

Determinan Bias *Boundary* dan Bias Pengambilan Keputusan: Perspektif *Bounded Rationality Theory*

Boundary and Decision Bias Determinant: Bounded Rationality Theory Perspective

Rita Yuliana¹ Tito IM. Rahman Hakim² Hanif Yusuf Sepetro³

¹⁾²⁾³⁾University of Trunojoyo Madura, Indonesia

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ABSTRACT

In accounting, decision is an important aspect but prone to bias in its making process. Limitation in decision making that lead to bias is driven by some bound. This study aims to enunciate some bounds and identify bias determinant in decision making process. Literature review is employed to analyze thirty-four articles since 1986 until 2018 from renown journal publisher such as science direct, emerald, & Jstor regarding decision making in business field. The results shows that there are 9 bias determinant in decision making process such as task complexity, information presentation format, quality and quantity of information/data, situation/environment, competency, method, experience, personality trait and motivation. This article contribute to body of literature and decision makers by provide gap on decision making on the context of judgment bias and bias determinant that should take in to account before making a decision for better result.

ABSTRAK

Keputusan merupakan sebuah aspek penting dalam akuntansi namun sangat rentan bias dalam proses pembuatannya. Keterbatasan pada pembuatan keputusan yang mengarah pada bias dipicu oleh beberapa batasan. Penelitian ini bertujuan untuk menginformasikan beberapa batasan dan mengidentifikasi determinan bias pada proses pembuatan keputusan. Literatur revidi digunakan untuk menganalisa tiga puluh empat artikel sejak 1986 hingga 2018 dari jurnal ternama seperti science direct, emerald, & Jstor terkait pembuatan keputusan oleh auditor dan akuntan. Hasil penelitian menunjukkan bahwa terdapat 9 determinan bias yaitu kompleksitas tugas, format penyajian informasi, kualitas dan kuantitas informasi/data, situasi/lingkungan, kompetensi, metode, pengalaman, kepribadian dan motivasi. Artikel ini berkontribusi pada literatur dan pembuat keputusan dengan memberikan celah pada pengambilan keputusan pada konteks bias keputusan dan penentu bias yang harus diperhitungkan sebelum membuat keputusan untuk hasil lebih baik.

1. INTRODUCTION

Decision making is an interesting topic to be studied in more depth from the standpoint of behavioral accounting disciplines. Theoretically, a decision may have gone through a series of systematic and logical processes, but not necessarily the decision or opinion given is completely free of bias. This bias can arise due to cognitive factors inherent in human interactions, for example interactions between manager (as auditee) and auditors who audit financial statement. Giving an audit opinion for example, the opinion given is the result of a series of processes to deliver a decision.

Interest related to decision-making mechanisms in auditor or accountant profession is closely related to their role and function as providers of financial information services. Investment and divestment

* Corresponding author: rita.yuliana@trunojoyo.ac.id

opinions, going concern opinion, and audit opinion are a handful of information provided by the financial practitioner. The information is in turn used by users to make decisions on various alternative of choices. Therefore, the quality of information must be a priority aspect of each decision made by the accountants/auditors of the financial statements so decisions taken by users are precise and free of bias.

However, accountants and auditors face challenges in making decisions that have a certain quality. Behavioral or cognitive factors are one source of the challenge. These factors are internalized in accountants/auditors as individual and their existence is very essential considering that accountants/auditors when carrying out their duty need to interact with other people. Therefore, this article discusses the study of cognitive factors that bound decision making.

In this regard, this article presents a review of various published international journals about decision making in business fields. The purpose of this study is to find current issues regarding decision making, as well as to identify future research opportunities. This article reviews thirty-four publication articles about decision making, both by accountants, auditors, investors, and financial analysts. The contribution of this article is twofold. First, it gives insight for future research on decision making in the context of judgment bias. By reviewing some study on decision making especially judgment bias, authors obtain opportunity or gap that can be studied more in the future research. Second, for practical matters, it gives managers or decision makers some determinant of judgment bias. Therefore, decision makers have to take into account this determinant such as task complexity, information presentation format, quality and quantity of information/data, situation/environment, competency, method, experience, personality trait and motivation before making a judgment.

In the second part of this article, a general description of the thirty-four publication articles is examined. Furthermore, in the third section, an analysis of the topics of decision making is divided into three groups, namely in the fields of accounting, auditing, and others. The third section also presents the issue of experimental methodology applied to research. The fourth section presents future research opportunities and finally the closing remarks.

2. RESEARCH METHOD

This study utilizes literature review to analyze several articles reviewed by authors. Search on decision-making topics are done online by referring to journal databases such as www.sciencedirect.com, www.emerald.com, www.jstor.org and www.scholar.google.com. They are chosen for their user-friendly feature in search engine. The keywords used are "judgment", "decision making", "auditor", and "accounting". Hereinafter, from the list obtained, authors choose a complete journal (full text) in PDF format. Authors also take into account the journal's reputation as a consideration for article selection. Authors then read abstracts of a number of articles to obtain preliminary information about the suitability of the journal with the specified topic.

Out of the thirty-four studies examined, the publication period began from 1986 to 2018. The journals were published in the United Kingdom and the United States, for example Auditing was published in the United States while Accounting, Organizations and Society were published in England. Furthermore, the proportion of research topics based on the unit of analysis is twelve studies on decision making by auditors, two investors, two analysts, two internal accountants, and two managers.

3. RESULT AND DISCUSSION

Decision Making in Behavioral Accounting Research Domain

In the context of accountant or auditor, the problem of decision making occurs when the accountant or auditor interacts with other parties (for example auditor-client or accountant-manager). This interaction causes self-serving bias (Bazerman 2006:1), which is a decision making bias because someone is in an imperfect information processing condition. Bazerman (2006:7) mentions several factors that constitute determinants of decision making bias. These factors serve as a guide in examining various determinants of decision making bias that have been identified from the thirty-four studies examined in this article.

Bazerman (2006:7) point out the following as a brief explanation regarding five factors that limit (bounded) the decision making process i.e.

1. Bounded Rationality

Simon (1957) in Bazerman (2006:6) is the one who states the term regarding bounded rationality and sees there are limitations on individuals in making rational decisions. Rationality itself is interpreted

as a decision making process that is logically expected to obtain optimal results, based on an accurate assessment of the value and risk of the decision maker. While the limitations referred to in bounded rationality comprise limited information about the definition of the problem, limited time and cost that have an impact on the limited quantity and quality of information, limited memory, and limited intelligence and perception.

2. **Bounded Willpower**
 Identification of bounded willpower as one of the factors causing the decision making bias is conveyed by Thaler (2000) in Bazerman (2006:7). Limited willpower refers to behavioral tendencies to give greater weight to current attention than future attention. The behavior causes a temporary and inconsistent motivation.
3. **Bounded Self-Interest**
 Thaler (2000) in Bazerman (2006:7) also identifies limited self-interest as one of the causes of decision making bias. Bounded self-interest is related to fairness judgment that arises when decision makers are required to interact with others in social communities so that it impacts on emotions and behavior. Situational issues such as salary gaps, limited budget distribution, promotion, ranking, and pricing is triggered for bounded self-interest.
4. **Bounded Ethically**
 The concept was introduced by Chugh, et al., (2005) which was stated as an innate tendency for individuals to commit to self-deception through moral considerations in the decision making process. However, Badaracco and Webb (1995) state that training on ethics limits behavior improvisation and opposition to motivation for profit. Therefore, the direction of bounded ethically does not always encourage bias, it could be that it plays a role in limiting bias.
5. **Bounded Awareness**
 Identification of bounded awareness as a factor causing decision bias was raised by Chugh, et al., 2005. This factor refers to failure to identify clear warning and important information that is already available. The form of bounded awareness includes (1) not paying attention to clear information, (2) failure to pay attention to real environmental changes, (3) tendency to focus on only part of the problem being faced, as bounded awareness is faced by (4) groups, (5) negotiators, and (6) bidders at auction.

The studies examined in this article confirm various constraint to decision making. Based on the type, there are two types of research regarding decision making, namely prescriptive and descriptive. Prescriptive research presents method for making optimal decision, while descriptive research presents consideration about the limitation that exist in the actual decision making process. Based on these groupings, all journals examined in this article are classified as descriptive research.

Table 1 exhibits the identification of bias determinants in decision making sourced from thirty-four journals reviewed:

Table 1. Decision Bias Determinant

No.	Bias Determinant	Journal
1.	Task complexity	Brazel and Agoglia (2007); Bonner (1994); and Blocher et al. (1986); Mascha and Miller (2010); Sanusi, et al. (2018).
2.	Information presentation format	Blocher et al. (1986); Cardinael (2008); Heintz and White (1989); and Mastilak (2011).
3.	Quality and quantity of formation/data	Carpenter and Dirsmith (1992); Chen, et al. (2012); Eames, et al. (2005); Fay, et al. (2015); Ganguly et al. (1994); Heintz and White (1989); Lachmann, et al. (2011); Mascha and Miller (2010); Schultz, et al. (2009); Tucker and Matsumura (1997); and Wainberg (2018).
4.	Situation/environment	Alon and Dwyer (2010); Arel and Cianci (2012); Arnold, et al. (2013); Chang et al. (2008); Chatterjee et al. (2000); Gramling, et

		al. (2010); Ganguly et al. (1994); Hoffman, et al. (2003); Martinov and Mladenovic (2013); Pathak, et al. (2010); Tsunogaya, et al. (2016); and Yen, et al. (2017).
5.	Competency	Ahlawat (1999; Bonner (1994);); Brazel and Agoglia (2007); Cardinael (2008); Jennings et al. (1998); Mascha and Miller (2010); Pathak, et al. (2010).
6.	Method	Tucker and Matsumura (1997); Waller et al. (1999);
7.	Experience	Hoffman, et al. (2003); Schultz, et al. (2009).
8.	Personality Trait	Sanusi, et al. (2018); Schauß, et al. (2014)
9.	Motivation	Baliey, et al. (2005); Moore, et al. (2010); Tsunogaya, et al. (2016).

Based on the results of the identification of bias determinants as shown in table 1, it appears that there are eight determinant bias decisions derived from thirty-four studies reviewed. Furthermore, the determinants will be discussed based on explanations derived from five factors that limit (bounded) the decision-making process (Bazerman, 2006:7). The following is a review of each determinant of bias:

1. Task Complexity

The issue of task complexity becomes a relatively "lasting" research material. This is evidenced by researchers who raised the issue from 1986 to 2018. Related to decision making bias, task complexity in the study of Blocher et al. (1986) interacts with the information format to test its effect on the bias and precision of decisions about risk assessment by auditor, while Bonner (1994) examines the effect of the complexity of the tasks and skills of auditors on the quality of auditor decisions, either experienced or knowledgeable auditors. Brazel and Agoglia (2007) shows that in a complex environment, the auditor's risk assessment is influenced by the competencies of his coworkers. Mascha and Miller (2010) find that auditor who get complex task tend to overstate internal control risk assessment. Finally, Sanusi, et al. (2018) provide evidence that task complexity moderating the effect of self-efficacy to audit judgment performance.

Based on research by Blocher et al. (1986) and Bonner (1994) it is proven that task complexity influences decision bias, both directly and interaction. Furthermore, Brazel and Agoglia (2007) make environmental complexity as a situation that underlies testing the effect of competence on the assessment of audit risk control. Task complexity is defined in Bonner's (1994) research as a classification of elements consisting of components of a general information processing model, namely input, processing, and output. While Blocher et al. (1986) did not show a definition of task complexity but directly discussed the impact on decision-making performance, when the complexity of the task was interacted with the format of presenting information. When task complexity is low, table presentation is preferred over graphics. Whereas the research of Brazel and Agoglia (2007) identifies a complex accounting information system environment based on technological sophistication and the number of procedures that must be passed.

Mascha and Miller (2010) and Sanusi et al. (2018) support that task complexity does affect decision making process and lead to bias judgment. If complexity is associated with five factors limiting decision making, then complexity falls into the bounded rationality category. As mentioned earlier that in bounded rationality, decision makers are faced with limited information about the definition of the problem. In complex assignments, decision makers find it difficult to capture all information in the environment and the assignments they receive. Especially if the complexity affects the memory of decision makers.

But what needs to be considered about testing the effect of task complexity on bias is the presence of time and cost limitations, the quantity and quality of information, and memory limitations. According to the theory of bounded rationality, these factors together cause a decision bias. Therefore testing the effect of task complexity should include these factors as interaction or moderation.

2. Information Presentation Format

As with the task complexity, information presentation format is also a matter of testing the relatively established decision bias determinants. This is evidenced from researchers who consistently discussed the issue from 1986 to 2011. Blocher et al. (1986) tested the format of information in tabular and graphical form,

to be interacted with task complexity, then seen the effect on the quality of decisions measured by accuracy and precision. Whereas Heinz and White (1989) examine the effect of presenting data compiled with an up/down pattern on decisions. Furthermore Cardinael (2008) as Blocher et al. (1986) tested the effect of table and graphic formats in presenting information on production costs to profitability assessment. Finally, Mastilak (2011) examines how costs classification into cost pools affects the accuracy of individuals' understanding of relations among costs

The results of Blocher et al. (1986) showed that the format of tables and graphics, when interacted with task complexity, affected the quality of decisions. Whereas research by Heinz and White (1989) shows that information compiled in a descending pattern is more considered by decision makers. Cardinael (2008) proves that the table format is more helpful for accountants who have low knowledge to set a high profit target. Mastilak (2011) on the other hand find that there is no significant difference between cost information that presented in different of same cost pool.

Based on the explanation of the causes of bias, information presentation format supports the theory of bounded awareness. The theory states that there is a tendency for decision makers to ignore information that is complicated, present, and clearly visible. The presentation format triggers failure to identify clear warning and important information that is available.

However, to clarify the explanation of the theory, research on the influence of information presentation formats on the quality of decisions must pay attention to other supporting factors. These factors include the clarity of information, the level of awareness of the environment, as well as the position of decision makers. The positions in question comprise individuals, groups, negotiators or bidders in the auction process.

3. Quality and Quantity of Information/Data

There are eleven studies that investigate the effect of quantity and quality of information on decision bias. Heinz and White (1989) examine the effect of information in the form of unaudited data on the analysis of the auditor's review. Whereas Carpenter and Dirsmith (1992) examined the effect of item size, earnings trends, and the nature of transactions on the audit decision-making process. Furthermore, Tucker and Matsumura (1997) investigated the influence of second peer review and sample information on audit report decisions on the condition of auditors who have competence and independence. Eames, et al. (2005) examine the effect of information in the form of recommendations from stock analysts on earnings forecasting decisions. Schultz, et al (2009) test the addition of information on business and other risks in determining the risk of material misstatement.

Mascha and Miller (2010) study the clarity of the information given to auditor to assess the risk in internal control. Lachmann, et al (2011) show that unprofessional investor who get good information will interpret financial statement better than who don't. On the other hand, Chen, et al (2012) state that managers with additional information such as fair value accounting tend to reduce the possibility to hedge risk. Fay, et al. (2015) provide empirical evidence that auditor who aware of prior-year testing strategies focus on generally known high-risk areas and firm standard procedures while planning the audit. Lastly, Wainberg (2018) shows that anecdotal data lead to anecdotal bias.

Various forms of information quality and quantity as identified have been proven to influence decisions. These studies contribute to strengthening the theory of bounded rationality. The quality and quantity of information affects rational decision making, but the problem lies with decision makers who are unable/limited in accessing, assessing and using the information. Thus the addition of quantity and quality of decisions makes decision makers can expand their decision areas so that impacting decision quality improvement.

4. Situation/Environment

Research that identifies the influence of the situation/environment on decision making has been carried out by many researchers. Ganguly et al. (1994) examine the influence of the situation in the form of a competitive market environment against the bias made by traders. While Chatterjee et al. (2000) investigated the impact of outcome changes on decision making. Next Hoffman, et al., (2003) examine the effect of limiting the information process on the auditor to going-concern assessments.

The situation identified by Chang et al. (2008) is transfer pricing. The study examines the impact of transfer pricing on estimated transfer prices when managers are in a loss or gain position. Transfer pricing

in Chang et al. (2008) study depict the event or condition where some manager negotiate and make judgment regarding transfer price. Thus, authors identify transfer pricing as situational determinant for self-serving bias that affect judgment. Furthermore Pathak, et al (2010) examined the process of making audit decisions in specific situations, namely e-commerce. Gramling, et al. (2010) examine the client's internal control situation to determine the level of risk.

Auditor who receive treatment like brainstorming assess fraud risk better than who don't and it is proven through Alon and Dwyer (2010) study. Arel and Cianci (2012) examine how environment where there is strong internal audit function and ethical leadership make accountant get more ethical judgment. Situation such as social consensus from Arnold et al. (2013) is proven to affect decision path. Martinov and Mladenovic (2013) test incorporation of ethical framework in ethical education for first-year accounting students. Finally, Tsunogaya, et al. (2016) and Yen, et al. (2017) examine how environment such as colleague and culture affect our decision making process.

Based on the identification, decision bias determinants categorized as a group of situations, it can be stated that the determinants are related to bounded awareness factors. The situation becomes one source of failure in decision making because decision makers do not pay attention to real environmental changes. This limitation factor necessitates decision makers to make the environment or situation as one of the important considerations in decision making. Therefore, various studies have shown evidence the effect of situation on decision bias.

5. Competency

There are seven studies that investigate the effect of competency on decision quality. Bonner (1994) examines competency as an interaction variable together with task complexity variables to see the effect on decision making performance. The results of this study indicate that competency is an important determinant in decision making. Furthermore Jennings et al. (1998) prove that the ability of judges to assess outcomes influences the hindsight bias in the trial.

Ahlawat (1999) attests the influence of ability to assess evidence in providing opinions on the novelty of audit evidence. The event is getting stronger in group setting. Whereas Brazel and Agoglia (2007) show evidence of the effect of the experts competency in audit process on audit decisions, taking into account the environmental conditions and scope of the audit. Next Cardinael (2008) examines the effect of competency on decisions, by interacting with information formats. The result is that there is a significant interaction between the two with quality of decision. Finally Pathak, et al., (2010) examine the relationship between competencies related to information technology and the quality of audit judgment in e-commerce. The research shows a relationship between the two, but has not yet reached the causality relationship. Lastly, Mascha and Miller (2010) examine how skill affect internal control risk assessments. This study shows that participant who have high skill tend to make exact internal control risk assessments.

Based on the results of the study it can be concluded that competency has an impact on decisions quality. This is in accordance with the identification of factors causing decision bias, namely bounded rationality. Ability is a measure used to identify, process, and use information in accordance with individual goals, in the context of this article is a decision. Therefore, if the individual has better abilities then the decision is also relatively better than individuals with lower ability.

6. Method

There are two studies that show that quality of decisions is determined by method, including the application of second-partner review in auditing (Tucker and Matsumura, 1997) and costing system (Waller et al., 1999). This determinant has similarities with situational factor but method is more of the cause of creation of a situation/condition. The choice to obey the rules on second-partner review or not will have an impact on the situation of the audit work process to influence the decisions made. Likewise, the application of a costing system that turned out to trigger differences in how to determine product prices.

This cause is consistent with the theory of bounded self-interest which states that fairness judgment will be difficult to obtain when someone is required to interact with others (for example in the second partner review method). This will have an impact on the emotion and behavior of decision makers that in turn reduce the quality of decisions produced.

7. Experience

Experience is one of the determinants of decision quality. This was proven through research by Hoffman, et al., (2003) and Schultz, et al. (2009). Both studies examined the impact of experience together with other variables in the decision making model.

Hoffman, et al. (2003) examine the impact of experience together with the condition of limitation to see its effect ongoing concern opinion. Whereas Schultz, et al. (2009) test experience together with knowledge to see its effect on business risk assessment and audit judgment. As in the case with knowledge and limitation, experience is one of the research variables to prove the theory of bounded rationality. Experience influences the workings of rational decision-making mechanisms that always rely on information. Experienced people certainly have advantage both in terms of quantity and quality of information. So that it will have an impact on the quality of decision taken.

8. Personality Trait

Inherent factor such as personality trait has a role that lead to decision-making bias. Two studies point out how personality trait can affect judgment bias. Schauß, et al. (2014) examine functional fixation on BSC users. Students are used as surrogate for BSC users and this study find that BSC users with functional fixation tend to fixated in their judgment and exert more effort in understanding non-financial measures. This fixated judgment is the source of bias in decision making. Meanwhile, Sanusi, et al. (2018) test the mediating effect of self-efficacy on the relationship between goal orientation and audit judgment performance. They find that individuals with high self-efficacy outperform individuals with low self-efficacy. The one with high self-efficacy have more cognitive ability that enable them to have greater performance in audit judgment.

Thus, form the two studies that we reviewed personality traid do have effect on judgment bias. Some personality trait maybe more prone to make bias in individuals judgment and vice versa. In the case where individual have high functional fixation, judgment bias have more probability to occur. Self-efficacy on the other hand is a trait more durable to bias judgment. It can be concluded that personality trait in some ways influence individuals in their decision making process.

9. Motivation

Some researchers examine the influence of motivation on decision making (Baliey, et al., 2005; Moore, et al., 2010; Tsunogaya, et al., 2016). From the review, authors can divide motivation as intrinsic/extrinsic and monetary/non-monetary. Baliey, et al. (2005) examine political trends towards the success of the DIT (Defining Issue Test) test for public accountants. The motivation from this study is categorized as intrinsic motivation because this motivation come from the belief of public accountant. While Moore, et al. (2010) prove that motivation in the form of financial/monetary apparently does not moderate the assessment bias. Furthermore, Tsunogaya, et al. (2016) find that extrinsic motivation is one of the source of bias in decision making. Their study provide empirical evidence that auditor in Japan consider incentive before recommend capitalization of finance lease transaction.

Motivation is more directed towards ethics. Therefore, these studies prove the theory of bounded ethically. Ethics limits motivation if the motivation in question is motivation for profit. Therefore the relationship is opposite to the quality of the decision. But on the other hand, motivation can also strengthen commitment to self-deception through moral considerations in the decision making process. Thus, motivation encourages the improvement of decision quality.

Methodological Issues in Research on Decision Making

The research methodology used by the thirty-four studies examined in this article uses a quantitative approach. Furthermore, the research design uses experiments, except some researches that use survey (Brazel and Agoglia, 2007; Pathak, et al., 2010).

In studies that use experimental designs, almost all researchers use auditors as participants. But some researchers use students as surrogation as conducted by Ganguly et al. (1994), Waller et al. (1999), Eames, et al. (2005), Cardinael (2008), and Chang et al. (2008). In addition, Jennings et al. (1998) used jurors/judges as participants and Carpenter and Dirsmith (1992) used investors and analysts as participants.

There are some issues that yet to be explored in the field of decision making bias. First, authors not find a study that incorporating practitioners and students and test the differences between two groups of

participant in judgment bias field. Future research can discuss this topic with experimental setting. Second, lack of study that investigates means to mitigate judgment bias in decision making. Future research may consider this topic and further explore a way or two in mitigating judgment bias with qualitative or experimental setting. Experimental research can point out some determinant in mitigating judgment bias and in turn qualitative research can investigate the determinant in depth to conclude whether the determinant propose from experiment really mitigate judgment bias. Case study and qualitative research can fill in this gap to give more holistic view of bias in decision making.

4. CONCLUSIONS, SUGGESTIONS AND LIMITATIONS

This article discusses various research issues regarding decision making. There are thirty-four studies published in international journals that are used as sources of analysis. Furthermore, the writer uses the decision limiting theory in conducting the study. In addition, the authors also presents methodological issues in these studies.

The review results of various studies indicate that there are nine groups of determinants of bias that have been identified. The nine groups include complexity of the task, information presentation format, quality and quantity of information/data, situation/environment, competency, method, experience, personality trait and motivation. Furthermore, all determinants are analyzed by referring to factors that limit the decision making process, namely bounded rationality, bounded willpower, bounded self-interest, bounded ethically, and bounded awareness.

The review of bias determinants on decision making context provide theoretical and practical contribution. By presenting methodological issues, future research can gain some gap that can be explored further to enrich the body of literature on judgment bias and decision making context. Practitioner such as managers, accountant or auditor can use this review to consider how to reduce bias in judgment and decision making. Thus, the quality of the decision can be assured because good quality decision lead to good results

This study has several limitations. First, authors only use Science Direct, Emerald, JSTOR, and Google Scholar as journal databases. It is due to easiness and usefulness of the search engine. In addition, authors don't have access in journal databases such as Elsevier, Taylor & Francis, and Ebsco. Future research who has access into journal databases mentioned before can use publication article from that source to supplement the lack of article from this study. Second, this study use a certain range of period (1986 to 2018) to choose publication article. Future research can extend the review period to give more understanding of development of decision making bias research.

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