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Increasing the managerial capabilities in Indonesian garment manufacturing

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Abstract: The paper aims at achieving two objectives:

- identifying why it is important to increase managerial capabilities in financial monitoring-and-evaluating activities in Indonesian Garment Medium Scale Manufacturers (IGMS)
- determining how a hybrid Knowledge-based System (KBS) can help improve the first objective

Observations and in-depth interviews are presented on four IGMSs. The analyses of literature review indicate that the integration of various Artificial Intelligence methods is an adequate approach for complex problem solving. This leads to an idea to combine the earlier KBS work with the more recent work of Financial Statements Analysis (FSA) methods.

Keywords: managerial capabilities; Indonesian-garment-manufacturing; hybrid knowledge-based-system; FSA; financial statements analysis.

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1 Introduction

Over the last 10 years, workers in the garment-manufacturing industry have become the essential contributors to Indonesia's Gross Domestic Product. This success inspired other countries, such as China, Vietnam, India and Bangladesh, to increase their activities in the garment-manufacturing branch. Because of the new competitors, new relations emerged between the five competing countries. Around 1990, Indonesia was the leader in the garment-manufacturing industry. However, between 1999 and 2004, China realised a growth of 380% of imported China garment to Indonesia. The huge import number may be even higher, since it is calculated only by the official garment import; it does not include the illegal import.

From 2004 to 2010, the China import to Indonesia continued to increase, although not in the same pace. On 1 January 2010, Indonesia implemented the zero-tariff import duties among the member countries of the ASEAN Free Trade Area (AFTA), including China as one of its partner trading countries. AFTA is an effort to eliminate tariffs placed on the intra-ASEAN trade. This policy aims at developing more trade and more industrial linkages among the ASEAN member countries. Yet, it also brings more challenging situations for Indonesian Garment Medium Scale Manufacturers (IGMS). Thus, the business owners will face tough decisions.

The IGMS owners usually focus on how to increase the sales, but rarely focus on how to manage the company efficiently, and how to exploit historical financial performances in their decisions. Although they might obtain any profit by doing their daily activities,

they suffer many times from low profit because of the inefficiency and even of internal frauds. The decisions should in first instance be taken by the financial managers, following the owner's intuition. Without a clear view on what is happening in their daily business, financial managers usually respond too slowly to the changing situations and the remarkable circumstances. As soon as they start to understand the dark clouds above the circumstances, their first reaction will be to find a means to increase their managerial capabilities. So, it is important to focus on how to increase the managerial capabilities of IGMS managers. This may be a first step to re-build IGMSs competitiveness. Since most of the IGMSs managers do not have financial expertise, they need to be supported by the knowledge of experienced financial experts on monitoring-and-evaluating the IGMSs' financial activities or by KBSs.

Inspired by the success of the KBSs implementation on FSA from previous studies (e.g., Huang, 2009; Khan and Wibisono, 2008; Shiue et al., 2008; Wahdan, 2006), we propose an Automatic Formulation of a Financial Report (AFFAR) system. AFFAR is a hybrid KBS that integrates the use of

- an Accounting Information System (AIS)
- a KBS
- the Analytic Hierarchy Process (AHP) techniques in FSA methods to produce an experienced financial expert's analysis on monitoring-and-evaluating financial activities.

The first subsection of the introduction presents two Research Questions (RQs), Subsection 2 emphasises the two objectives of the research, and the last subsection shows the paper outline.

1.1 Two research questions

Facing the international price competitions, a manager of an arbitrary IGMS has the task to reduce the company's transaction costs. But, in the same time, his¹ task is also to enhance the quality of the products. One of the approaches to minimise high transaction costs is implementing a sequence of efficient financial monitoring-and-evaluating activities. The results of these activities will lead to provide financially related information on the interpretation of a company's performance. Using this interpretation, a manager may obtain insights into the company's future performance. Supported by those insights, a manager will be able to respond more quickly to the changing situations and the remarkable circumstances. Then, the challenging issue arisen is how a manager will be able to interpret well the financial statements. One of the solutions is by increasing the managerial capabilities of the manager, especially in financial monitoring-and-evaluating activities.

The idea to increase the managerial capabilities is in line with Rice (2000b) who suggested to put more attention on internal management issues, such as a manager's knowledge and capabilities. Rice argues that a manager has to put his priority in amending his organisation internally. After the management restructure its organisation into a more effective and efficient organisation, it will be easier for the IGMS to get full support from other parties, such as government and banking. Without showing its excellent operation, it will take more time to build a fully conducive supporting

atmosphere from all external parties as each party has its own point of interest. Therefore, enhancing management's knowledge and capabilities are the top priorities in strengthening SMEs' competitiveness (cf. Matsuo, 2009; Miles et al., 2009; Rice, 2000b).

The efficient and effective use of knowledge resources is more important than the use of physical resources. Kristiansen (2004) identifies that a manager will be able to make more qualified decisions when he is supported with the knowledge about the organisation. Therefore, our research problem can be defined in two RQs. RQ1 reads: why it is important to increase managerial capabilities in interpreting FSA? RQ2 reads: can a hybrid KBS provide financial experts' opinion in interpreting FSA result?

1.2 Two objectives

The two objectives of this paper are:

- to identify why it is important to increase managerial capabilities in financial monitoring-and-evaluating activities in Indonesia, in particular for managers who work in IGMS
- to determine how and why a hybrid KBS can help improve the capabilities of managers in monitoring-and-evaluating activities.

1.3 Outline

The outline of this paper is as follows. Section 2 presents the research methods. Then, it is followed by the presentation of findings in Sections 3 and 4. Section 3 will answer RQ1. This section emphasises the importance of increasing IGMSs managerial capabilities in financial monitoring-and-evaluating activities. Section 4 deals with RQ2. This section discusses the idea to support the interpretation of FSA by a hybrid KBS. Finally, Section 5 summarises the results and presents our conclusions.

2 Research methods

Our research methodology consists of three parts, viz. literature review, fieldwork and analysis of the results. Literature review is a basic ingredient for this research. It is performed from four different angles. The topics are:

- 1 IGMS
- 2 AFTA
- 3 KBS
- 4 FSA techniques.

On the basis of the literature review, we suggest to develop a hybrid KBS for FSA that adequate with IGMS' characteristics.

To have more precise results, our research is conducted particularly in the IGMSs sector. Thus, the data collected can be compared straightforwardly because each company is

- from the same industry, which is garment manufacturing
- in the same scale category, which is medium scale
- from the same business and environment characteristics as coming from the same island, which is Java.

Using industry, company size and geographic as the control variables, the possibility to have a bias will be reduced.

Observations, in-depth interviews and semi-structured questionnaires were conducted to figure out whether KBS is a suitable solution for the daily challenges of the IGMS managers. Thirty-three respondents from four IGMSs in Java were selected in our sample. To elicit the knowledge only from the experts, this research focuses on sample characteristics such as level of education and years experiences. The interviews and observations for each IGMS were conducted separately, as each of IGMSs did not want to share their knowledge with their competitors. Finally, the four IGMSs companies remained anonymous and we were allowed to process the data for this paper. The analysis of the results of the literature review and in-depth interview leads us to our conclusions.

3 The importance to increase the managerial capabilities in FSA

This section briefly describes our finding on why it is important to increase managerial capabilities in interpreting FSA, especially when we consider the importance of the garment manufacturing by SMEs for Indonesia's economy, in the past, present and future. It discusses mainly three topics:

- 1 the recent role of garment manufacturing by SMEs
- 2 the challenges faced
- 3 the effort to increase the managerial capabilities in FSA as a significant approach to deal with the challenges.

The challenges for garment-manufacturing SMEs are relatively different from the challenges faced by (the) big garment-manufacturing units. The AFTA implemented by the Indonesian government in early 2010 may lead to different challenges for those garment-manufacturing types. Some of the businessmen are positive on the AFTA implementation, while others feel uncomfortable, as they believe that AFTA will hit negatively the following industries,

- textile and garment industry
- footwear industry
- electronic industry (Wirawasta, 2010b).

Section 3.1 presents the importance of garment-manufacturing SMEs for Indonesia's economy. It is followed by a brief analysis of AFTA's double-edged effects in Section 3.2. After understanding the importance and the existing condition of IGMS, we focus on the causal of the challenges. Finally, we describe our phenomena bundle to illustrate the causal relationship between phenomena in Section 3.3. Section 3.3 leads us

to realise the importance to increase the managerial capabilities in interpreting FSA results for IGMS managers.

3.1 The importance of garment manufacturing by SMEs

The role of garment manufacturing by SMEs is important for Indonesia's economy because of

- its high employment absorption level
- its significant contribution to Indonesia's Gross Domestic Product.

In addition, the garment industry plays a significant role on the textile industry. Jamaludin, chairman for a committee in Asosiasi Pertekstilan Indonesia (API – Indonesia Textile Association), stated that a decrease in the garment export usually leads to a significant decrease in the textile export. The garment export performance can contribute to about 60% of the textile export performance (Kabarbisnis.com, 2009b).

Rice (2000a, 2000b) demonstrated that SMEs have made quite important contributions to Indonesia's development in the past, and will continue to do so in the future, in particular with respect to

- employment generation
- income generation.

Although this finding is the result of research conducted 10 years ago, the two issues are still relevant. In Indonesia, there are about 49.8 million SMEs, they absorb 97.3% of the total employment and contribute up to 53.6% of the total Gross Domestic Product (BPS-Statistics Indonesia, 2008). In 2008, the SMEs in Indonesia even reached the highest employment absorption level among the members of the Association of Southeast Asian Nations (ASEAN) countries (Regional Economic and Social Analysis Unit, 2008). The high employment absorption level is really important because Indonesia is categorised as a country that has a huge number of populations with a lack of social security funds. SMEs help the Indonesian government to minimise the unemployment rate. Hence, the SMEs' sustainability is the key for strengthening the growth of the Indonesian economy.

The Indonesian State Minister for Cooperatives and SMEs (2008) declared that till 2007 manufacturing had the highest employment absorption level (42.2%). The truth of this statement is based on the fact that textile and garment industry are two of the manufacturing types that have such a high employment absorption level. The textile and garment industry can absorb a huge number of employees who have a low level of education. This low-level-education type of citizen is still the majority of the Indonesian population. Therefore, the continuity of textile and garment industry becomes important for Indonesia's sustainability. The Indonesian Ministry of Industry coined textile and garment industry a 'strategic industrial sector'. Over the last three decades, the Indonesian garment industry has grown from a small sector to a major contributor to the country's total industrial revenue (Coster, 2007c). Textile and garment industry is definitely an income generator for Indonesia (Adam, 2004). For instance, the Indonesian textiles and garments exports to the USA have increased since 2002. Indonesia's share in global textiles and garment exports increased from 1.67% in 2004 to 1.79% in 2005, and it even increased by 12.5% in 2006. As a consequence of these growths, Indonesia

was recognised for its highest export growth to the USA. By exporting US\$ 3.1 billion of textiles and garment to the USA in 2005, Indonesia was ranked as the fifth biggest supplier to the USA, after

- China
- Mexico
- India
- Hong Kong (Coster, 2007a).

The 2006 performance was a great achievement for Indonesia's foreign trade. Yet, Indonesia had to be alert because Indonesia's garment industry did suffer from a lack of international competitiveness, in particular in price competition. The competitiveness of Indonesia's garment industry, especially at the domestic market, has decreased in comparison with the strong competitors in the upcoming developing countries, such as

- China
- Vietnam
- India
- Bangladesh (Thee, 2009).

The weak Indonesia garment products on the domestic market are shown by the percentage of product composition sold in the domestic markets (only 20%). Ernawati, Deputy for Cooperation and SMEs' Marketing and Business Networking, stated that Indonesia's malls and markets contain about 80% foreign garment products. This is an indicator that the continuity of the Indonesian garment manufacturing by SMEs is in danger (Silitonga, 2006). Moreover, the situation can become worse after implementation of the AFTA policy. So, the AFTA implementation can strengthen Indonesia garment industry, but in the same time it can also threaten garment manufacturing by SMEs.

3.2 The double-edged effects of AFTA

Our analysis shows that the future development in IGMSs will face some serious challenges, especially when the IGMSs have to compete with other countries given less trade protection by the government in both the domestic and the international market. The challenge for IGMS managers is that they have to reduce their transaction costs in unsupportive business environments. For instance, the implementation of the zero-tariff import duties for garment, as in force by 1 January 2010, has made the position of China garment products stronger in Indonesia's domestic market. As a consequence, the IGMSs have to put more effort into competing with the price and the quality of the China garment products.

Meanwhile, the role of cooperation between the ASEAN members is quite important. The AFTA would like to make ASEAN one of the world economy centres. The ASEAN members try to enhance the possibility of enduring the ASEAN market by their products. To achieve that, AFTA was established as far back as in January 1992. The goals of AFTA are to eliminate tariff barriers among the Southeast Asian countries with a view to

- integrating the ASEAN economies into a single production base
- creating a regional market of 500 million people (ASEAN Secretariat, 2002).

The expected outcomes of AFTA are

- to become a catalyst for greater efficiency in production
- to create long-term competitiveness for ASEAN
- to provide a wider choice of better-quality consumer products for ASEAN members (ASEAN Secretariat, 2002).

The ASEAN leaders have agreed to eliminate all import duties by 2010 for the six original members of ASEAN. The exception of ASEAN countries, which have not implemented AFTA in 2010, are

- Laos
- Cambodia
- Myanmar.

They will implement the free duty policy in 2012 (Sunarno, 2008). The AFTA realisation also has a correlation with some economic partners, in particular with

- China
- Japan
- the Republic of Korea (ASEAN Secretariat, 2002).

As a consequence, the AFTA implementation leads to the implementation of

- ASEAN-China Free Trade Area (AC-FTA)
- ASEAN-Japan FTA (IJEPA)
- ASEAN-Korea FTA.

To determine clearly the impact of AFTA for IGMSs, this paper will focus on the impact of the AC-FTA implementation.

This implementation can contribute to both positive and negative impacts on Indonesia's economy. Two groups look at the AC-FTA implementation from different perspectives, namely

- textile and garment businessmen who rely on the export market
- textile and garment businessmen who only rely on the domestic market (Wirawasta, 2010a).

The businessmen who rely on the export market are optimistic on AC-FTA. Their opinion is based on the on-progress recovery of the world economy. The recovery leads to an increase in the import level of some major importing countries such as

- USA
- European Union
- Japan (Wirawasta, 2010a).

The implementation of the AFTA also creates a bigger opportunity for exporting to other ASEAN countries. This intra-ASEAN cooperation is essential for Indonesia. As an example, we mention that the Indonesian textile industry supplied the needs of the fabric for the garment industry in Vietnam and Cambodia in the period of 2005–2008. This supply of needs contributed significantly to 5.5% export growth per year of Indonesia's exports to the ASEAN market (Sunarno, 2008). On the basis of information provided by BPS-Statistics Indonesia (2009), we see that the export of the garment industry is still significant to Indonesia's economy. Yet, in 2007, the Indonesian garment export growth was only 1.87%, as a consequence of the global financial crisis. It was below the garment export growth in 2006, where it reached to 12.23%. But, the garment export performance was doing better in 2008 and reached the level of US\$ 6,092,000. It means that there was 6.64% growth rate in garment export. This indicates a bright opportunity for garment industry. So, AFTA can certainly enhance the export possibility by providing bigger opportunity for exporting to other ASEAN countries. Moreover, we note that big garment manufacturing will be supported by AFTA, especially when the currency exchange is stable.

However, the businessmen who only rely on the domestic market will argue that SMEs garment industry is hit negatively by AFTA. Supported by the Indonesian Chamber of Commerce and Industry (KADIN Indonesia), they urge the government to cancel the implementation of AC-FTA (Wirawasta, 2010a). Their opinion is based on the fact that the China garment products have filled more than a third of Indonesia's domestic garment market. As stated previously, data from the API exposed a 380% growth of imported China garment products to Indonesia. The impact of the domination by China garment products is mostly felt by the IGMSs. Indeed, with AC-FTA, China garment products, legally and illegally, will be dominating easily the domestic market. Some experts forecasted that the increasing number of China garment export to Indonesia will cause about 30% decreasing on SMEs garment-manufacturing domestic sales (Kabarbisnis.com, 2010).

An illustration of a worse situation as faced by IGMSs is as follows. Idul Fitri and Christmas are the holy religious events that have a quite significant impact on the performance of the garment manufacturing and the retailing industries. Their sales performances can increase about 2 till 2.5 times the regular performance (Kabarbisnis.com, 2009a). Sutrisno, the chairman of API, stated that the potential sale of the domestic garment market typically reached till US\$ 3 trillions in this period. But, as the China products become more dominant in the domestic market, he predicted that IGMSs sales will decrease by a third in 2010 (Kabarbisnis.com, 2010). Facing the high production cost and high risk in the production, some IGMSs have changed their core business into a textile and garment retailer. It will be more profitable to sell low-cost-China products rather than to produce it. In addition, the risk of selling a China product is much lower.

The non-legal China products also dominate the domestic market. From a governmental point of view, the AC-FTA implementation will reduce smuggling practices. But, some experts predicted that smuggling of the China products will still happen, and it will even continue with the increasing trend in some product categories (Wirawasta, 2010b). The logic behind it is as follows. There are 311 tariff products. The import duties of garment products in the AC-FTA agreement are ranging from 5% to 15%. In 2010, there will be 84 tariff headings of garment that are still applied by 5%, and 52 customs tariffs that are applied by 15%, while the remaining 175 tariffs have a 0% import duty (Wirawasta, 2010b). The garment products in the 15% import duty

category are most widely consumed by the Indonesian people; examples are pants, shirts, and shirt of cotton or polyester material. In contrast, the products rarely consumed by Indonesian people, such as wool products, rayon and nylon, have a 0% import duty. It means that the Indonesian government's goal to lower smuggling of garment is still far from reality.

3.3 The phenomena bundle of our research domain

To analyse the core phenomena that have a great direct impact to the IGMSs correctly, the notion of problem bundle as used by Braun (2008) is adopted. The idea of that notion originates from Wieringa and Heerkens (2003). Braun explained a clear preference for using the notion 'phenomenon' instead of the notion 'problem'. The reason is that not every phenomenon needs to be a problem. The notion of phenomenon bundle can be used to select the core problems to be investigated in the research.

On the basis of Wieringa and Heerkens (2003), there are four rules (Rs) to select a proper core phenomenon: (R1) choose the phenomena close to the root of the sequence of causes, preferably the root phenomena themselves, (R2) choose phenomena that actually can be changed, (R3) choose phenomena that require actual research, and (R4) choose a reasonable number of phenomena.

SMEs and large enterprises are two distinct players within the Indonesian garment industry (Adam, 2004). These two players differ largely in terms of

- capital investments
- economies of scale
- production technology
- use of ICT
- design
- marketing skills (Coster, 2007b).

Therefore, the specific characteristics of an IGMS are really important to be considered in an effort to enhance IGMS performances.

To compete with the price competitiveness of foreign garment products, especially China garment products, an IGMS manager has to manage the business efficiently and effectively. The main goal is to focus on cost reductions in every part of the processes and business units. Thee (2009) proves that SMEs' manufacturing faces high transaction costs, because

- the management is not supported by the government
- the management cannot optimise the use of technology
- the management made awful and immediate decisions without being supported by adequate data.

These issues can be grouped into

- external-related issues
- internal issues.

The external-related issues are caused by

- customer
- retailer
- government that lead IGMSs to unsupportive business environments.

Internal issues are mainly caused by the inappropriate management practices.

When an IGMS' negotiation power is low, customers can lead the company into high transaction costs. Most of the IGMSs receive their orders from worldwide brand companies. About 97 internationally well-known brand products are handled by IGMSs (Kabarbisnis.com, 2009b). When the global financial crisis started, consequently it had its impact on the Indonesian garment industry. When the international brand company tried to reduce its production cost, IGMSs sometimes were forced to make an unfavourable production. As an example, some of the international customers started to charge research and development costs to IGMSs (Kabarbisnis.com, 2009b). Previously, the costs were accounted to the customer.

Retailers can bring an abundance of problems to IGMSs. Garment domestic brands have a tough time competing with foreign brands. The reason is that SMEs of the Indonesian garment and textile manufacturers distribute their products mainly through

- traditional markets
- hypermarkets
- factory outlets.

Meanwhile, many department stores, hypermarkets and shopping malls are reported to have restricted the entry of locally made garment by applying certain requirements (Coster, 2007d). These retailers try to have more profit from domestic products by applying complicated requirements that weaken IGMS position, for example, they can terminate or have bigger portion from the profit of the goods when the sales performances of that goods are decreasing during several months. Another example is the requirement that IGMS have to accept all returns from the retailers. Meanwhile, retailers often return garment products. It leads IGMSs to cash-flow difficulties and unsold products (Winarto and Gunawan, 2008). The unsold products are after being returned usually sold for a very low price. This unbalance negotiation power is because the retailers assumed that IGMS products obtain an advantage by their brand. Therefore, they usually ask a substantial number of things from the IGMSs. This situation leads to increasing costs of the IGMSs garment products.

The Indonesian government has a specific development strategy for the textile and garment industry. Government policies should create a more conducive business climate, with a focus on

- a smoothly operating port and customs sector
- business-friendly taxation
- a less rigid banking and finance sector
- sustainable energy supply

- a fairly functioning labour market
- a better access to worldwide markets via the negotiation of free trade agreements (Coster, 2007f).

But in the same time, the implementation of government policies is not as smooth as the plan. IGMSs usually lack capabilities to handle successfully domestic problems caused by

- bureaucratic instances (e.g., to obtain permits)
- taxation
- labour issues (Coster, 2007b).

Coster (2007e) predicted that the Indonesian garment industry will have hard times to compete with China because there are much-needed investments in

- production technology
- human resources.

If the necessary governmental funding triggers a massive investment in the industrial needs, then the medium and long-term prospects of the garment industry would be really promising.

To understand the unsupportive business environment, we point to several weak issues in the Indonesia textile and garment industry when compared with China, such as

- the commercial interest rate
- handling of the energy crisis
- the low human productivity
- the high cost of the Indonesian harbours.

In early 2010, most banks have an interest rate for productive credit of still 14%, meanwhile in China it only reaches 6%. It is hard for an IGMS to use any funds from banks with this high interest rate. The energy crisis in Indonesia had an impact to the high electricity price, and resulted in higher transaction costs for IGMSs. The IGMSs productivity, competitiveness and export performance have a considerable lag with respect to the big companies (Regional Economic and Social Analysis Unit, 2008). This issue is the most crucial point. IGMSs managers have to do their utmost to increase the productivity by monitoring and evaluating the activities. The high cost of the Indonesian harbours is as heavy as the impact of the US dollar in the transactions; other countries regulate the use of their local currency as a mean in the negotiation. A high currency exchange from IDR to US\$ has as its implication higher costs reflected in the price of garment products. Finally, the weak issues can be grouped into

- lack of capital
- lack of skills
- problems in the productivity and business development (Abduddin, 2006; Indarti, 2006; Soetrisno, 2009).

The lack of skills in IGMSs can be divided into

- lack of skills on the management level
- lack of skills on the production level.

Limanjaya and Gunawan (2007), Winarto and Gunawan (2008) elaborated on the observation that most of the IGMSs run their business based on the owners' intuition, whereas the owner possesses a lack of managerial skills on monitoring and evaluating the company's financial performance. These activities are a hard task for the IGMS managers because of their lack of financially related experiences and expertise. Taking into account the numerous methods in FSA, the interpretation of a specific case by the owners may vary significantly from the experts' interpretation. Moreover, in daily practice, managers in an IGMS are persons who are family related to the owner(s). They focus on how to increase the sales but rarely focus on how to manage the company efficiently. For instance, they did not pay attention to a customer's debt accumulation. They kept in their mind that the more sales by a customer, the more profit will be achieved. But, they did not consider the risk of having a big debt that exceeds from the maximum debt per customer (Kurniawan and Gunawan, 2007).

On the basis of the above-mentioned issues, this paper presents a brief simplification of phenomena. We start with three *phenomena*: there is

- an unawareness of information need (P0)
- a lack of financial experience and expertise (P1)
- a large amount of FSA methods (P2).

The combination of P0 and P1 leads to inadequate monitoring-and-evaluating activities (P3). The combination of P1 and P2 leads to an inability to interpret FSA reports (P4). P3 has two immediate consequences. They are characterised as

- internal frauds (P8)
- unskilled employees (P9).

In combination with P4, P3 leads to awful management decisions (P10). At the level of P8, P9 and P10, we see three new *phenomena* occurring: P5, P6 and P7. P5 is lack of investment, P6 is unsupportive regulation, and P7 is non-official cost. The range P5–P10 leads to a next level of three phenomena:

- lack of capital (P11)
- problem in productivity business development (P12)
- lack of skills (P13).

They lead to three results in efficiency and ineffectiveness in production distribution processes (P14). From P14, we arrive at an IGMS' lack of competitiveness (P15), see Figure 1.

Recently, Thee (2009) has suggested that to minimise the high transaction costs, the government could do a great deal to help manufacturing firms, viz. by

- clamping down on corruption by government bureaucracy (particularly the custom service)
- providing legal certainty
- issuing more business-friendly labour regulations.

These suggestions will support competitiveness of IGMSs if other parties are willing to participate. It will require greater efforts to build an overall commitment to support IGMS because P5, P6, P7 and P8 are fully dependent on other parties.

According to R1, the root *phenomena* are P0, P1 and P2; thus, they should be the core *phenomena*. However, P0, P1 and P2 are pre-defined characteristics of a research domain that cannot be changed by the research. The closest *phenomena* to the root *phenomena* are P3 and P4. P3 and P4 match with all Wieringa and Heerkens' rules. Consequently, we selected P3 and P4 as our core *phenomena*.

Figure 1 The *phenomena bundle* of the research domain

The arrows indicate causal relationship between the *phenomena*.

Source: The method is adopted from Braun (2008)

Finally, we note that a manager's capabilities on monitoring and evaluating a company's financial performance are crucial and should be enhanced. The financial monitoring and evaluating can be done well when a manager is able to interpret the result of FSA in the right way. On the basis of the interpretation, the manager will be able to make adequate decisions. An effort to increase IGMS management's capabilities on interpreting FSA results is important for increasing SMEs competitiveness.

4 Supporting the interpretation of a Financial Statement Analysis by a hybrid KBS

This section will answer why a hybrid KBS is an adequate approach to increase managerial capabilities, especially in providing financial experts' interpretation on FSA results. To reduce the transaction costs, a manager has to be able

- to deal with the company's core business
- to determine the best possible estimates of a company's future performance.

In a rather short time period, a manager needs accurate information to support his decision-making. The information resulting from FSA can be used as the basis of those two issues (Shue et al., 2009). Using the interpretation of the results of FSA, managers will be able

- to focus on the financial goals and the business needs to pursue
- to improve their understanding about the condition of the company
- to explain the company's financial performance to their employees and to help motivate them to achieve new targets
- to structure the company into unit profit centres
- to identify short-term action plans for the company (Clive Reading, 2002).

To have a comprehensive conclusion that matches with the condition of the company, a manager has

- to calculate
- to combine
- to analyse numerous financial techniques altogether.

It will be easier to compute one financial technique, but it will be necessary to interpret the result of the techniques and compare it with other results. To have the right interpretation about the numbers resulted from FSA, a manager must have enough financial-related experience and expertise. Without any financial experience and expertise, the manager will not be able to have adequate monitoring-and-evaluating financial activities.

When a manager monitors and evaluates the financial statements through FSA methods, the biggest challenge to run across is that the interpretations resulting from FSA may vary among the managers, as a result of P3 and P4. The differences in the interpretations can be caused by the differences in

- the use of financial methods that matched with the critical characteristics of a particular industry or segment
- the manager's financial experience and expertise
- the accuracy and up-to-date financial data in the company
- the lack of communication and knowledge sharing among managers (Cheng et al., 2009).

When following the FSA, even professional financial analysts may be subject to the constraints of

- personal subjective views
- physical and mental fatigue, or possible environmental factors
- not being able to provide consistent appraisals (Shue et al., 2009).

As a result, an IGMS manager, especially a non-financial or novice manager, usually finds out numerous challenges on using FSA and interpreting the results.

Without a deep understanding about how to interpret accurately the FSA methods, numbers in FSA cannot be useful for a manager. For 25 years, Khan (1985) has emphasised that financial ratios serve only as indicators thus it is then up to the analyst to examine the unexpected further. Consequently, a non-financial manager and a novice manager need an experienced financial expert with knowledge supporting the monitoring-and-evaluating activities. Even an experienced financial expert can have a second opinion when he is supported by a well-structured view on FSA (Wahdan, 2006).

Considering P3 and P4 as the weak issues of the IGMS managers, there is an urgency to support them with powerful tools capable of enhancing their capabilities in facing FSA interpretation challenges, especially at times of continuous change (Kamel and Zyada, 2005). For obtaining experienced financial experts' knowledge in FSA, a KBS has been applied to imitate the decision processes and to provide the inference logic of the financial experts (cf. Shue et al., 2009; Wahdan, 2006). Other researchers verified that the integration of several artificial intelligence methods and techniques, known as hybrid KBS, is adequate for complex problem solving, such that appears in monitoring-and-evaluating activities (cf. Huang, 2009; Shue et al., 2009).

Wahdan (2006) emphasised that a KBS can be used to help a company to

- collect a complete set of information in the intelligence stage of decision-making
- select significant information and alternatives in the design stage of decision-making
- choose among alternatives in the choice stage of decision-making
- detect the weaknesses in the internal controls more effectively and efficiently.

Prior to Wahdan (2006), Kamel and Zyada (2005) elaborated that an adequate KBS consists of five subsystems:

- data management
- model management
- knowledge-based
- user interface
- users.

A data-management subsystem is a database of the relevant data. Model-management subsystems are software packages that include

- financial
- statistical
- other quantitative models that provide the system's analytical capabilities.

A knowledge-based subsystem provides expertise in solving complex unstructured and semi-structured problems through the use of an expert or other intelligent systems. User interfaces are all directed on the communication between a user and the software through graphical user interfaces. Users are people who use the KBS; they can be

- managers
- decision-makers
- knowledge workers
- business analysts
- staff members.

Considering the above-mentioned KBS competencies and the KBS subsystems, the task of formulating an experienced financial expert's interpretation is a suitable task for a hybrid KBS.

Dealing with P3 and P4 and inspired by the description of Future Research (FR) as formulated in previous studies by other researchers, we propose to use a hybrid KBS. The relevant sources of inspiration are mentioned here as FR1 and FR2.

FR1: The integration of Artificial Intelligence methods with an overall knowledge structure is the adequate approach for complex problem solving. All the FSAs may be set up independently as individual ontology (Huang, 2009; Shue et al., 2009; Wen et al., 2005). Multiple criteria decision-making approaches are well suited for the study of several financial decision-making problems (Xidonas et al., 2009).

FR2: The use of integrated FSA methods combined with the experiences of the financial experts will create a better KBS, under the assumption that there is no personal politics involved in the analysis process. Previous KBSs for FSA in developing countries, such as Indonesia, did not deal with the whole FSA methods. Rada (2008) recommended a combination of the earlier KBS work on financial accounting with the more recent work of FSA methods. Without using the comprehensive FSA methods, the ability to generalise the systems' conclusions was restricted (Wahdan, 2006).

On the basis of FR1 and FR2, we propose to conduct research on constructing a hybrid KBS for IGMS. The name given to the hybrid KBS is AFFAR. We start with a precise definition. AFFAR is a hybrid KBS that integrates the use of

- an AIS
- a KBS
- the AHP techniques in FSA methods to produce an experienced financial expert's analysis on monitoring-and-evaluating financial activities.

The FSA methods used in AFFAR are dealing with

- profitability
- solvency
- liquidity
- stability
- cash flow
- Altman *z*-score

- DuPont System
- common size balance sheet (Gitman, 2009).

AFFAR will provide suggestions based on

- the FSA interpretation knowledge from financial experts
- the company's historical transactions that are provided by the AIS.

AIS is a system that

- collects
- records
- stores
- processes financially related data to produce information for decision-makers.

By linking the KBS with the AIS of an IGMS, two functions will be the result. The first is a pure KBS function based on theory combined with a financial expert's opinion. The second is the endlessly up-to-date standard value and trend analysis resulting from the historical data of the company. Therefore, each KBS developed will be matched with the current characteristics of the IGMS under investigation.

Monitoring-and-evaluating activities occur at the same time in different departments, so each of the unit managers will react based on their own criteria. The difference in the managers' point of view will lead them into a different weighting criterion in the decision-making. To accommodate a different manager's point of view for a specific case, the AHP will be used. AHP is a structured technique for dealing with complex decisions with a focus to help the decision-makers find the one that best suits their needs and their understanding of the problem, using weighted factors for all the criteria. With the help of AHP, the managers will be able to contribute and make a decision based on the weighting factors of their own department's point of view and learn about the possibility that results from a KBS. Using AHP, the KBS will simultaneously be augmented with the functions of multiple criteria and a group decision (El-Sawalhi et al., 2007).

5 Conclusions

This paper has shown that the role of the IGMSs is important for Indonesia's economy. The competitiveness of Indonesia's garment industry, especially in domestic market, has decreased in comparison with the strong competitors from China. This situation can become even worse with the implementation of zero-tariff import duties among the ASEAN member countries, including China. When the IGMSs are unable to compete with the price competitiveness from the China garment products, Indonesia's economy will suffer. The reason is that an IGMS has quite important contributions to Indonesia's development for

- employment generation
- income generation.

On the basis of the literature review and interviews, we develop a ‘phenomenon bundle’ to illustrate the causal relationship of various challenging variables for IGMSs (Wieringa and Heerkens, 2003). Following the rule from Wieringa and Heerkens (2003), we conclude that our core phenomena are:

- inadequate monitoring and evaluating activities
- inability to interpret FSA reports.

These two phenomena support the root phenomenon, which is the question about how to increase the IGMS manager’s managerial capabilities. Thus, it is important to increase managerial capabilities in financial monitoring-and-evaluating activities in Indonesia, in particular for managers who work in IGMS. The next challenging issue for IGMS managers is that their interpretation of FSA may vary from the interpretation made by financial experts. Educational background and financial-related experiences are the major factor to the interpretation process of FSA result.

Considering the ‘phenomenon bundle’ and recommendation from previous studies by other researchers, we propose the use of a hybrid KBS. The hybrid KBS is a combination of

- KBS
- AIS
- AHP.

Supported by the financial experts’ knowledge stored in the hybrid KBS, IGMS managers will be able to interpret correctly the numbers resulted from various FSA techniques. The precision of the interpretation resulting from the KBS will be augmented simultaneously with

- the use of up-to-date daily information about what has happened in the daily performance from the AIS
- the overall management participation from the AHP.

Hence, we may conclude that the automatic FSA processes and its interpretation will be in line with the specific need of an IGMS.

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Note

¹Henceforth, for brevity we use 'he' and 'his' whenever 'he or she' and 'his or her' are meant.