factors that show the perceived social pressure to perform or not to perform actions/behaviors. Ajzen (1991) explained that subjective norms are perceived social pressure to perform or not to perform the behavior. The subjective norm refers to the influence of family, colleagues and the social environment. Suppose in everyday life we hang out with friends who smoke. Because of many friends who smoke, then we will also participate in smoking. The environment can affect one's behavior. For investment products themselves, the intended environment is related to the social environment. For example, when you meet your neighbors who invest in one investment product and then he tells the profits he gets, then it will encourage us to invest in the mentioned product.

Perceived Behavior Control: The perceived behavior control is perceived ease or difficulty in performing the behavior (Ajzen, 1991). The perceived behavior control is usually thought to consist of difficulty and controlling factors (Ajzen & Fishbein, 2000). The perceived behavior control is a function of a control belief and easy access to the factor of the belief control, a control is the presence or absence of resources and opportunities required to perform certain behaviors, whereas an easy access to the control factor is an assessment of one's interest in resources to obtain the expected outcomes of behavior (Chang, 1998). Control is very important than attitudes and norms, it is said so because it can directly affect behavior. For example is money, in this case, a student who has the funds can just buy the available investment products, they can also find out the new investment products then he/she will be dare to invest. The next thing, if the three things are met and there is an interest, then we just need to wait for the decision to invest. In conducting research on the behavior of an investor, several aspects are needed to be learned that is about investment planning Bahl (2012); Jisha & GoMathi (2017), how the asset allocation Bahl (2012); Warren, Stevens, & McConkey (1990); Rajarajan (2000), the reasons of doing the investment Bahl (2012); Jain (2014); and its resistance to a risk (Eckel & Grossman, 2002); (Gneezy, Leonard, & List, 2009).

Figure 1: Theory of Planned Behaviour



Investment: According to Tandelilin (2010), investment is a commitment to several other funds or resources being made at the moment, aimed at gaining some profit in the future. According to Hartono, (2003), investment is a delay of now consumption to be used in an efficient production over a certain period. According to Sunariyah (2003), investment is a capital investment for one or more owned assets and usually a long-term asset in the hope of gaining profit in the future. Sources of funds for investment can come from owned current assets, loans from other parties, or savings. Investors who reduce their current consumption will have the possibility of excess funds to save. According to Heidi Hartman, family income is the birth base of the labor division by sex, because it is based on the notion that women are not expected to generate an economic contribution to households, and that women's work priority is on domestic responsibility. In reality, few families resemble that myth. The funds derived from the savings, if it is invested, it will provide hope of increased consumption ability of the investor in the future, which is obtained from improving the welfare of investors (Tandelilin, 2010).

More specifically, Tandelilin (2010) outlines some of the reasons for people who do investment, among others, as follows:

- To get a better life in the future, a wise man will think about how to improve his or her life from time to time or at least try to maintain his income level in order not to diminish in the future.
- To reduce the inflation pressures, by investing in the ownership of a corporation or other object, a person may avoid the risk of impairment of property or property due to the influence of inflation.
- To encourage saving on taxes. Some countries in the world do many policies that encourage the growth of investment in society through the provision of tax facilities to people who invest in certain areas.

Investment in the broad sense consists of two main parts, namely: investment in the form of real assets and investment in the form of bonds or securities (financial assets). Real assets are tangible assets such as gold, diamonds, silver, art and real estate. Financial assets are bonds that are claims of real assets controlled by an entity (Hartono, 2003).

Investment Decision: Investment decisions are an important factor in the financial function, that the value of a company is solely determined by the investment decisions. The statement implies that investment decision is important because to achieve the company's goal of maximizing wealth (wealth), the shareholders will only be generated through corporate investment activities (Hidayat, 2010). As already mentioned, the advantage (return) derived from investment activities are generally capital gains and dividends. The earned dividend is determined by the company's ability to make a profit. Meanwhile, capital gains are influenced by fluctuations in stock prices. The ability of companies to earn profits is influenced by micro and macro factors, which in turn will affect the fluctuation of stock prices, and will raise investment risk (Rahadjeng, 2011).

Financial behavior has a significant role in making investment decisions. Decision-making is a process of selecting the best alternative from several alternatives available under the influence of complex situations.

Investment decision-making will be greatly influenced by the obtained information as well as investor knowledge of the investment, whereas each investor has a different level of ability and knowledge. Investment decision-making is influenced by (1) the extent to which investment decisions can maximize wealth, and (2) behavioral motivation, investment decisions based on investor psychological aspects. Investment decision makers do not always behave consistently with assumptions made by perceptions and understanding of the received information (Christanti & Mahastanti, 2011); (Jahanzeb, Muneer, & Ur-Rehman, 2012); (Peteros & Maleyeff, 2013).

The Concept of Work and Family Income: Talk about work is usually associated with productive work and unproductive work. Productive work is usually associated with men's work in making money while unproductive work is usually associated with house chores that do not directly generate money. Some theories argue that house chores can be analyzed by using a framework of self-analysis as productive work. Although women also work to earn a living, many women's jobs are not considered equal to productive work done by men even by women themselves. Efforts to improve this condition can only be done by looking back at the definition of work in different ways because women are more involved in unpaid work, house chores, and family businesses, etc. By assigning a value to women's work equivalently to men's work, even though women's jobs often do not result in the form of money, because the value of a work is not assessed in the form of money only. Therefore, there is no reason to consider women's work unequally to men's work just because women's jobs do not make money. There are other issues that also need to be considered when we talk about working women this is related to how society and women themselves in assessing the income of working women.

3. Research Methodology

This study is a descriptive study, which attempts at solving the problem by illustrating the prevailing problems. It is based on the consideration that researchers wanted to understand, examine in depth, and present, in this paper, about investment decisions by working women and problems found as well as the way to face it to create good and optimum investment decision-making. Based on this reason, this study used a qualitative approach. No matter how big the income of working women is, they are still regarded as an additional livelihood, which is closely related to the stereotype that men as the head of the family and the main breadwinner. The population of this study is women lecturers and the academic staff of the Economics Faculty. A random sampling technique was used in this study. A random sampling technique was used in this study.

The research sampling technique used in this study is saturated sampling. Saturated sampling technique is a sampling technique if all parts of the population are used as research samples. Data analysis is the process of finding and organizing interviews and records obtained in the field and other materials that have been collected to formulate the results of what has been found. Relevant to the type of research that is qualitative research with the descriptive method, the analysis technique used is qualitative analysis techniques. The data that has been collected in the form of words from various sources are analyzed intensively. The data analysis was done using a qualitative data analysis technique by giving an intensive analysis of data obtained using words. Some steps used to analyze the data are mentioned below:

Data Collection: In a qualitative study, the data was collected from field/empirical evidence to compose theory from the data.

Data Classification: The first classification of data includes whether the women working invest or not. Then, it would be analyzed the composition of investment for these following categories.

- Stock investment
- Investment in financial instruments
- Insurance investment
- Risk-Free Investment (Savings & Deposits)

Data Presentation: Data presentation was intended to facilitate the researchers to see the statistical description of the proportion of investment made by working women.

Conclusion: After the data presentation step, the initial conclusion could be drawn. The conclusion made was also reached during the research. From the beginning until the data collection process, the researchers attempted to do analysis and find the meaning of what has been collected.

4. Results and Discussion

This study took a sample of female academicians of the Faculty of Economics Universitas Negeri Surabaya which consists of employees, lecturers, students, alumni, and 'dharmawanita' (an organization for the wives of Indonesian civil servants) as many as 100 people. The following will be described the research data expressed in the tabulation form.

Table 1: Demographic Characteristics of Respondents

No	Criteria		Percentage
1.	Age	16 – 22	2.4%
		23 – 30	48.8%
		>30	48.8 %
2.	Education level	Primary	0
		Middle	0
		High	2.4%
		Associate degree/bachelor degree	50%
		Master degree	38.1%
		Doctoral degree	9.5%
3.	Marital status	Single	48.8%
		Married	51.2%
4.	Occupation	Working in Government Sector	57.1%
		Working in the Private Sector	47.6%
5.	Income	500,000 - 2,000,000	3.6%
		2,000,000 - 4,000,000	45.2%
		>4,000,000	51.2%

Table 2 below shows that the majority of working women have considered about investment plan. Notwithstanding that, the investment plan is only in their mind and has not been got further execution; it becomes the starting point to develop the next investment plan. The result can be seen from the third statement, which has a higher average score compared to others, that is 3, 22.

Table 2: Investment Planning Status of Working Women

No	Statement	Score 1(STS)	2(TS)	3(S)	4(SS)	Total	Average
1	I have an investment plan that has been developed.	4%	16%	51%	29%	100%	3.04
2	I have problems in developing my investment.	9%	43%	37%	11%	100%	2.49
3	I am thinking of developing an investment plan.	3%	4%	62%	32%	100%	3.22
4	I am not thinking at all about the investment plan	73%	21%	7%	0%	100%	1.34

Table 3 shows the perception of working women about the precise time for doing investment planning. There are some possibilities of time used, they are: in the beginning time of joining company/business, as early as

possible in the workplace, and in the middle of having a job. The result shows that the majority of respondents think that the best time to do investment is at the beginning of joining an organization or company. It can be seen from the second statement, which has a higher average score compared to others, that is 3, 07. According to some respondents, an earlier period of working is the time when people attempt to understand and learn about the job description, they are often more confronted with two things, understanding the job description and do the job, or unable to understand the job description and make investment from their salary obtained from early months of working (by getting that monthly salary, it will boost financial independence).

Table 3: Working Women Perception of the Right Time to Do Investment Planning

No	Statement	Score 1 (STS)	2(TS)	3(S)	4(SS)	Total	Average
1	The best time to start planning investment is in the beginning when someone joins a company.	14%	29%	41%	16%	100%	2.60
2	The best time to start planning investment is as early as possible in the workplace.	1%	23%	44%	32%	100%	3.07
3	The best time to start planning investment is in the middle of a job.	14%	39%	42%	5%	100%	2.39

In table 4 below shows the type of investment option. There are several possibilities of women workers in choosing investment types such as stocks, mutual funds, bonds; insurance; savings, deposits; gold; property; and other investments. The result shows that the majority of the respondents feel more interested in this type of property investment. The results can be seen from the fourth statement that the average of the score is greater than the other, which are 3.41. The second most popular type of investment is an investment in the form of savings and deposits. Based on these results, it indicates that the respondent is a risk-averse investor type (risk avoiding). The results are inseparable from the culture of employees in the minds of women workers, so the majority does not dare to take risks as usually done by the respondent who has an entrepreneurship background.

Table 4: Types of Investment

No	Statement	Score 1 (STS)	2(TS)	3(S)	4(SS)	Total	Average
1	I prefer investments in the form of stocks, mutual funds, bonds.	23%	45%	27%	4%	100%	2.12
2	I prefer investing in insurance.	22%	37%	30%	11%	100%	2.30
3	I prefer investing in savings, deposits.	5%	7%	42%	46%	100%	3.29
4	I prefer investing in gold.	3%	13%	47%	37%	100%	3.19
5	I prefer investing in the form of land, buildings (property).	1%	7%	41%	51%	100%	3.41
6	I prefer investment in other forms.	27%	31%	28%	13%	100%	2.28

Table 5: Reasons to Invest

No	Statement	Score 1 (STS)	2(TS)	3(S)	4(SS)	Total	Average
1	I invest because I want high returns.	3%	15%	45%	37%	100%	3.16
2	I invest because I want the benefits/tax advantages.	12%	39%	39%	11%	100%	2.48
3	I invest because there is an emergency need/vigilance motive	7%	21%	45%	28%	100%	2.93
4	I invest due to retirement plans.	1%	4%	41%	54%	100%	3.47
5	I invest for family security.	1%	4%	43%	52%	100%	3.45
6	I invest in children's education.	3%	7%	36%	55%	100%	3.43
7	I invest to use it in the future.	8%	24%	51%	17%	100%	2.77
8	I invest for other reasons:	28%	35%	25%	12%	100%	2.21

In table 5 above shows the reasons for women workers in doing an investment. The result shows that the majority of respondents are investing due to pension plans. The results can be seen from the fourth statement that the average of the score is greater than the other, which are 3.47. The results are not separated from the culture of the employees and the majority of respondents are working in government then the idea of retirement becomes the reason to do an investment. Also, the second reason for women workers to invest is family safety. The results can be seen from the fifth statement that the average of the score is greater than the other, which are 3.45. The first and second greatest answers have a high correlation, if it is concluded then the reason for the respondent to invest is to keep the family safe with the preparation of the pension program.

Table 6: Investment Supporting Subject

No	Statement	Score 1 (STS)	2(TS)	3(S)	4(SS)	Total	Average
1	Oneself	3%	7%	47%	43%	100%	3.32
2	Husband	18%	14%	41%	27%	100%	2.76
3	Siblings/ Close family	18%	31%	40%	11%	100%	2.44
4	Parents	12%	18%	45%	25%	100%	2.82
5	Friends/ Peers	16%	31%	49%	4%	100%	2.41
6	Investment Company	25%	43%	28%	4%	100%	2.12
7	Others	38%	36%	22%	4%	100%	1.93

Table 6 above shows that what drives women workers to invest is themselves. The results can be seen from the first criterion that the average score is greater than the other, which are 3.32. Besides them themselves that become the reason to invest, respondents also feel that parents also encourage the occurrence of investments made by respondents.

Table 7: Aspects of Investment Planning

No	Statement	Score 1 (STS)	2(TS)	3(S)	4(SS)	Total	Average
1	I am disciplined in saving / investing	1%	17%	66%	16%	100%	2.96
2	I have control over my finances	1%	4%	59%	36%	100%	3.29
3	I enjoy doing investment planning	0%	1%	70%	29%	100%	3.27
4	I often invest money when I do not plan to buy anything	3%	20%	46%	32%	100%	3.07
5	I think preparing for investment takes a lot of time and effort	8%	30%	45%	17%	100%	2.71
6	I think everyone can get a profitable investment if they do planning and saving/investing	0%	7%	51%	43%	100%	3.36
7	I am willing to take risks to make a profit	7%	34%	50%	9%	100%	2.62
8	I'm more thrifty than an investor	8%	50%	39%	3%	100%	2.37
9	I do not want to take the financial risk whatever the result is	9%	42%	41%	8%	100%	2.47

Table 7 above shows the aspects of investment planning. Based on the results of the study, it showed that women workers have good financial literacy. This discipline is also supported by investing the excess money if they do not have a plan to buy an item. These planning and disciplinary actions are due to these women workers having control over their finances (3.29). The generated income is indeed used to support family finances but they are not as the breadwinner for their family. Good financial literacy is also demonstrated by the full support (3.36) of investment planning because, to gain investment benefits planning should be done.

5. Conclusion

The majority of respondents of women workers have married with the average age of 16-22 years and with Bachelor as the majority education background, and work in the government sector with majority revenues ranged above Rp 4,000.000,-. The respondent's characteristic will influence the choice of investment because it is related to its tolerance for risk. The first form of investment behavior and preference of women workers is that the majority of women workers have thought of an investment plan. Although the investment plan is still in their mind and has not been further developed, the thinking phase of the investment plan occurs in the initial time of joining an organization or company. The second form of investment behavior and preference of women workers is that the majority of respondents feel more interested in the type of property investment. The second most popular type of investment is an investment in the form of savings and deposits. The

majority of respondents feel that everyone can get a profitable investment if they do planning and saving/investing. Based on the result, it indicates that the respondent is a risk-averse investor type (risk avoiding). The result was supported by the fact that the type of investor that existed in women workers was short-term investors, so the majority of respondents prefer a period of one-month investments. This is in line with the research (Yuh & Hanna, 1996; Sung, 1997; Bajtelsmit & VanDerhei, 1997; Selvi, 2012, Bahl, 2012, Indrawan, 2014 and Retno, 2014).

Which states that women do not like risk and invest a greater proportion from their portfolios at low risk, lower assets, in this case, are real assets. The third form of investment behavior and preference of the women workers is that the thing encourages women workers to invest is she for the sake of retirement plans and family security reasons. Based on the results of the study, it showed that women workers have high financial literacy. It is indicated by the discipline of investing the excess money, to have control over their finances and have the confidence to earn investment profits, and they must perform financial planning. Considering that this study has a limitation, the suggestion given in generalizing the result is that prudential principles need to be implemented. **First,** the number of respondents is relatively limited; **second,** demographic factors used in this study were limited to age, marital status, education, occupation, and income. In Indonesia, investment behavior is also influenced by other factors, such as tribe and religion. **Third,** this study only focuses on demographic factors and does not include psychological factors. Investment choices and tolerance to risk are also influenced by psychological factors. The result of this study will benefit banking and Investment Company. Banking and Investment Company need to understand the demographical factor of its customers to compile investment products, which is suitable for customers' characteristics.

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Power, IntraTeam Conflicts, Conflict Contagion and its Impact on Performance

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Abstract: The objective of this study is to examine the importance of power, intrateam conflict, conflict contagion and its impact on organizational performance. This study has used past literature to extend work on power, intrateam conflict, conflict contagion and its impact on performance by providing prepositions. The study demonstrates the importance of power and its impact on intrateam conflicts, which form the shape of conflict contagion and ultimately affect performance. Study found that power leads to more conflicts and its process of spreading hastens because of its contagious nature negatively influences the team's performance. The paper has highlighted the untapped element of power and creates a bridge between power, conflict and its impact on organizational performance. Many researchers have focused separately on power, teamwork and conflict. However, still, there is a need to assess whether individual power interests also takes the form of conflict contagion, which might affect performance of the organization.

Keywords: *Power, Intrateam Conflicts, Conflict contagion, Performance*

1. Introduction

In this era, emphasis on team effectiveness is the major area of concern in emerging organizations (Cohen & Bailey, 1997). The concept of teamwork is used in organizing, structuring and allocation of tasks. Teamwork has not only increased performance (Ingram, 1996) but still, there is a need to assess, whether teams with power are effective or otherwise. As, the increasing trend of teamwork approach also poses some issues like conflict, which takes the form of contagion and sometimes affects performance.

Further, in order to create effective teams, it is of utmost importance to understand the relationship of power, intrateam conflict, conflict contagion and its impact on performance (Mannix & Sauer, 2006). Earlier research was carried out with limited scope in seclusion from social problems (Lammers, Dubois, Rucker, & Galinsky, 2013). A lot of literature exists on power and intrateam conflicts at the entity level (Bayazit & Mannix, 2003; Kankanhalli, Tan, & Wei, 2006, de Jong, Schalk, & Curseu, 2008, Stewart & Barrick, 2000). However, yet there is a need to inquire about the relationship between the concept of power and its relationship with intrateam conflict contagion and its impact on performance as this area is quite understudied. Further, there is also a need to focus on which attitudes and behaviors provoke in garnering power, which takes the form of conflict contagion or struggles to achieve power among the teammates and ultimately negatively affects performance.

This qualitative research study extends the existing body of literature in the area in the following ways: Firstly, this study extends the topic of power. Secondly, this research study develops a bridge between the impact of power on the conflict contagion in intrateam context. This area has become a pivotal area of research as mostly conflict arises in teams when people are dependent on others for achieving common goals. Thirdly, it broadens the horizon of power and studies its impact on the performance of the organization. Moreover, the findings of this study have important implications for executives, management and decision makers.

The rest of the paper is organized as follows. Section 2 describes the theoretical framework about power, conflict and its contagious nature and development of prepositions. Section 3 concludes the study and provides future research direction as well.

2. Theoretical Framework

Power: The history reveals that humans have an instinct for status as well as power in their behavior (Frieze & Boneva, 2001). This intuition forces human being for constant struggle (Kipnis, 1976) Earlier literature

provides many definitions of power. Winter (1973) defined power as independent command over the resources, without the dominance of the society. Power was also defined as the dominance of individual in agency context (Winter, 1973). Further, it is also defined as to get the result as per own aspiration (Winter, 1973). Overall, the concept of power is mainly about dominance.

Team Power: Team power is defined in terms of control of resources in entity or society as a whole (L. Greer & van Kleef, 2008). Further, this concept is defined as complete control in the administration of resources as well as punishment (French, Raven, & Cartwright, 1959). The individual behavior of making others realize that they belong to a certain class, also creates dominance culture (Guinote, Brown, & Fiske, 2006). Moreover, the powerful post or position might result in dominance in terms of either respect or status (Anderson & Berdahl, 2002; Guinote, Judd, & Brauer, 2002). Diffusion in a team means a differentiation in the amount of resources held by the team members (Tarakci, Greer, & Groenen, 2016). Further, research has also revealed that polite behavior diminishes as team members get power (Keltner, Young, Heerey, Oemig, & Monarch, 1998). Some teams achieve a high level of power, which sometimes move the team towards negativity and also affect the performance of the team as well as organization. Earlier research also reveals that the probability of conflicts is higher in intragroup powerful teams (Hildreth & Anderson, 2016). Zhao & Greer (2017) also mentioned that powerful team members usually dominate and have quite hostile approach. They try to protect own power by using an aggressive approach, which sometimes makes other feel paranoid.

Conflict: Conflict is the name of struggle among parties who are inter-reliant but have contrary goals, sparse reward and intervention from other bodies in the attainment of goals (Wilmot & Hocker, 2001). In earlier research, most of the researchers have focused on the negative impact of the conflict. Hackman & Morris (1974) elaborated the concept of conflict in terms of its effect on the relationship at the individual as well as at the professional level. Whereas on the other side, the conflict has also a positive impact on the performance of the team. There are different stages when conflict arises, which include accommodation, compromise to a certain extent, solution of issues and sometimes complete avoidance (Deutsch, 1977). Auxiliary to some stages, some severities in conflict include bad voices, howling, shrieking and banging of doors (Jehn, 1997) . Further, conflict can have a negative effect on the innovation, novelty of ideas, performance, decision power and effective communication (De Dreu, 1997). Broadly, Jehn (1995) classified conflicts into two kinds at the intragroup level: task conflict and relationship conflict.

Task Conflict: Task conflict is defined as divergence of opinion among individuals on decisions. Main areas include difference of opinion on resources, processes and procedures, analysis and representation of results. On the one side, earlier research in student teams working on different tasks showed that members having high power performance was relatively worse than members having low power (Zhao & Greer, 2017). Whereas, on the contrary, task conflict has a positive association with emergence of creativity and innovation (West & Anderson, 1996), the occurrence of healthy debate on various issues (Jehn, Northcraft, & Neale, 1999) and acceptability of group decisions (Amason, 1996).

Relationship Conflict: Relationship conflict arises due to incongruity among the persons and it leads to loathing. It includes divergence of opinion based on a value system, adherence of norms or difference on tastes on various aspects. Normally, relationship conflict has a negative impact on employees satisfaction level (De Dreu & Van Vianen, 2001), which ultimately results in a reduction in an overall efficiency of the team (Jehn, 1997).

Process Conflict: Process conflict is a difference of opinion on the usage of strategy for attainment of the goal (Jehn & Mannix, 2001). Further, process conflict arises when group members have a disagreement on tasking and distribution of assignments. Process conflict affects morale as well as performance and output (Jehn, 1997; Jehn et al., 1999).

Conflict Contagion: One of the major drawbacks of the team is interdependence, which increases the likely hood of conflict contagion process (Lewin, 1948). Further, this interdependent adds fuel to the conflict contagion. In teams, conflicts may spread from just a few to all team members over time, which might aggravate and spread aggressively and takes the shape of conflict contagion. Lau & Murnighan (1998) hypothesized that sub groupings might form on the basis of demographic characteristics. Further,

demographic influence on the team may also increase the intensity of coalition formation in a team, which might hasten conflict and takes the shape of dyadic conflict. We propose the following mechanisms for conflict contagion:-

Coalition Formation: The first primary mechanism we suggest is coalition formation. We believe that underlying reasons for coalition formation are preceding relationships and conflicts. The intensity of coalition formation is also based on access to resources. Further, members who are particularly close to members directly engaged in the start of conflict may feel that they should support them. Further, research has also revealed that team members always customize their behavior with members having socially same background (Crano & Cooper, 1973).

Emotional Contagion: Second primary mechanism we propose is emotional contagion. We suggest that emotional contagion is a situation when team members get involved in conflicts in which they were not originally engaged; which might be due to the spread of negativity. Further, these negative emotions might be the source of emotional contagion (Bodtker & Katz Jameson, 2001). Further, conflicts take place due to perceived incompatibilities, which affects the outcome (Roseman, 1996; Bell & Song, 2005). They include disappointment, dislike and annoyance (Guetzkow & Gyr, 1954; Russell, 1978). Negative emotions also affect other team members and take the shape of emotional contagion (Barsade, 2002; Kelly & Barsade, 2001), which also aggravate the situation and ultimately affect the performance.

Defense of own and Team Interests: Lastly, the third primary mechanism we propose is the member's defense of their own and team vested interests. When conflict arises in a team and individuals are forced to show their self-defense and take certain measures. In the following sections, we will explain in detail how each of these mechanisms of conflict contagion can take place and the factors which can exacerbate or ameliorate the speed and extent to which they may contribute to conflict contagion and its outcomes.

Linkage between Team Power and Intrateam Conflict: The most widely used definition for construct of power is control over the resources (Blau, 1964). Further, power is also defined in terms of control over the behaviors as well as outcomes (Keltner, Gruenfeld, & Anderson, 2003). It is generally perceived that teams with high power, function relatively better due to their wide exposure and knowledge base (Lazear & Rosen, 1979). But on other side, it is also suspected that high-power teams may perform worse as compared to low-power teams due to conflicts (De Dreu & Weingart, 2003).

Linkage between team power and performance: An important determinant of team performance is openness, which not only affects productivity, cooperation and performance. Further, team power has some damaging effects on team performance, which includes a reduction in communication among the teammates. Mainly, in team setting power affects performance in two ways. Firstly, in psychological context power leads among individuals influence their attitudes and opinions in group settings (Berdahl & Martorana, 2006; Anderson & Berdahl, 2002; Berdahl & Martorana, 2006). Secondly, individuals who come in power undervalue the viewpoint and judgment of other members (Berdahl & Martorana, 2006). This type of dominating behavior has a devastating impact on the performance. We, therefore, expect that leaders with a highly skewed sense of power have dominating team interactions. Thus, we predict and propose the following:

Proposition 1: High-power teams have higher levels of conflict (task, process, relationship) than low-power teams and impact performance.

Based on existing literature (De Dreu, 2008), it is further suggested that various nature of conflicts negatively affects team performance. Further, the theoretical mechanisms addressing this area shows that conflicts may create distractions and ultimately affect the attainment of goals, which ultimately decrease the productivity of the team and efficiency of the system (Evan, 1965, Jehn & Bendersky, 2003). These incompatibilities increase conflict, which creates negative emotions including annoyance, dislike and rage (Bell & Song, 2005). These conflicts can badly affect the cognitive ability of team members (Brief & Weiss, 2002).

Keeping in view the discussion above, it is proposed that high power teams are prone to various nature of conflicts including task, process and relationship conflicts as compared to lower power teams, because of rivalry between teammates for attainment of power (Chattopadhyay, Finn, & Ashkanasy, 2010, Greer & van Kleef, 2010). Further, individuals who have an appetite for high power teams may come across many hindrances. Earlier research reveals that tense power dynamic in high-power teams in high-level teams is especially receptive to imbalance pertaining to power, perks and prestige (Greer & van Kleef, 2010; Siegel & Hambrick, 2005). Further, high power members also become aggressive, dominating and rude when dealing with the teammates (Morrison, Fast, & Ybarra, 2009, Chattopadhyay, Finn, & Ashkanasy, 2010). Moreover, research has also revealed that persons in powerful team are not only harsh, but are more vulnerable to conflict (Smith, Jost, & Vijay, 2008). Therefore, negativity and conflict aggravate, especially in high power teams. Consequently, strive for attaining power increases the likelihood of conflict including task, process and relationship conflict. Therefore, based on above theoretical mechanisms we propose that conflict and team performance will be negatively related.

Proposition 2: Conflict Contagion spread and involves other team members and has a negative impact on the team performance

Teams having tendency of conflict might result in affecting the performance. Focus on main goal decreases when conflict takes the form of conflict contagion and spread around (Kelly & Barsade, 2001). Conflict widens the communication gaps, which is also a contributor in affecting performance (Baron, 1991) and it increases animosity level (Friedman, Tidd, Currall, & Tsai, 2000). Conflict may proceed either in linear way or else take the form of riot (Gersick, 1988). Conflict contagion might increase the division among the team (Li and Hambrick, 2005; Molleman, 2005, Hogg et al., 1990), give rise to inter-subgroup competition (Lau and Murnighan, 1998), and behavioral collapse (Li and Hambrick, 2005). Such type of negative conflict contagion may detract members from the goal and ultimately affect team performance. The competition among the polarized team may take precedence over the likely advantage of the conflict. The competitive relations among teammates results in the maltreatment like bullying of other team members results in affecting performance (Boswell and Olson-Buchanan, 2004).

3. Conclusion

This study demonstrates the importance of power, intrateam conflicts, conflict contagion and their impact on performance. We have highlighted the untapped element of power from conflict0000s and its impact on organization. We have found that power leads to more conflicts and its process of spreading hastens because of its contagious nature and it negatively influences the performance of the teams. The findings show that intensity of conflict is higher in high power teams. Further, conflict contagion spread over and negatively affects the performance of the team as a whole.

Based on these results, some timely steps should be taken with a view to improve conflict management in teams. Moreover, the most important thing is diagnosis of conflict, so that timely remedial measure can be taken to handle the situation. Secondly, management should involve members in open discussions of issues, by also observing the limits, to increase the acceptance level of decisions among the members and to reduce conflicts. Further, management should take measures to mitigate conflicts as soon as possible. Thirdly, extraordinary attention should be given to the stage of conflict because of its interactive effects on performance and contagious process of spreading. The findings of this study extend the existing body of literature on 0the conflict by creating a bridge between conflict, power and its contagion effect on performance. This research work builds on emerging and sweltering body of research area and moves it from conventional approach of exploring individual topics to extended variables in the area.

Future Research: Future research could be undertaken by examining the factors accelerating the conflict contagion. Further, future research can also tap factors increasing the momentum of conflict contagion and how it can be prevented.

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Assessing Working Capital Management and Performance of Listed Manufacturing Firms: Nigeria Evidence

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Abstract: This study assessed working capital management and performance of listed manufacturing firms in Nigeria 20 firms were sampled, over 10 years. The study employed static data analyses and panel Granger causality test. Result showed that average collection period exerts insignificant negative effect on return on capital employed of the sampled firms, while average collection period also exerts insignificant negative effect on earnings per share of the sampled firms. The result further showed that, average payment period exerts insignificant positive effect on return on capital employed of the sampled firms, but average payment period exerts insignificant negative effect on earnings per share of the sampled firms. The study concluded that, average collection period and average payment exert insignificant effect on return on capital employed of listed manufacturing firms in Nigeria, also; average collection period and average payment period exert insignificant effect on earnings per share of listed manufacturing firms in Nigeria. Hence manufacturing firms in Nigeria should objectively manage average collection period and also maintain a consistent improvement in return on capital employed and earnings per share of listed manufacturing firms in Nigeria.

Keywords: *Working Capital Management, Performance, Average Collection Period, Average Payment Period.*

1. Introduction

Working capital is one major factor upon which stability and survival of a business entity depend. Funds are regarded as the capital needed to start, support a business or as accumulated wealth of a business, which is represented as the assets less liabilities and it is also seen as stock or ownership in a company. Therefore, working capital is the fund used for the daily running of a business. In other words, it is the resources that are liquid in nature which are needed by a business entity to sustain stable cash flow. According Cyert & March (1963), for a firm to achieve economic success, the firm's resources should be utilized efficiently. Working capital management is sustaining an adequate level of working capital, which is meant for short-term period. Also, working capital management is sustaining adequate liquidity for business survival in short-term period. Niresh (2012) opined that working capital management is important in determining firm's performance. Consequently, working capital management is maintaining sufficient cash flow level to manage its liabilities, which is done in the best interest of shareholders. Working capital management enhances a company's financial position and assist in having a better understanding of how well working capital is performing. Several studies had been conducted on assessing working capital management and performance of listed manufacturing firms across countries over time, observably previous studies measured performance using return on asset, return on equity, gross operating profit and net operating profit.

While working capital management was measured using average collection period, average payment period and these studies revealed that, working capital management exerts significant negative effect on firm's performance, while others revealed insignificant negative effect and examples of these studies are; Lazaridies & Tryfonidis, 2006; Gill, Biger & Mathur, 2010; Alipour 2011; Vahid, Elham, Mohsen & Mohammadreza 2012; Ahmadabadi, Mehrabi & Yazdi 2013; Senthilmani, 2013; Caballero, Teruel & Solano 2014; Enqvist, Graham & Nikkinen 2014; Maria & Paulo, 2015; Li, 2016. However, other previous studies that proxy performance by return on capital employed and earnings per share revealed that, working capital management exerts significant positive effect on performance, examples of such studies are; Mohammad, 2011; Alavinasab & Davoudi, 2013; Nduta, 2015; Eya, 2016; Madugba & Ogbonnaya, 2016. Given the divergence in the result of previous studies, this study analyzed the effect of working capital management variables (average collection period and average payment period) on firm's performance measured by return on capital employed and earning per share. In addition, this study observed that little or no attention was given by previous researchers to the direction of causality of working capital management and performance and no consideration was given to heterogeneity effect across firms in the discourse of working capital management and performance, therefore, this study sampled firms across.

Sub-sectors of the manufacturing sector and incorporated measures of heterogeneity effect in the analysis, through the use of Least Square Dummy Variable (LSDV) and also employed panel based Granger causality test to track the direction of causality of working capital management and firm's performance. Specifically, this study analyzed:

- Effect of average collection period and average payment period on return on capital employed of listed manufacturing firms in Nigeria.
- Effect of average collection period and average payment period on earnings per share of listed manufacturing firms in Nigeria.
- The direction of causality of working capital variables and performance variables of listed manufacturing firms in Nigeria.

2. Literature Review

Working Capital Management: Working capital management is the management of current assets and current liabilities of an organization, interrelationship between them as they affect performance and firm's value (Sunday, Abiola & Lawrencia, 2012). For a business to be operational, it needs liquid assets which will sustain cash flow, pay wages, salaries, and creditors so as to maintain a functional workforce and sustain regular suppliers. An inefficient Management of components of working capital management (average account receivables, average account payables, and inventories) will cause difficulties for firm's continuing operation and reduction in firm's market value (Yang, 2006).

Firm's Performance: Firm 's performance is how well the firm's overall target have been accomplished Eshna (2017). Firm's performance is a how well a firm has been able to achieve its goals at a specified period. According to Nduta (2015), firm's performance is creating revenue for owners of business from the assets of such business. Firm's performance is used by management of firms to evaluate both the profitability and financial position of the organization. According to Haruna (2016), to properly assess the effect of working capital management on firm's performance, one should carry out such test, by proxy performance using return on asset (ROA), return on equity (ROE), and as well as return on capital employed (ROCE); so as to show clearly, some performance indicators of a firm.

Empirical Review: Lazaridis and Tryfonidis (2006) examined the relationship between working capital management and profitability of firms listed in Athens Stock Exchange. Researchers measured performance using gross operating profit, while working capital management was proxy by accounts receivable days, accounts payable days and days in inventory; data were analyzed using correlation and regression analysis. The result revealed that, there exist statistical relationship between working capital management and the firm's profitability. Researchers concluded that there exists a relationship between working capital management and profitability. Alipour (2011), studied working capital management and corporate profitability of firms listed in Tehran stock exchange. Multiple regression and Pearson correlation was used to analyze data and result revealed that, there exist statistical relationship between working capital management and profitability. Vahid, Elham, Mohsen, Mohammadreza (2012), examined the effect of working capital management on performance of firms listed in Tehran stock exchange. Multiple regression analysis was used to analyze data and result revealed that, working capital management exerts significant effect on firm's performance. Enqvist, Graham and Nikkinen (2014), studied the impact of working capital management on firm profitability in Finland.

Researchers measured working capital management using accounts receivable days, accounts payable days, and days in inventory, while profitability was proxy by return on assets (ROA). Researchers used regression analysis to analyze data and the result revealed that, working capital management exerts significant effect on profitability. Ikpefan, Owolabi, Agwu and Adetula (2014), studied working capital management and profitability of the manufacturing sector in Nigeria. Researchers used correlation and regression analysis to analyze data and result revealed that, working capital management exerts significant effect on profitability. Also, result further revealed existence of unidirectional causality between earnings per share and average collection period, as well as unidirectional causality between earnings per share and average payment period. Hence, the study established a unidirectional causality between performance of listed manufacturing firms and their working capital management. Ogbuji and Ogunyomi (2014) examined working capital management

policy and financial performance in the Nigerian foods and beverages industry. Descriptive analysis, accounting ratios and Pearson correlation analysis were used to analyze data and result revealed that, there exist statistical relationship between working capital management policy and financial performance.

3. Methodology

This study adapted the model used by Madugba and Ogbonnaya (2016), to examined working capital management and financial performance of manufacturing companies in Nigeria. Researchers measured financial performance using earnings per share and return on capital employed, while working capital was proxy by average payment period and average collection period. The model is specified below for simplicity

$$Y_t = \delta_0 + \delta_1 ACP_{it} + \delta_1 APP_{it} + \mu_{it} ----------(3.1)$$

Where the dependent variables in the model used by Madugba and Ogbonnaya are earnings per share (EPS) and return on capital employed (ROCE), while average collection period (ACP), and average payment period (APP) are independent variables of the model used by Madugba and Ogbonnaya; and the model was modified in this study, to capture average collection period, average payment period, which were used as proxy for working capital management alongside asset tangibility (ATANG) and firm size (FZ) which are control variables of this study (independent variables). While return on capital employed and earnings per share were used to measure performance (Dependent Variables). For simplicity the models (Model 1 and Model 2) are expressed in functional and linear forms below:

Functional and Linear Forms Below: ROCE=f (ACP, APP, FZ, ATANG)**,** EPS=f (ACP, APP, FZ, ATANG)
Linear Representation of the Models:

$$ROCE_{it} = \delta_0 + \delta_1 ACP_{it} + \delta_2 APP_{it} + \delta_3 FZ_{it} + \delta_4 ATANG_{it} + \mu_{it} ----(3.2)$$

$$EPS_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_2 APP_{it} + \beta_3 FZ_{it} + \beta_4 ATANG_{it} + \mu_{it} ----(3.3)$$

Source(s) of Data and Method of Analysis
This study sample twenty (20) manufacturing firms across sub-sectors of the manufacturing sector in Nigeria. Data were sourced from financial report of firms sampled, for 10 years period (2008-2017). Study made used of correlation matrix, static data analyses (pooled OLS estimator, fixed effect estimator, and random effect estimator), alongside post estimation tests (Restricted F test, Durbin-Wu-Hausman test) and Dumitrescu-Hurlin panel granger causality test.

Analytical Framework: Purposive sampling technique was used to identify study area (Palys, 2008). The models used in this study, were meant to show that the independent variables can cause a change (effect) in the dependent variables, also to test the significance of the population variance (Kothari 2004) and as well as to evaluate the relationship among variables, with significance of beta value at 5% was interpreted using the probability values (P-value).

4. Data Analysis and Interpretation

Table 1: Pooled OLS Estimations

Variables	ROCE Coefficients (Estimation value)	Probability (P value)	EPS Coefficients (Estimation value)	Probability (P value)
C	99.38923	0.000	-21.13508	0.000
ACP	-.0444249	0.216	-.041477	0.004
APP	-.0224948	0.259	-.008617	0.274
FZ	-3.807852	0.000	1.680325	0.000
ATANG	8.5457	0.327	0.3065035	0.929
	R-squared =0.4235		R-squared =0.4766	
	Adjusted R-squared=0.4056		Adjusted R-squared=0.4597	
	F-statistics=6.87		F-statistics=10.46	
	Probability(F-statistics) = 0.0000		Probability(F-statistics)= 0.0000	

Source: Authors Computation, (2019)

Estimation result presented in table 1, showed the effect of average collection period (ACP) and average payment period (APP) on return on capital employed (ROCE) and earnings per share (EPS) when observation across sampled firms was pooled without consideration of their heterogeneity effects. The result of this estimation shows that, both average collection period and average payment period exert insignificant negative effect on return on capital employed with an estimation value of -0.0444249(P value=0.216 > 0.05) and -0.0224948(P value=0.259 > 0.05) respectively. Result of this estimation also showed that, average collection period exerts a significant negative effect on earnings per share, with an estimation value of -0.041477 (P value=0.004 < 0.05), while average payment period exerts an insignificant negative effect on earnings per share, with an estimation value of -0.008617 (P value=0.274 > 0.05). Reported R-squared is 0.4235 and 0.4766 respectively for both models used in this study, and this shows that, there is about 42% and 48% systematic variation in return on capital employed and earnings per share respectively of the sampled manufacturing firms, which is explained by the explanatory variables (average collection period, average payment period, asset tangibility and firm size); when no consideration is given to cross-sectional or period effects.

Table 2: Fixed Effect Estimations

Variables	ROCE Coefficients (Estimation value)	Probability (P value)	EPS Coefficients (Estimation)	Probability (P value)
C	180.4804	0.000	58.71622	0.005
ACP	.0078454	0.28	-.0024489	0.870
APP	.0102493	0.70	-.0076449	0.327
FZ	-7.095749	0.00	-2.872724	0.010
ATANG	-7.432455	-0.74	-11.24968	0.034
Fixed Effect				
PZ	-42.21667	0.000	-1.430739	0.686
GUINNESS	-9.17294	0.171	9.886159	0.006
NB	-4.463051	0.544	9.508754	0.015
DANGSUGAR	-18.0346	0.012	-.7566144	0.840
NASCON	-14.03938	0.083	-4.963783	0.245
DANGFLOUR	-30.88227	0.000	-.839452	0.808
FLOURMILLS	-33.18293	0.000	1.586439	0.668
NESTLE	-1.749751	0.784	21.22949	0.000
VITAFOAM	-34.09788	0.000	-7.896129	0.071
CUTIX	-41.23653	0.000	-11.66833	0.044
MEYER	10.7776	0.210	-8.180624	0.072
WAPCO	-29.15247	0.000	7.831068	0.038
BERGER	-17.49774	0.053	-9.463424	0.047
FIRSTALUM	-61.65237	0.000	-5.30343	0.166
PORTPAINT	-4.953228	0.637	-12.89268	0.021
BETAGLAS	-45.35556	0.000	-2.813093	0.495
PREMPAINT	-57.83856	0.000	-13.52165	0.033
PAINTCOM	-58.25469	0.000	-14.63453	0.016
DANGCEM	-9.069566	0.298	33.32579	0.000
R-squared =0.7135			R-squared =0.5191	
Adjusted R-squared=0.6760			Adjusted R-squared=0.4563	
F-statistics=19.05			F-statistics=8.26	
Probability(F-statistics)=0.0000			Probability(F-statistics)= 0.0000	

Source: Authors Computation, (2019)

From table 2, fixed effect estimations (where heterogeneity effect across manufacturing firms sampled, is incorporated into the models in form of intercept term), shows that, average collection period and average payment period exert insignificant positive effect on return on capital employed with an estimation value of 0.0078454 (P value=0.28 > 0.05) and 0.0102493 (P value=0.70 > 0.05) respectively. While average collection period and average payment period exert insignificant negative effect on earnings per share with an

estimation value of -0.00244S89 (P value=0.870>0.05), and -0.0076449 (P value=0.327 > 0.05) respectively. Reported R-squared is 0.7135 and 0.5191 respectively for both models used in the study and this shows 71% and 52% systematic variation in return on capital employed and earnings per share respectively, which is explained by the explanatory variables (average collection period, average payment period, asset tangibility and firm size); when consideration is given to cross-sectional or period effects.

Table 3: Random Effect Estimation

Variables	ROCE Coefficients (Estimation value)	Probability (P value)	EPS Coefficients (Estimation value)	Probability (P value)
C	123.6965	0.000	-6.03388	0.551
ACP	-.0012929	0.963	-.0201144	0.164
APP	.0069463	0.632	-.0094842	0.218
FZ	-5.30036	0.001	.7943013	0.164
ATANG	-2.212385	0.809	-2.858026	0.519
	R-squared =0.6643		R-squared =0.6570	
	Wald chi2=13.05		Wald chi2=15.13	
	Probability(chi2)= 0.0110		Probability(chi2)=0.0045	

Source: Authors Computation, (2019)

Table 3, Random effect estimation result (when heterogeneity effect across manufacturing firms sampled in the study and overtime period covered was incorporated into the model via the error term), showed that; average collection period exerts insignificant negative effect on return on capital employed, with an estimation value of -0.0012929 (P value=0.963 >0.05) and average payment period exerts insignificant positive effect on return on capital employed with an estimation value of 0.0069463 (P value=0.632 > 0.05). While average collection period and average payment period exert insignificant negative effect on earnings per share with an estimation value of -.0201144 (P value=0.164 >0.05) and -.0094842(P value=0.218 > 0.05) respectively. Reported R-squared is 0.6643 and 0.6570 for both models used in the study, with 66% and 66% systematic variation in return on capital employed and earnings per share respectively; which is explained by explanatory variables (average collection period, average payment period asset tangibility and firm size); when heterogeneity effect is subsumed into the error term.

Post Estimation Test

Table 4: Restricted F Test (Heterogeneity Effect)

	F-statistics	Probability (P value)
Model 1	19.07	0.0000
Model 2	6.60	0.0000

Source: Authors Computation, (2019)

Table 5: Durbin-Wu-Hausman Test

	Chi-square statistics	Probability (P value)
Model 1	2.99	0.5587
Model 2	8.78	0.0669

Source: Authors Computation, (2019)

Post estimation test result shown in table 4 (Restricted F test) shows the justification for incorporating heterogeneity effect in form of intercept term into the models (Model 1 and Model 2), with a statistical significance of 19.07 (P value=0.0000 < 0.05) and 6.60 (P value=0.0000 < 0.05) respectively. Durbin-Wu-Hausman test result shown in table 5 revealed that, there is not sufficient evidence available to reject the null hypothesis at 56% (P value=0.5587 > 0.05) and 7% (0.0669 > 0.05) confidence level for the models and this

means that, the most consistent and efficient estimator for model 1 and model 2 is the random effect estimator.

Table 6: Dumitrescu-Hurlin Panel Granger Causality Test Result

Null hypothesis	Wbar Statistics (Wald Statistics)	Zbar tilde Statistics	Probability (P value)
ACP does not granger-causes ROCE	1.5446	1.7223	0.0850
ROCE does not granger-causes ACP	2.2969*	4.1011*	0.0000
APP does not granger-causes ROCE	1.1987	0.6285	0.5297
ROCE does not granger-causes APP	1.5057	1.5991	0.1098
Null hypothesis	**Wbar Statistics (Wald statistics)**	**Zbar tilde Statistics**	**Probability (P value)**
ACP does not granger-causes EPS	0.8490	-0.4773	0.6331
EPS does not granger-causes ACP	2.6070*	5.0817*	0.0000
APP does not granger-causes EPS	1.5701	1.8030	0.0714
EPS does not granger-causes APP	2.0176*	3.2178*	0.0013

Note: * connote rejection of the null hypothesis at 5% significance level
Source: Authors Computation, (2019)

Dumitrescu-Hurlin panel granger causality test result shown in table 6, shows that, there is sufficient evidence to reject the null hypothesis, which states that; return on capital employed does not granger-causes average collection period, which means that, there is the existence of unidirectional causality between return on capital employed and average collection period. Result also showed that there is sufficient evidence to reject the null hypotheses which state that, earnings per share does not granger-causes average collection period and also, earnings per share does not granger-causes average payment period. This is to say that, there is the existence of unidirectional causality between earnings per share and average collection period as well as unidirectional causality between earnings per share and average payment period.

Discussion: Based on the random effect estimation result, average collection period exerts an insignificant negative effect on return on capital employed, with estimation value of -0.0012929 (P value=0.963 >0.05). The result revealed that, reduction in average collection period by one day will culminate into about 0.001% increase in return on capital employed of manufacturing firms sampled in the study. Also, average payment period exerts an insignificant positive effect on return on capital employed, with estimation value of 0.0069463 (P value=0.632 > 0.05). This means that, increase in average payment period by one day will culminate into about by 0.007% increase in return on capital employed of manufacturing firms sampled in the study. It also revealed that, average collection period exerts insignificant negative effect on earnings per share, with estimation value of -0.0201144 (P value=0.164 >0.05), which means that every one day reduction in average collection period will culminate into about 0.02 naira (2 kobos) increase in earnings per share and average payment period exerts insignificant effect on earnings per share, with estimation value of -0.0094842 (P value=0.218 > 0.05), which means that, for every one day increase in average payment period, earnings per share will decline insignificantly by 0.009 nairas (less than 1 kobo).

Also result of Dumitrescu-Hurlin panel granger causality test revealed existence of unidirectional causality between return on capital employed and average collection period, which means that, previous level of return on capital employed, exerts significant effect on the current average collection period of manufacturing firms sampled in the study. Also, the result further revealed existence of unidirectional causality between earnings per share and average collection period, as well as unidirectional causality between earnings per share and average payment period. Hence, the study established a unidirectional causality between performance of quoted manufacturing firms and their working capital management. Observably, findings made in this study are in congruence with findings of previous researchers, who in the study of working capital management and performance, revealed that, there is no statistical significant relationship between working capital management variables (average collection period and average payment period) and performance. Examples

of such studies are Gill et al. (2010), Vahid et al. (2012), Ahmadabadi et al. (2013), Nyabenga (2014) and Mbawuni et al. (2016). While other previous researchers like Madugba and Ogbonnaya (2016), revealed that, average collection period exerts negative effect on both return on capital employed and earnings per share of manufacturing firms and this, is also in congruence with the findings of this study.

5. Conclusion and Recommendations

Result revealed that, managing working capital through average collection period can mildly improve firm's performance, when firm's performance is proxy by return on capital employed and earnings per share. While, managing working capital through average payment period has an infinitesimal negative effect on firm's performance which is proxy by earnings per share and return on capital employed. This study also established existence of unidirectional causality between performance of listed manufacturing firms and working capital management, so manufacturing firms in Nigeria should objectively reduce the number of average collection period in a bit to manage working capital needed for effective and efficient firm's operation because such reduction contributes to improved performance, which is proxy by return on capital employed and earnings per share. Also, they should consistently maintain an improved performance (return on capital employed and earnings per share) so as to position the organization for better working capital management in the subsequent years, given the existence of unidirectional causality between performance variables and working capital management variables.

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Excel Based Financial Modeling for Making Portfolio Management Decisions

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Abstract: The Excel based financial model proposed in this paper provides a very simple but powerful method for portfolio selection. Apart from a simple and powerful tool for making portfolio management decisions, the paper also proposes an easy to use technique for calculating portfolio standard deviation without using correlation coefficients. The model uses "Excel Solver Add-In" to create an optimum portfolio by maximizing the Sharpe ratio. Benefits of Sharpe style optimization are demonstrated using data on monthly returns from 1999 to 2010 covering 30 stocks.

Keywords: *Portfolio optimization, Sharpe ratio, portfolio standard deviation, financial model.*

1. Introduction

Investors, fund managers and financial analysts buy securities from capital markets and stock markets in order to create an investment portfolio. Securities which they buy can be either debt type instrument such as bonds issued by government entities (example Central Bank of Oman development bonds) and private companies, or equity type instruments – primarily shares sold in stock markets such as the Muscat Securities Market (MSM). Debt instruments such as bonds earn a fixed annual interest, but the price at which they are traded in the markets may vary according to a variety of factors, and therefore capital gains and losses are possible. Since the extent of price fluctuation is less, bonds (and debt instruments) can be classified as low risk securities. On the other hand, the prices of shares can vary a lot depending on expectations regarding firm performance, industry performance and general economic environment. Compared to debt instruments, risk of equity instruments is higher. Risk related to capital market securities such as shares and bonds is measured using standard deviation of historical returns. The higher the standard deviation higher is the risk in including a particular security in the portfolio of assets held by an investor or an institution.

Modern portfolio theory says that portfolio risk is not the sum total of the risk of each individual security included in the portfolio. Markowitz in his seminal study shows that when two securities with negative correlation are included in a two asset portfolio, the risk of the portfolio is less the than the sum of the individual risks, because returns on these two assets tend to move in the opposite direction over time and therefore loss due to one security is set of by gain in the other security. Modern portfolio theory therefore proposes that while poorly correlated. The principle of diversification, one the main tenets of modern portfolio theory, shows that diversification is useful only when the securities included in the portfolio have low positive or preferably negative correlations. Diversification yields no benefits when securities included in the portfolio have perfect positive correlation. Further past empirical research shows that as the number securities included in the portfolio keep increasing the standard deviation of the portfolio keeps on declining, but the benefits of diversification disappear (or are greatly reduced) when the number of stocks in the portfolio goes beyond thirty.

Estimation Problems and Excel Based Solution: "The number of correlation estimates can be significant – for example, for a portfolio of 100 securities, the number is 4,950" (Reilly & Brown, 2006, pp. 239). Combining all these correlations using the portfolio variance formula given in Table 1 can be tedious, time consuming and can result in estimation risk. An innovative approach to estimating portfolio standard deviation (and portfolio variance) is suggested in this paper, and, is one of the two important contributions this paper. This paper suggests a Microsoft Excel based financial model which can be used for estimating portfolio standard deviation. The model is very powerful to the extent it can be easily extended to include any number of securities in the portfolio. The Excel based model was tested with 30 securities, to calculate portfolio standard deviation and to create an optimum portfolio by minimizing the Sharpe ratio – that is the ratio of portfolio excess returns divided by portfolio standard deviation. The final result of the portfolio selection process is to arrive at weights to be attached to each security. The weights show the percentage of

funds to be invested in each security. If the weight arrived in the portfolio selection process is zero, this implies that the security should be dropped from the portfolio. The equations which are used in calculating the return and risk of a portfolio of securities are shown in Table 1 given below.

Table 1

- Expected return:

$$E(R_p) = \sum_i w_i E(R_i)$$

where R_p is the return on the portfolio, R_i is the return on asset *i* and w_i is the weighting of component asset i (that is, the proportion of asset "i" in the portfolio).

- Portfolio return variance:

$$\sigma_p^2 = \sum_i w_i^2 \sigma_i^2 + \sum_i \sum_{j \neq i} w_i w_j \sigma_i \sigma_j \rho_{ij},$$

where ρ_{ij} is the correlation coefficient between the returns on assets *i* and *j*. Alternatively the expression can be written as:

$$\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij},$$

where $\rho_{ij} = 1$ for *i=j*.

- Portfolio return volatility (standard deviation):

$$\sigma_p = \sqrt{\sigma_p^2}$$

For a **two asset** portfolio:

- Portfolio return: $E(R_p) = w_A E(R_A) + w_B E(R_B) = w_A E(R_A) + (1 - w_A) E(R_B).$
- Portfolio variance: $\sigma_p^2 = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2 w_A w_B \sigma_A \sigma_B \rho_{AB}$

For a **three asset** portfolio:

- Portfolio return: $E(R_p) = w_A E(R_A) + w_B E(R_B) + w_C E(R_C)$
- Portfolio variance: $\sigma_p^2 = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + w_C^2 \sigma_C^2 + 2 w_A w_B \sigma_A \sigma_B \rho_{AB} + 2 w_A w_C \sigma_A \sigma_C \rho_{AC} + 2 w_B w_C \sigma_B \sigma_C \rho_{BC}$

Source: https://en.wikipedia.org/wiki/Modern_portfolio_theory

As shown in the above table calculating the portfolio return is fairly straight forward as it is just the weighted average of the returns on each individual security included in the portfolio. This formula can be easily estimated even if the portfolio has a large number of securities. However, portfolio standard deviation is not

just the weighted average of the standard deviations of individual securities, nor is the portfolio variance a simple weighted average of variances of individual securities. To calculate portfolio standard deviation or portfolio variance it is necessary to include the pairwise correlations of all securities included in the portfolio. As shown in Table 1 for a two asset portfolio only one pairwise correlation (viz., correlation between security A and security B) is required. However, for a three asset portfolio consisting of three securities (A, B and C) three correlation coefficients are required, and for a four asset portfolio the number of correlations required are 6 and so on. The number of correlations required keeps increasing exponentially posing an estimation problem.

Table 2: Estimating Portfolio Standard Deviation without using Correlation Coefficients

	B	C	D	E	F	G	H	I	J
2			Returns						
3	**Date**	**Market Index**	**AA**	**BB**	**CC**	**Risk-free rate**			**Portfolio Weights**
4	1/12/2000	-3.1%	-6.3%	2.5%	18.7%	7.9%			
5	1/12/2001	30.5%	31.9%	14.5%	24.7%	6.6%		AA	59.6%
6	1/12/2002	7.6%	4.6%	16.9%	19.9%	4.2%		BB	0.0%
7	1/12/2003	10.1%	6.1%	-15.9%	-9.1%	3.5%		CC	40.4%
8	1/12/2004	1.3%	20.1%	6.5%	0.3%	3.5%			100.0%
9	1/12/2005	37.6%	28.7%	39.8%	69.2%	7.1%			
10	1/12/2006	23.0%	38.3%	11.6%	17.8%	5.1%		constraint	100.0%
11	1/12/2007	33.4%	30.3%	45.9%	5.5%	5.6%			
12	1/12/2008	28.6%	-9.8%	14.1%	12.8%	5.2%			
13	1/12/2009	21.0%	26.9%	-27.4%	22.3%	4.5%			
14									
15	**Date**	Portfolio Returns	Portfolio Excess Returns						
16	1/12/2000	3.8%	-4.1%						
17	1/12/2001	29.0%	22.3%						
18	1/12/2002	10.8%	6.6%						
19	1/12/2003	0.0%	-3.5%						
20	1/12/2004	12.1%	8.6%						
21	1/12/2005	45.0%	38.0%						
22	1/12/2006	30.0%	24.9%						
23	1/12/2007	20.3%	14.7%						
24	1/12/2008	-0.6%	-5.9%						
25	1/12/2009	25.0%	20.5%						
26	Portfolio Return	17.54%	12.21%		Sharpe Return to Risk Ratio	**0.86**			
27	Standard Deviation of the Portfolio	14.17%							

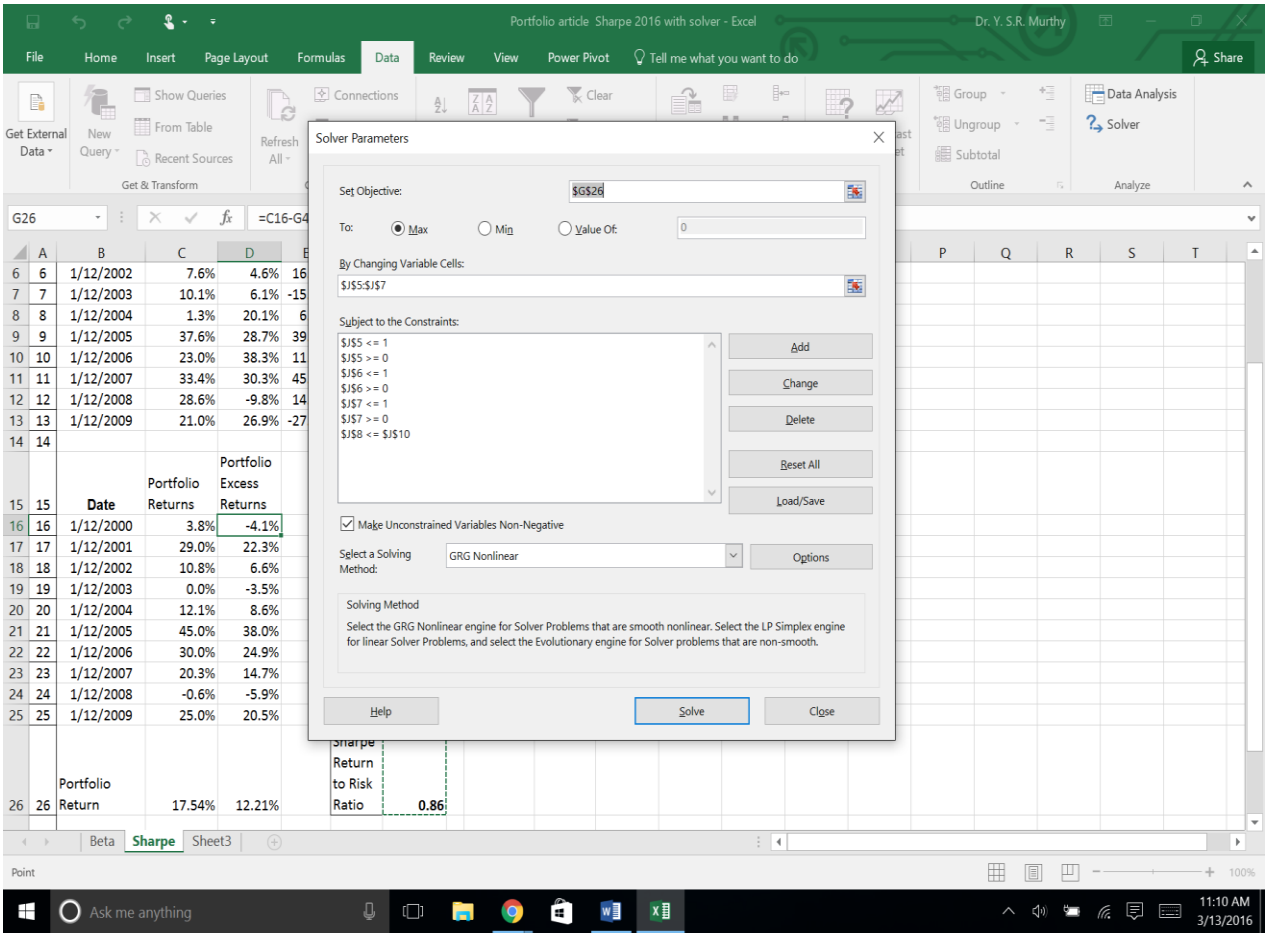
2. Estimating Portfolio Standard Deviation without Correlation Coefficients

As mentioned earlier estimating portfolio standard deviation is fraught with difficulties when there are large numbers of securities in the portfolio. In this section a simple method of estimating portfolio return is presented. The first step of the estimation is to calculate the portfolio return for each period. As shown in Table 2 above, the portfolio returns for each year from year 2000 to year 2009 has been calculated (cells C16 to C25). The formula used for estimating portfolio return for each year is the weighted average of the returns of individual securities (specifically with reference to Excel sheet in Table 2 the formula is "=$J$5*D4+$J$6*E4+$J$7*F4"). The second step is to calculate portfolio returns for the whole period (year 2000 to year 2009) by taking the average of each year portfolio returns (specifically with reference to the Excel sheet in Table2 the formula used is "=AVERAGE (C16:C25)"). The next step is calculating portfolio standard deviation, which can be done by calculating standard deviation of portfolio returns of each year (specifically with reference to the Excel sheet in Table 2 the formula used is "=STDEV.P(C16:C25)"). Portfolio standard deviation obtained through this method is exactly the same as the portfolio standard deviation calculated by using the pairwise correlation coefficients. However, as demonstrated, the method presented in this paper is very simple compared to the pairwise correlation method.

Optimal Portfolio Selection using Sharpe Ratio: In the financial model presented in this paper the optimal portfolio is created using the method of maximizing the Sharpe Ratio. In his original paper Sharpe (1994) says that "properly used, it can improve investment management". Sharpe Ratio = [(Portfolio Return – Risk Free Rate)/ Portfolio Standard Deviation]. To calculate the Sharpe ratio, we first need to estimate portfolio excess returns (Beninga, 2006). Portfolio excess return is portfolio return minus risk free rate (specifically with reference to the Excel sheet presented in Table 2 the formula is "=AVERAGE(D16:D25)", where each of the cells D16 to D25 have been calculated subtracting risk free rate from the portfolio return of the specific year "=C16-G4"). Sharpe ratio is calculated by dividing portfolio excess returns by portfolio standard deviation. Sharpe ratio shows excess returns obtained by the portfolio manager per unit of risk taken, where risk is measured using portfolio standard deviation. Sharpe ratio is a well-accepted measure of performance of portfolio managers and fund managers (Reilly & Brown, 2006).

In this paper portfolio selection is done my maximizing the portfolio Sharpe ratio. In this paper the process of portfolio optimization was done using the "Excel Solver Add-In". The solver allows for maximizing the Sharpe ratio subject to a series of constraints. The key constraints used in this paper, as well as the method used in implementing solver are shown in Table 3 given below. Two types of constraints were used. One set of constraints ensure that the weight of each security in the portfolio remains between 0 and 1, implying that the amount invested in a particular security is more than zero but less than total amount of funds available for investment. The other constraint ensures that the sum of weights is less than 100%. The final optimized portfolio is shown in Table 2. It shows that in the final portfolio only two out of the three securities are included. Stock BB has a zero weight. The solver solution also indicates that 59.6% of the available funds should be invested in stock AA, and 40.4% in stock CC. The financial model can be easily extended to include more number of securities. As mentioned earlier the Excel model was tested with a portfolio of 30 securities.

Table 3



3. Test Results

In this section the results of testing the excel model with a portfolio of 30 securities are presented. For the purpose of constructing the optimized portfolio, the thirty stocks comprising the Dow Jones Industrial Average were included in the original equity portfolio. Estimation was done using monthly returns from January 1999 to December 2010. One stock (Kraft Foods) had to drop due to non-availability of data from 1999. The objective of the optimization process was to create a portfolio which maximizes the Sharpe Ratio subject to a 15% constraint on the weight of each stock included in the optimized portfolio. Nine stocks out of the thirty were selected by the Solver software during the optimization. Table 4 shows the benefits of the optimization process in terms of improvement in annualized returns and reduction in risk (measured by standard deviation). Table 5 given below reports the original equally weighted portfolio and the optimized equity portfolio.

Table 4: Beneficial effects of Sharpe Optimization

	Annualized Returns%	Sharpe Ratio	Monthly Standard Deviation%
Equally Weighted Portfolio	8.025	0.0927	4.83
Optimized Equity portfolio	12.33	0.176	4.57

Table 5: Original versus Optimized Portfolio

Original Equity Portfolio		**Optimizing Equity Portfolio**	
Sharpe Ratio	0.0927	Sharpe Ratio	0.176
Stocks drawn from Dow Jones Industrial Average	**Weight**	**Stocks selected during optimization process**	**Weight**
CHEVRON	3.45%	CHEVRON	15%
PROCTER	3.45%	PROCTER	15%
3M	3.45%	3M	14%
CATERPILLAR	3.45%	CATERPILLAR	13%
UNITED TECH	3.45%	UNITED TECH	12%
EXXON MOBIL	3.45%	EXXON MOBIL	10%
Mc DONALD	3.45%	Mc DONALD	9%
HP	3.45%	HP	6%
TRAVELLERS	3.45%	TRAVELLERS	5%
JOHNSON	3.45%		
VERIZON	3.45%		
DISNEY	3.45%		
ALCOA	3.45%		
AMEX	3.45%		
ATT	3.45%		
BANK AMER	3.45%		
BOEING	3.45%		
CISCO	3.45%		
COKE	3.45%		
DUPONT	3.45%		
GEN ELEC	3.45%		
HOME DEPOT	3.45%		
IBM	3.45%		
INTEL	3.45%		
JPMORGAN	3.45%		
MERCK	3.45%		
MICROSOFT	3.45%		
PFIZER	3.45%		
WALMART	3.45%		

4. Summary and Conclusion

The Excel based financial model proposed in this paper gives a very simple but powerful method for portfolio selection. Apart from being a simple and powerful tool for making portfolio management decisions, the paper proposes an easy to use technique for calculating portfolio standard deviation without using correlation coefficients. Further revisions to the model so as to include borrowing and lending and short selling in portfolio management are possible.

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