

“Non-financial performance measures and managerial performance: the mediation role of innovation in an Indonesian stock exchange-listed organization”

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## Non-financial performance measures and managerial performance: the mediation role of innovation in an Indonesian stock exchange-listed organization

### Abstract

This study aims to investigate the effect of non-financial (NF) performance measures on individual performance through innovation in an organization listed on the Indonesian Stock Exchange. Analyzing with SmartPLS the usable data from a survey, the authors show that NF performance measures have a positive effect, fully mediated by innovation, on individual performance. It follows that to use NF indicators could enhance innovativeness and lead to the improvement of managerial performance. In other words, managers should take note of NF performance measures to enhance innovation that can lead to improved individual performance.

**Keywords:** non-financial performance measurement, innovation, managerial performance.

**JEL Classification:** M00, M40, M49.

### Introduction

Non-financial (NF) information helps to overcome the limitations of financial performance measures as a single indicator (Lau & Moser, 2008; Lau & Sholihin, 2005; Marginson, McAulay, Roush & van Zijl, 2014; O'Connell & O'Sullivan, 2014). In addition, NF performance measures (NFPMs) can effectively enhance communication between people in the organization (Simons, 1995). And, what is more, research also suggests that NF performance measures can boost long-term company success (Abernethy & Lillis, 1995; Banker, Gordon & Srinivasan, 2000; Banker, Potter & Srinivasan, 2005; Hoque, 2005; Ittner & Larcker, 1998b; Kaplan, 1984; Mia & Clarke, 1999; Smith & Wright, 2004).

Lee and Yang (2011) assume that when an organization uses NF performance measures, it will create internal processes that improve performance. Because of the shortcomings of purely financial performance measures, many authors mention the importance of NFPMs (e.g. Abernethy, Bouwens & Lent, 2013; Davis & Albright, 2004; Lynch & Cross, 1991) and there are many new researches in this area. Earlier, Hyvönen (2007) pointed out that 'there has not been much research on NF management accounting systems, [and] more work on NF measures is needed' (p. 360). Nevertheless, 'the limited empirical evidence on such measurements' financial performance effects is mixed' (Fullerton & Wempe, 2009, pp. 218-219). Therefore, the objective of this study is to investigate the extent to which NFPMs enhance performance. In particular, this study tests the extent to which NFPMs help managers.

NFPMs may not only improve organizational performance, but may also improve managerial performance. More than a decade ago Atkinson et al. (1997) advocated the importance of studying how NFPMs effected desirable changes in behavior, but empirical study of their effects is still scarce. Similarly, Hartmann (2000, p. 477) stated that "all of theory, and development, and empirical evidence, are scarce". Many researchers evaluated managerial performance using accounting and financial data. Evaluating the effect on individuals is important because the success of the company is determined not merely by company strategies but also, to a certain extent, by individual behavior within the company as people pursue those strategies. So it is important to find out how NFPMs contribute to individual performance.

As late as 2010, 'the relationship between performance measures and the development of innovative managerial practices (IMPs) is far from clear' (Abdel-Maksoud, Cerbioni, Ricceri & Velayutham, 2010, p. 36). To the best of our knowledge, only Bisbe & Otley (2004) agree. They investigated the effect of innovation at the organizational level rather than at the managerial level. Furthermore, they did not find evidence of the effect of interactive performance management systems (PMSs) on organizational performance through innovation.

Because of these arguments, this study asks '*to what extent does NFPM affect managerial performance directly and through innovation?*' We investigate Indonesian stock exchange-listed companies because the most advanced and largest companies in Indonesia are mostly listed on the stock exchange (Lau & Sholihin, 2005).

We pointed out that this study has several contributions. First, we explain how the NFPM can inspire innovation in a member of organizations and enhance managerial performance. Second, we study empirically the implementation of different measures

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in the Asian countries, more specifically in Indonesia. Previous studies have looked at western countries (Hussain & Hoque, 2002), and only rarely at Asian countries or at Indonesia. Scapens & Bromwich (2010) and Lindquist & Smith (2009) note that studies conducted in Asian countries made up only five per cent of published works in the last 20 years.

The next section, 1, will review the literature of NFPMs. Section 2 will develop hypotheses. Section 3 will explain our research methods. Section 4 will describe the results, and lastly, Final Section will explain our finding, conclusions and limitations.

## 1. Literature review and hypothesis development

Being aware of the shortcomings of purely financial performance measures, most companies use NFPMs to provide useful data to decision makers – data about customers, employees, market share, products, service, and quality – which must be provided as soon as possible (Ittner & Larcker, 1998b; Kaplan & Norton, 2001). NFPMs generate forward-looking information that cannot be captured using NFPMs' counterpart, financial performance measures (Decoene & Bruggeman, 2006; van Veen-Dirks, 2010). For example, Ittner & Larcker (1998a) say that when considering service quality and customer satisfaction,

NFPMs excel. Decoene & Bruggeman (2006) contend that these performance measures also help employees to envisage long-term goals and to channel their behavior.

The common use of NFPMs could equal the utility of financial measures, both as short-term indicators of progress and in the long term. They enhance managers' performance by providing better indicators of that performance (Banker, Gordon & Srinivasan, 2000; Banker, Potter & Srinivasan, 2005; Kaplan & Norton, 1992, 1996; Vaivio, 1999). In addition, some academics say that NFPMs make employees more flexible in their responses (Moulang, 2013). NFPMs encourage employees to be creative, whereas other measures focus only on money. Flexibility leads to new innovative ways to achieve targets. Innovation is more likely to increase managerial performance (Balsam, Fernando & Tripathy, 2011). We, too, believe that NFPMs enhance management through innovation.

Based on the above argument, we propose that NFPMs can enhance managerial performance through innovation. Hence, we develop the following research framework.

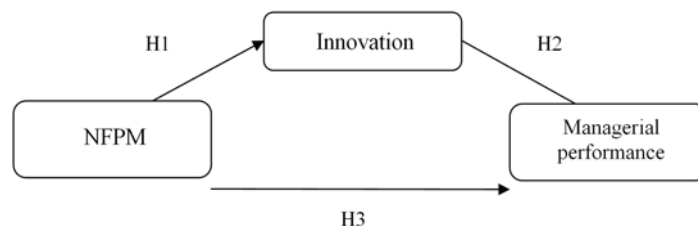


Fig. 1. A research framework

The following section discusses each hypothesis.

## 2. Hypothesis development

**2.1. NFPM and innovation.** It is argued that NFPM has a positive relationship with innovation. Different from *financial* accounting performance, the obvious advantage of NFPM is that it is able to capture broader aspects of performance than financial accounting performance measures (APMs) (Abernethy et al., 2013). Vagneur & Peiperl (2000) said that the use of APMs may lead to 'higher levels of data manipulation, distrust, rivalry, and dysfunctional decision making vis-à-vis cost, customer service and innovation'. Similarly, a company that relies on financial information alone is less innovative (Dunk, 2011; Storey & Kelley, 2001). Jon & Delbecq (1977) noted that innovation is more complex; thus, to measure complexity of innovation, it is not appropriate to use accounting performance measures. Supporting this argument, Balsam et al. (2011) contend that innovative differentiation is difficult when the organization focuses solely on accounting measures.

In contrast, NFPMs stimulate creativity by offering new ideas. NFPMs, unlike APMs, increase employee skills and knowledge, and encourage innovation. Widener (2006) suggested that APMs in fact impact *negatively* on strategic human capital. Vaivio (1999) explained that NFPM has more flexible control and facilitates the potential interactive role of strategic control. Due to this flexibility of control, employees can be more creative to explore new ideas (Davila, Foster & Oyon, 2009; Jørgensen & Messner, 2009; Moulang, 2013). Similarly, Bisbe & Otley (2004) revealed that NFPMs inspire individuals to be more creative and informative, as well as helping them to develop new ideas that benefit the organization (Bisbe & Otley, 2004; Evans III, Kyonghee, Nagarajan & Patro, 2010).

An example of a well-designed PMS that included NFPM is balanced scorecards from Kaplan and Norton (1992). Subsequently, McPhail, Herington, & Guilding (2008) pointed out that one of perspectives of the balanced scorecards – internal business process – has a close link to innovation.

To see how a person might seek ways to work more efficiently and to enhance customer satisfaction, we propose a hypothesis as follows:

*H1: There are positive relationship between non-financial performance measurements and innovation.*

**2.2. Innovation and managerial performance.** In some cases in reserch studies, Scott & Bruce (1994) note that creativity and innovation may be defined interchangeably. In addition, they mention that the difference is more one of 'emphasis than of substance'. Innovative ideas and insight that may suggest a new strategy can arise at lower levels within an organization (Vaivio, 1999). Lumpkin & Dess (1996) say that innovativeness can be achieved from a willingness by employees to generate new ideas about products, or services, or the use of technology.

At the organizational level, numerous authors investigated the relationship between innovativeness and performance (Camisón & López, 2010; Henri, 2006; Hult, Hurley & Knight, 2004). Camisón & López's study of Spanish industrial companies demonstrated that innovation enhances organizational performance. In addition, a study undertaken by Henri (2006) in Canada found that innovativeness has a positive influence on organizational performance.

At the employee level, any employee's innovation can reflect well on managerial performance. One innovation inspires another, as individuals throughout an organization become creative (Bharadwaj & Menon, 2000). Furthermore, Bharadwaj & Menon (2000) claim that innovation has an important role in facilitating employee skills in problem-solving. Empirical evidence can be seen from Gong, Huang & Farh's study (2009), in which innovation is positively associated with managerial performance. Similarly, Subramaniam & Mia (2001) found that managers with high innovation tend to be more creative and innovative. In line with these explanations, we propose the following hypothesis:

*H2: There is a positive relationship between innovation and managerial performance.*

**2.3. Non-financial performance measurement and managerial performance.** Hopwood's study (1972), which was undertaken with cost centre managers in an integrated single US manufacturing company, shows that emphasis on budget constraints significantly correlates with job tension. Furthermore, strict adherence to financial data leads, again, to a "higher level of data manipulation, distrust, rivalry, and dysfunctional decision-making vis-a-vis cost, customer service and innovation".

Although that result was questioned by Otley's study (1978), in the current situation the use of financial data alone is not appropriate. Performance is not measured only by APMs. NFPMs reduce the potential side of

dysfunctional behavior. Furthermore, they lead managers to improve performance in the absence of information from accounting measures (see: Ittner & Larcker, 2009; Van der Stede, Chow & Lin, 2006). Vaivio (1999) notes that NFPMs function as strategic controls. Additionally, Banker et al. (2000) reveal that NFPMs are more valuable than APMs in motivating managers, and Kaplan and Norton (1992) suggest that NFPMs help managers to understand and solve problems.

The obvious difference between APMs and NFPMs is that NFPMs focus on long-term strategic objectives (Sholihin, Pike, & Mangena, 2010). As they can provide transparent evaluation, they help communication between upper and lower level employees about the organization's targets, and indirectly drive performance (Lee & Yang, 2011).

The effect of NFPMs on managerial performance has been shown from previous research such as Sholihin and Pike (2007) and Lau & Sholihin (2005). These findings suggest that NFPM has a positive association with managerial performance. Thus, we present the following hypothesis.

*H3: There is a positive relationship between non-financial performance measurement and managerial performance.*

### 3. Research method

**3.1. Sample selection and data collection.** In this study, managers working in the head offices of the Indonesian stock exchange-listed companies are supplied with a self-administered survey. As with Yuliansyah & Khan (2015), the target of the study is middle level managers. Simons (1995, pp. 121-122) says that "middle managers are key nodes of the information network that reveals senior management's concerns and moves newly collected information up, down, and sideways in the organization". We distributed 350 questionnaires to companies listed in the Indonesia Stock Exchange, and received 83 responses. Some responses were incomplete. Accepting Hair, Black, Babin & Anderson's suggestion (2010) that missing data below 10% can be imputed from mean values, all 83 responses became usable; the per cent response is 23.7%.

Table 1. Respondents' demographic information

	N	%
Gender		
Men	41	49.45
Women	42	50.55
Total	83	100%
Age		
< 35	18	21.7
36-45	48	57.8
>46	17	20.5



Table 1 (cont.). Respondents' demographic information

	N	%
Total	83	100%
Education		
Diploma	7	8.4
Bachelor	56	67.5
Master/doctoral	20	24.1
Total	83	100
Division		
Accounting and finance	32	32.9
General	20	26.0
Human resources	15	16.4
Marketing	14	13.7
Others	2	11.0
Total	83	100%
Type of business		
Agriculture/mining	4	5.5
Manufacturing	45	47.9
Service-non-manufacturing	31	42.5
Other	3	4.1
Total	83	100%

**3.2. Variable measurement.** There are three variables in this study: NFPM, innovation, and managerial performance.

**3.2.1. NF performance measures.** NFPMs are adapted from Ittner, Larcker, and Randall (2003). These measures have been applied by Sholihin, Pike, and Mangena (2010). Ittner, Larcker, and Randall (2003) describe these strategic performance measures using value drivers for a company's long-term success – *product and service quality, operational efficiency, product and service innovations, number of customers, number of employees, supplier alliances, community and environmental reputation* – which are drawn from the balanced scorecard of intellectual and intangible assets as well as from

value-based management. Unlike Ittner, Larcker, and Randall (2003), who ask “who conducts research at the corporate level?”, our question follows Sholihin, Pike, and Mangena (2010, p. 30) who ask how much importance respondents thought their supervisors attached to the various performance evaluation categories when evaluating their performance. As do Sholihin, Pike, and Mangena (2010), we use a seven-point Likert scale, anchored 1 (no importance) and 7 (always important).

**3.2.2. Innovation.** The innovation instrument used by Subramaniam and Mia (2001) was originally developed by O'Reilly et al. (1991). The original instrument had 54 questions. It was further extended by Chatman and Jehn (1994) and Windsor and Ashkanasy (1996). Based on the previous three reports, Subramaniam and Mia (2001) chose instruments with the highest percentage of variance. We follow their six-item instrument – *innovation, opportunities, experimenting, risk-taking, careful, and rule oriented*<sup>1</sup>.

Respondents were asked to indicate to what extent their value as a member of their organization depended on: 1) being innovative, 2) being quick to take advantage of opportunities, 3) having willingness to experiment with new ideas, 4) taking risks, 5) being careful, and 6) being rule oriented. Each seven-point Likert scale was anchored 1 (not at all) to 7 (a great extent).

Table 2 presents the results of the description of variables used in the current study, containing the minimum and maximum scores, both the theoretical and the actual score, with mean and standard deviation.

Table 2. Descriptive statistic of the variables in the study

Variable	N	Theoretical range		Actual score		Mean	SD
		Min	Max	Min	Max		
NFPM	83	1	7	1	7	6.11	0.86
Innovation	83	1	7	1	7	5.89	0.89
Managerial performance	83	1	7	1	7	5.73	0.96

**3.2.3. Managerial performance.** Our measurement of managerial performance followed Mahoney et al. (1965). The Mahoney scale is extensively applied to measure managerial performance in the literature (Hall, 2008; Otley & Pollanen, 2000; Patiar & Mia, 2008; Sholihin & Pike, 2007; Webster, 2006). The self-rating questions rate nine dimensions of managerial performance relating to (1) planning, (2) investigating, (3) coordinating, (4) evaluating, (5) supervising, (6) staffing, (7) negotiating, (8) representing, and (9) overall performance (see appendix A3). Respondents were asked to indicate the extent to which the following items were used in evaluating their performance. A seven-point Likert scale was anchored 1 (below average) to 7 (above average).

## 4. Result

Before assessing structural models, we conducted an explanatory factor analysis using SPSS to establish uni-dimensionality. Table 3 shows that the exploratory factor analysis of eight items of NFPM becomes two factors; we labelled these factors as Products and Service indicators and Non-products and service indicators.

However, innovation is represented into one factor, where this similar to managerial performance.

<sup>1</sup> Italic word is cited from original word and it can be seen from Subramaniam and Mia (2001, p. 26).

Table 3. Factor loading for NFPM, innovation and managerial performances using PASW 18.0

No	Factors	Items	Factor loading	
1	Products and service indicator (Eigenvalue = 4.081, % of variance = 45.347)	NFPM1	0.496	<b>.650</b>
		NFPM2	0.561	<b>.602</b>
2	Non-product and services indicators (Eigenvalue = 1.064, % of variance = 11.824)	NFPM3	<b>0.681</b>	0.425
		NFPM4	<b>0.725</b>	0.143
		NFPM5	<b>0.717</b>	0.023
		NFPM6	<b>0.754</b>	0.131
		NFPM7	<b>0.632</b>	0.229
		NFPM8	<b>0.720</b>	0.344
3	Innovation (Eigenvalue = 3.411, % of variance = 56.856)	INNO1	0.856	
		INNO2	0.818	
		INNO3	0.715	
		INNO4	0.606	
		INNO5	0.730	
		INNO6	0.774	
3	Managerial performance (Eigenvalue = 6.086, % of variance = 67.627)	MP1	0.797	
		MP2	0.802	
		MP3	0.859	
		MP4	0.883	
		MP5	0.862	
		MP6	0.850	
		MP7	0.830	
		MP8	0.670	
		MP9	0.829	

### Two stages of Partial Least Square

In order to test the data, we applied Partial Least Square, in particularly, SmartPLS. The advantages of SmartPLS are 1) it is able to be applied to a small sample and 2) it involves fewer assumptions.

Some authors in management accounting apply PLS where their data are 100 points or less (Chenhall, Kallunki & Silvola, 2011; Mahama, 2006; Sholihin, Pike, Mangena & Li, 2011a). In regard to using the SmartPLS, it can be assessed into two stages: 1) an assessing measurement model that establishes on reliability and validity, and 2) the assessment of the structural model. The following section discusses the two stages.

### Measurement model stage

To assess reliability and validity, two points are analyzed in the measurement model of reliability: 1) Cronbach's alpha, and 2) composite reliability (internal consistency).

The acceptable score of Cronbach's alpha and composite reliability exceeds 0.6 and the satisfactory level is higher than 0.7 (Birkinshaw, Morrison & Hulland, 1995).

Table 4. AVE, composite reliability and Cronbach's alpha

Variable	AVE	Composite reliability	Cronbach's alpha
NPM1	0.710	0.830	0.611
NPM2	0.530	0.871	0.823
Innovation	0.568	0.886	0.844
Managerial performance	0.676	0.949	0.939

Table 4 illustrates that Cronbach's alpha and composite reliability range between 0.611 and 0.949. Thus, reliability of all variables of the study is adequate. Another test of measurement model is the validity test. There are two types of validity test: 1) convergent validity, and 2) discriminant validity. Convergent validity is seen from Average Variance Extracted (AVE). Henseler et al. (2009) say that an AVE score is considered good if its score is higher than 0.5. Table 4 seems that AVE of all items is more than 0.5. Hence, convergent validity of all variables is good. Discriminant validity is evaluated in two measures: the Fornell-Larcker measure, and cross-loading. Fornell-Larcker measures can be observed through the comparing of the square root of the AVE on the latent variables correlations. Discriminant validity is sufficient when the value of the square root of the AVE along the diagonal is higher than the correlations between constructs (Fornell & Larcker, 1981).

Table 5. Discriminant validity of latent variables correlations

Latent variables	Correlations			
	NPM1	NPM2	Innovation	Managerial performance
NPM1	<b>0.843</b>			
NPM2	0.460	<b>0.728</b>		
Innovation	0.266	0.540	<b>0.754</b>	
Managerial performance	0.255	0.422	0.664	<b>0.822</b>

Table 5 illustrates that all square roots of the AVE exceed the off diagonal in both rows and columns.

In addition, discriminant validity through cross loading suggests that all items should be greater than 0.7 and higher than any other constructs (Al-Gahtani, Hubona & Wang, 2007; Barclay, Higgins & Thompson, 1995). Table 6 exhibits that all constructs are above 0.7 and those constructs are greater than any other constructs. This means that statistical result of discriminant validity is satisfactory.

Table 6. Factor loading using PLS

	NFPM1	NFM2	Innovation	MP
NFPM1	<b>0.841</b>	0.346	0.181	0.257
NFPM2	<b>0.845</b>	0.411	0.266	0.173
NFPM3	0.344	<b>0.682</b>	0.261	0.185
NFPM4	0.425	<b>0.737</b>	0.375	0.317
NFPM5	0.257	<b>0.764</b>	0.437	0.251
NFPM6	0.384	<b>0.766</b>	0.408	0.384
FNPM7	0.252	<b>0.697</b>	0.450	0.319
FNPM8	0.317	<b>0.719</b>	0.402	0.271
INNO1	0.324	0.512	<b>0.861</b>	0.600
INNO2	0.214	0.326	<b>0.818</b>	0.562
INNO3	0.113	0.566	<b>0.729</b>	0.410
INNO4	0.115	0.385	<b>0.616</b>	0.414
INNO5	0.166	0.329	<b>0.713</b>	0.427
INNO6	0.235	0.311	<b>0.761</b>	0.564
MP1	0.268	0.372	0.510	<b>0.795</b>
MP2	0.255	0.365	0.591	<b>0.805</b>
MP3	0.185	0.335	0.559	<b>0.855</b>
MP4	0.230	0.268	0.535	<b>0.879</b>
MP5	0.224	0.351	0.546	<b>0.860</b>
MP6	0.140	0.311	0.506	<b>0.842</b>
MP7	0.273	0.308	0.534	<b>0.831</b>
MP8	0.139	0.385	0.548	<b>0.684</b>
MP9	0.165	0.297	0.565	<b>0.833</b>

Hence, the statistical findings using PLS of each construct demonstrate adequate reliability and validity. The next step is to test the assessment of the structural model.

#### *The assessment of the structural model*

The structural model can be tested using the coefficient of determination ( $R^2$ ) and Path Coefficients. The aim of coefficient determination testing is to measure the explained variance of an LV relative to its total variance. Further, this assessment was conducted by testing  $R^2$ . Acceptable  $R^2$  scores are those above 0.1. Table 7 exhibits that

the  $R^2$  of dependent variables is higher than 0.1. Thus, coefficient determination is acceptable.

Additionally, path coefficients testing ( $\beta$ ) is conducted to ensure that relationship between constructs is strong. This testing was carried out using a bootstrap procedure with 500 replacements (e.g. Hartmann & Slapničar, 2009; Sholihin, Pike, Mangena & Li, 2011b). Urbach & Ahlemann (2010) claim that a path coefficient with score higher than 0.100 shows that the relationship between constructs is strong. Overall, the measurement model and the assessment of the structural model of this study are adequate. The next steps are testing hypotheses.

#### *Tests of hypotheses*

First we test Hypothesis 1 – that there is a positive relationship between NFPM and innovation. Table 7 exhibits that there is no significant affect between NPM 1 and innovation ( $\beta = 0.026$ ,  $t = 0.279$ ,  $p < 0.1$ ). In contrast, NPM 2 has a positive and significant effect on innovation ( $\beta = 0.533$ ,  $t = 5.564$ ,  $p < 0.01$ ).

◆ *H1* is partly supported.

Hypothesis 2 states that there is a positive relationship between innovation and managerial performance. Table 7 indicates that there is positive relationship between innovation and managerial performance ( $\beta = 0.628$ ,  $t = 5.782$ ,  $p < 0.01$ ).

◆ *H2* is supported.

Table 7. The result of PLS structural model: path coefficient,  $t$ -statistics and  $R^2$ 

Dependent variables	Independent variable			$R^2$
	NPM1	NPM2	Innovation	
Innovation	0.026 (0.279)*	0.533 (5.564)***		0.298
Managerial performance	0.075 (0.741)*	0.533 (0.256)*	0.628 (5.782)***	0.448

\* Significant at 10% (one-tailed), \*\* Significant at 5% (one-tailed), \*\*\* Significant at 1% (one-tailed).

Hypothesis 3 states that there is a positive relationship between NFPM and managerial performance. Table 3 illustrates that products and services have no positive effect on managerial performance ( $\beta = 0.075$ ,  $t = 0.741$ ,  $p < 0.10$ ). Additionally, NPM2 also has no positive association with managerial performance ( $\beta = 0.030$ ,  $t = 0.256$ ,  $p < 0.10$ ).

◆ *H3*, therefore, is rejected.

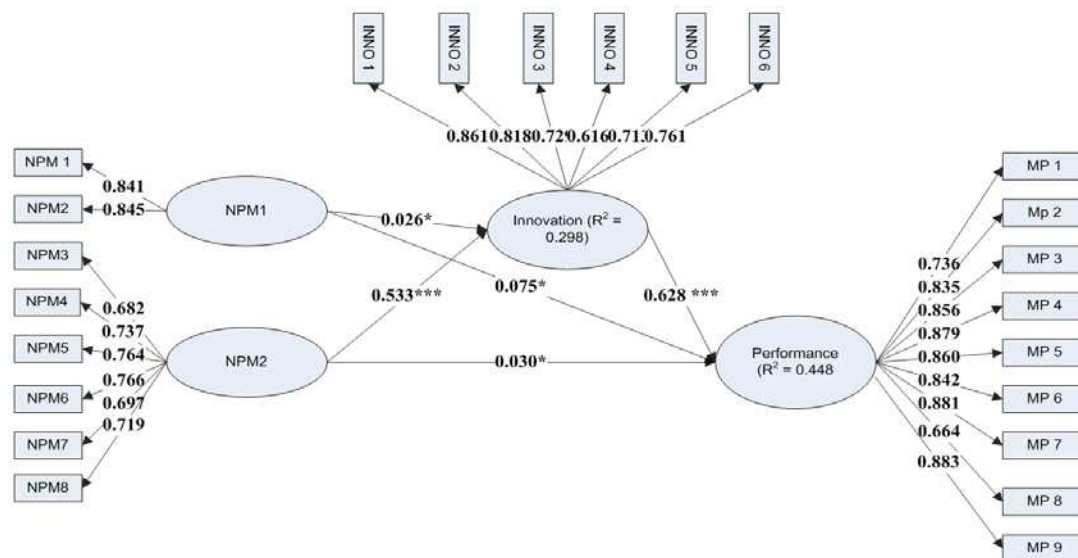


Fig. 2. A path model of the relationship: significant path coefficients, NFPM reliance and managerial performance

\* Significant at 10% (one-tailed), \*\* Significant at 5% (one-tailed), \*\*\* Significant at 1% (one-tailed).

In the path analysis of relationship between NFPM and managerial performance directly and indirectly through innovation, Figure 2 indicates that innovation significantly mediates the relationship. This is because the indirect relationships between them are strong. It does not seem that a *direct* relationship exists between NFPM and managerial performance.

### Discussion and limitation

Previous studies have established the importance of the use of NF performance measures on organizational performance (Abernethy et al., 2013). NFPM needs also to be taken to enhance managerial performance, as Hopwood (1972) explains. Reliance on accounting performance measurements alone fails to enhance performance. NFPM is not only useful to supplement financial measurements as short-term indicators of progress towards long-term goals, but it also gives employees appropriate feedback that is not available from accounting measurements (Atkinson, Waterhouse & Wells, 1997b; Davis & Albright, 2004; Itner & Larcker, 1998b). In this study, we extend the work of Bisbe & Otley (2004) who investigate the interaction of management control systems and performance.

Overall, the aim of this study is to answer the research question: to what extent does NF performance measurement influence managerial performance both directly and through innovation? In order to answer this research question, we conducted a survey of managers working in the Indonesian stock exchange-listed companies. Then, from 83 collected data points, we analyzed two step processes: measurement models and structural models.

In the measurement models phase, we tested the reliability and validity of each construct. Individual item reliability which is assessed by using PLS –

Cronbach's alpha – and PLS – Cronbach's alpha and composite reliability (internal consistency) – indicated that all constructs were above 0.8 meaning that all constructs are satisfactory. Validity was examined by two methods: convergent and discriminant validity. Discriminant validity itself was analyzed using two measures: the Fornell-Larcker measure and cross-loading. All methods of validity tests using PLS demonstrated that all variables were satisfactory.

The next step was assessing the structural model. In this step, we tested all the hypotheses with PLS. The results indicated that all hypotheses were supported. The results demonstrated that NFPM enhanced managerial performance directly, and indirectly through innovation. This finding supports Itner and Larcker's 2000 content that NFPM can boost managerial performance because it can provide evaluation more transparently. Additionally, because NFPMs tend to focus on long-term objectives rather than financial performance measures that focus on short-term goals, managers have more flexibility and time to innovate.

### Limitations and future research

Firstly, although the use of NFPMs is increasing, the sole use of NFPM as a single indicator to evaluate performance is unusual. Based on the advantages of financial measures which have been explained in the previous topic and also the limitations that could be covered by the use of measures, to gain more benefit we encourage people to combine both financial and NF performance measurements (Vaivio, 1999). Multiple measurements also reduce the risk of overlooking information that would be lost (Itner & Larcker, 1998b).



Secondly, using multiple performances measures (financial and NF) will provide quantitative and qualitative information to achieve a company's objective (Ittner et al., 2003). Further research can examine the effect on individual performance of the mediating factor of innovation using multiple performance measurement.

The last limitation of our study is related to sample size. The results of this paper were derived from a survey of 83 respondents. We believe that small samples can be generalized to a larger group (Berdie & Anderson, 1976). Within limits, it should be possible carefully to generalize the results to all Indonesian stock exchange-listed companies.

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## Appendix

### Appendix A. Questionnaires and their measurement properties

#### A.1. Non-financial performance measurement

This section intends to gather information of non-financial performance measurement in your organization. Please circle the following scales for each of items listed below using scale 1 to 7 (*1 = not at all, 2= important, 3= slightly important, 4= neutral, 5= slightly important, 6=important, 7= strongly important*).

1. Your operational performance (e.g., safety, on time delivery, cycle time)
2. Your product and service innovations (e.g., new service products, service development cycle time)
3. Your relationship with customers (e.g., customer satisfaction, customer loyalty)
4. Your relationship with employees (e.g., employees turnover, employees satisfaction)
5. Your relationship with suppliers (e.g., input into product/service design, on time delivery)
6. Your alliances with other organizations (e.g., joint ventures, joint marketing)
7. Your community (e.g. public image, community involvement).
8. Your environmental (e.g., environmental compliance/certifications)

#### A.2. Innovation

This section intends to gather information of innovation of the members of organization. Please circle one number of the following six items, that indicates to what extent your members of organization do the following using scale 1 to 7 (*1 = not at all, 2= important, 3= slightly important, 4= neutral, 5= slightly important, 6=important, 7= strongly important*).

1. Being innovative
2. Being quick to take advantage of opportunities
3. Having willingness to experiment with new ideas
4. Being risk-taking
5. Being careful
6. Being rules oriented

#### A.3. Managerial performance

This section intends to gather information of managerial performance of your organization. Please circle one number of the following nine items, that indicates to what extent your members of organization do the following using scale 1 to 7 (*1 = not at all, 2= important, 3= slightly important, 4= neutral, 5= slightly important, 6=important, 7= strongly important*).

1. *Planning*. Determining goals, policies, and course of action; work scheduling, budgeting, setting up procedures, programming.
2. *Investigating*. Collecting and preparing information for records, reports and accounts, measuring output; inventory job analysis.
3. *Coordinating*. Exchanging information with people in your organization in order to relate and adjust programs; advising and liaison with other personnel.
4. *Evaluating*. Assessment and appraisal of proposals for reported of observed performance; employee appraisal, judging output records, judging financial reports; product inspection.
5. *Supervising*. Directing, leading and developing your personnel, counselling; training and explaining work rules to subordinates; assigning work and handling complaints.
6. *Staffing*. Maintaining the work force of your organization; recruiting, interviewing and selecting new employees, placing, promoting, and transferring employees.
7. *Negotiating*. Purchasing, selling or contracting for goods/services, contacting suppliers, dealing with sales representatives
8. *Representing*. Attending conventions, consultations with other firms, business club meetings, public speeches, community drives; advancing the general interest of your organization.
9. *Overall your performance*.