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Ibn Rushd's response to Ibn Sina and Al-Ghazali's philosophical thoughts on cosmology



Authors:

Taufiqurrahman
Taufiqurrahman¹
R. Yuli Akhmad Hambali²

Affiliations:

¹Department of Aqidah dan Filsafat Islam, Faculty of Ushuluddin, UIN Imam Bonjol Padang, Padang, Indonesia

²Department of Aqidah dan Filsafat Islam, Faculty of Ushuluddin, UIN Sunan Gunung Djati Bandung, Bandung, Indonesia

Corresponding author:

Taufiqurrahman
Taufiqurrahman,
taufiqurrahman@uinib.ac.id

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This study is based on the many cosmological problems in Islam as aspects of thought that receive serious attention. In fact, there are also many polemics of thought that occur amongst Muslim scholars, which can be divided into two main groups: traditionalists and rationalists. The traditionalists, represented by Al-Ghazali and the Ash'ariyah theologians, put forward their cosmological thinking on the principle of God's absolute will, while the rationalists, especially those represented by Avicenna (Ibn Sina), proposed their cosmological thinking based on the theory of emanation from Plotinus in terms of its creation and the concept of a geocentric Ptolameus in terms of its structure. In this conflict of thought between the two groups, Averroes (Ibn Rushd) proposed a cosmological thought different from the two. This study seeks to elaborate on the thought of Ibn Rushd's cosmology which is different from that of Ibn Sina and Al-Ghazali.

Contribution: This research provides a clear understanding of the cosmological thoughts put forward by earlier Muslim thinkers. In particular, it wants to bridge the differences regarding the concept of cosmology as put forward by Ibn Sina and Al-Ghazali and how Ibn Rushd bridges the two.

Keywords: cosmology; emanation; philosophy; rationalists; traditionalists.

Introduction

Cosmology started when man began to wonder, '[w]hat is beyond the horizon and what occurred before the earliest occurrence I can remember?' (Alfvén 1977:1) Cosmology is also concerned with the harmony of the universe (Wikandaru, Lasiyo & Sayuti 2018). Cosmology in this study is defined as a theory about the origin of the universe (Al-Attas 2005; Ellis 2014; Steiner 1996). It has become the belief of Muslims that the universe or nature was created by Allah SWT. However, they disagreed in determining the process. The creation of the universe as it is known is one of the important matters not only in Islamic thought (Islamic Theology, Sufism and Islamic Philosophy) but also in the field of cosmology. In the historical record of Islamic thoughts, this issue has become a subject of sharp polemic amongst Muslim thinkers. This polemic can be observed when Muslim thinkers try to formulate the process of creating the universe. The opinions of these Muslim thinkers are generally divided into two groups: firstly, the traditional group Ash'ariyah, which states that the universe was created out of nothing directly; and secondly, the rationalist Muslim philosophers who believe that the universe was created indirectly by Allah from the existing matter (Chapra 1999; Duhri 2016).

In contrast to the speculative field of Islamic thought, modern cosmology (20th century) tends to conclude that the universe was created from nothing. This concept is based on the results of Hubble's observations in 1929 through his giant binoculars. Hubble saw that the galaxies surrounding the Milky Way were retreating at a proportional rate to their distance from Earth – the farther the greater the speed. The entire universe is expanding. Cosmologists in this regard claim that the previous universe was at a singularity point. Because of the shock of the vacuum and negative gravitational pressure, there was an explosive force that resulted in a very powerful explosion about 15 billion years ago (Chernin 2011). This event became known as the Big Bang.

The cosmological studies of classical Muslim philosophers have basically been carried out by many contemporary scholars. Some of them are Ali Mohammad Bhat's research on 'Philosophical Paradigm of Islamic Cosmology', which examines the origin of the universe in the study of Muslim thinkers. Many theories were put forth by the physicists, philosophers and even religions at large, but Islam has its prime source of information 'Quran' on which Muslim cosmologists build their theories and direct their ideas about the cosmology. A large portion of the Holy Quran

contains such information from first Big Bang to the expansion of the universe, the concept of time, space, creation of heavens and Earth, constellations and extinction of the total canvas of the universe (1) (li 2016). Another study is Hossin Zamaniha's research on 'A Comparative Study on the Theory of Form and Matter and Its Role in Aristotle and Avicenna's Cosmology'. In this study, Zamaniha states that although Avicenna accepts the Aristotelian theory of form and matter, he makes some alterations in this theory and redefines it in a new manner. His theory of form and matter despite its Aristotelian background is mostly influenced by his own metaphysical bases which are originally inspired by the monotheistic spirit of Islamic teachings. As a result, whilst in Aristotelian cosmology the prime matter of the world is eternal and uncreated, Avicenna by making a distinction between temporal eternity and essential eternity of the world rejects the former and accepts the latter (Zamaniha 2019). Similar studies can also be found in Syamsudin Arif's study of 'Divine Emanation as Cosmology: Origin: Ibn Sinā and His Critics'. Ibn Sinā's efforts are to reconcile the Aristotelian doctrine of the eternity of matter with the teaching of al-Qur'an on the One Creator God, resulting in the conclusion that the universe, which comprises a multitude of entities, is generated from a transcendent Being, the One, that is unitary, through the medium of a hierarchy of immaterial substances. Whilst the ultimate source is undiminished, the beings which are emanated are progressively less perfect as they are further removed from the first principle (Arif 2012).

In this study, Ibn Sina, a Muslim thinker, in relation to other studies, elaborated on the cosmology of al-Farabi, which concluded that nature was created from the existing matter. However, Ibn Sina's cosmology was later criticised by Al-Ghazali who concluded that nature was created from nothing. The opinion of these two philosophers received a strong response from Ibn Rushd who stated that the universe was created from something that already existed, with a different structure from that proposed by Ibn Sina. Ibn Rushd's thoughts about the universe that emerged as his critique of the thoughts of Al-Ghazali and Ibn Sina are very interesting. Ibn Rushd's response to Ibn Sina was even more prominent than his response to Al-Ghazali who was considered a philosopher's response to a philosopher. Meanwhile, Ibn Rushd's response to Al-Ghazali is the response of a philosopher to a theologian. Based on this, the main problem to be expressed in this study is the concept of Ibn Rushd's cosmology, and how did Ibn Rushd respond to the cosmological thoughts of Al-Ghazali and Ibn Sina. This comparative study of the thoughts of classical Muslim philosophers about cosmology is important, considering that their thoughts can provide important value for the development of cosmological studies itself, especially by providing an Islamic perspective, and the role of God in the creation of the universe.

The focus of the issue to be examined in this research is, 'what is the significance of the effort to study the cosmological thinking of classical Muslim thinkers, in particular, the

contradiction of the cosmological thoughts of Ibn Sina and Al-Ghazali, and how Ibn Rushd's cosmological thinking can mediate the contradiction between the two?' What is new from this research on the contradiction of cosmological thought between Ibn Sina and Al-Ghazali is the elaboration of Ibn Rushd's thought as an intermediary between the two, which also further explains how Ibn Sina's cosmology should be understood. This is important because readers can postpone their assessment of the thoughts of Muslim philosophers in the past before obtaining a good explanation, so that they do not easily declare these philosophers and their thoughts as heretical thoughts and contrary to Islamic teachings.

Method

The most important objectives to be achieved from this study are, firstly, to reveal and analyse the importance of the discussion of cosmology by Muslim philosophers; and, secondly, to understand and analyse Ibn Rushd's cosmological thoughts and his responses to Al-Ghazali's and Ibn Sina's cosmological thoughts. Ibn Rushd's cosmological thoughts will also be compared with modern cosmological theories. This discussion will later prove the suitability and incompatibility of Ibn Rushd's cosmological thinking with the development of modern science today.

Based on the aforementioned objectives, this study will use library research through analytical and critical methods (eds. Denzin & Lincoln 2000; Moleong 2004). The main sources that are used in this study are books written by the three philosophers, such as the works of Al-Ghazali: amongst them *al-Munqiz min al-Dhalāl*, *Tahāfut al-Falāsifah*; Ibn Sina's works such as *Al-Syifā*, *al-Najāh* and *al-Isyārāt wa al-Tanbihāt*; and the works of Ibn Rushd such as *Fashl al-Maqāl*, *al-Kasyf 'an Manāhij al-'Adillat* and *Tahāfut al-Tahāfut*. Another source that is used as a guide in this study is the work of other thinkers who specifically discuss the cosmological thoughts of these three philosophers. This supporting source can be taken from books, scientific journals and the results of previous studies that are relevant to this study.

This study also cannot be separated from the development of modern cosmological theories. Because of that, various modern cosmological literature (11) will be used as sources and additional reference material in this study. The research steps taken in this study are (1) description of the primary idea that is the focus and object of study, both found from the main source of the study and the supporting sources, (2) discussion and interpretation of primary ideas, (3) critical reading of the primary ideas that have been interpreted, (4) analytical study of a series of primary ideas and (5) summarising the results of the study.

Results and discussion

Ibn Sina and Al-Ghazali: The concept of the creation of the universe

There are differences of opinion between theologians and Muslim philosophers about the meaning of the universe.

Theologians define nature in general as anything other than Allah (Al-Juwainy 1965). Meanwhile, Muslim philosophers defined the universe as a collection of *Jawhar* [substance] composed of *mâddat* [matter] and *shûrat* [forms] that exist on earth and in the sky (*majmû 'al-ajsâm al-thabi'iyat au jawhar al-murakkab min mâddat wa al-shûrat min 'ardh wa samâ'*) (Shaliba 1973).

The focus of the problem in this study, as stated earlier, is the conflict of cosmological thought between Ibn Sina and Al-Ghazali, both of which represent two schools of theological thought in Islam. Ibn Sina represents the rational group and Al-Ghazali represents the traditional school (Ash'ariyah). The difference between the two lies in the explanation of how the universe was created, in which Ibn Sina argued that the universe was created from the existing matter, whilst Al-Ghazali argued that the universe was created from nothing. The contradiction between the two, as will be elaborated further in this research, will be mediated by Ibn Rushd. Although Ibn Rushd is more inclined to Ibn Sina's thoughts, it can also provide a way out of the conflict of thought between Ibn Sina and Al-Ghazali.

Ibn Sina's concept of cosmology, in this case, can be traced from his philosophy of emanation (*al-faydh*). The concept of emanation itself comes from Plotinus (204/5–270 AD). Plotinus' thought inspired and influenced the cosmological building of Ibn Sina (980–1037 AD), also known as *al-Syaikh al-Râis*. According to Ibn Sina, Allah created the universe through the process of emanation, in the sense that Allah bestows natural forms. This emanation occurs through Allah's thought or Allah's *ta'qqul* about his substance as the cause of the existence of this nature. Allah's *ta'qqul* regarding his substance is Allah's knowledge about himself and that knowledge is the power (*al-qudrat*) that creates everything. In order for something to be created, it is sufficient for it to be known by Allah (Aini 2018).

Ibn Sina's intention when proposing this concept of emanation was to avoid a lot in Allah, because Allah could not directly create a nature with many elements. If Allah is directly related to this plural nature, then it means that there are many things (plural) in Allah's *ta'qqul*. This is contrary to the teachings of *tawhid* in Islam. In this context, the systematics of Ibn Sina's emanation can be stated as follows:

Allah The Most Perfect only thinks (*ta'qqul*) about His substance, which is the power, and the thinking power of Allah creates the First Intellect. As Almighty Allah, the First Intellect is also one in number, but it contains much in its meaning. The First Intellect is the second being – Allah as the first being – has three objects of thought: Allah as *wâjib al-wujûd li dzâtihi*, itself (first intellect) as *wâjib al-wujûd bi ghairihi* and itself as *mumkin al-wujûd* (Ibn Sina 1938).

The First Intellect thinks of Allah, who is also the power (*qudrat*), which then manifests the Second Intellect, which then thinks of itself as *wajib al-wujûd bi ghairihi* and

manifests the First Soul. Then think of himself as *mumkin al-wujûd* and manifest the First Heaven. And so on every reason thinks of Allah as the *wâjib al-wujûd* manifesting similar ideas until the Tenth Intellect. This Tenth Intellect no longer manifests a similar kind of intellect, because its power is already weak and only produces the Tenth Soul, the spirit earth, the first matter which forms the basis for the four elements: water, air, fire and earth. When the minds are doing *ta'qqul* about themselves as *wajib al-wujûd bi ghairihi*, the souls are manifested until the Tenth Soul, and when the minds are doing *ta'qqul* about him as *mumkin al-wujûd*, the planets appear – the planets in sequence are First Sky, Stars, Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon and Earth (Sina 1938).

The intellect and the planets in the emanation are basically emanated by Allah hierarchically. This situation can occur because of Allah's *ta'qqul* about his substance (*dzat*) as a source of energy and produces tremendous power.

The fundamental difference between Ibn Sina's emanation and that of Plotinus is that Plotinus sees that this world is just emanating from Allah which impresses Allah as not the Creator and is inactive. This can be captured from Plotinus' metaphor of the sun that shines in describing the emanation process. Meanwhile, Ibn Sina used the emanation process to explain how Allah created the universe. In Islam, Allah is the Creator of the universe (*qath'i al-dalâlah*). This reversal of Allah must be fully believed. For those who deny, it can lead to *kufr*. Therefore, in Islam, Allah is active (*Khâliq: ism fâ'il*), then the metaphor of emanation is like the sun that shines is a misleading metaphor.

Ibn Sina's cosmological thinking resulted in the idea that the universe was created by Allah from the existing matter (*al-ijâd min syai'*), from the energy produced by Allah's *ta'qqul* towards his substance, which then condensed into original matter (*al-hayla al-ûla*), which consists of *al-nâr* [fire], *al-dukhân* [air], *al-mâ'* [water] and *al-thîn* [land] which later became the universe. This view is in line with the philosophical principle, that it is impossible for nothing to turn into existence, because what actually happens is that what exists changes into being in another form (*shûrat*).

Based on the conception of emanation, this nature or universe is *qadim*, because it has been emitted by Allah from the beginning (*qidam*) and *azali*. However, there is a big difference between the *qadim* of Allah and the universe. The difference lies in the causes that created the universe. The universe is *qadim*, because it has no beginning in time (*taqaddum zamâni*). Meanwhile, in terms of essence, because Allah created it in abundance, the universe is new (*hâdist*). Just as Allah is in essence, not in terms of time, then the essence of Allah as Creator is prior to nature as creation (*taqaddum dzâti*). So the universe is both new and *qadim*, new in essence and *qadim* in terms of time, which is also called creation *azali* (*muhdats azali*).

However, Ibn Sina's cosmological thought received harsh criticism from Al-Ghazali. Al-Ghazali even mocked Ibn Sina by saying 'the abundance of intellects from God is delusion, this is a sign that Ibn Sina's mind has been corrupted' (Al-Ghazali 1966). Al-Ghazali then continued:

[I]f the abundance of the universe from Allah is a necessity, as is the abundance of rays from the sun, then this universe will be qadim like the qadim of Allah (pantheism).

In other words, the universe was not created and Allah is not the Creator of the universe. Because nobody would say lights make rays and people make shadows. The person who gives rise to a job will not be called a maker but only the cause of the job. Based on this reason, Al-Ghazali (1960) assessed Ibn Sina as a *kafir zindiq*.

Al-Ghazali also criticised Ibn Sina for his thought that Allah can only think of himself, whilst the intellect (*'aql*) can think of Allah and himself. This view, according to Al-Ghazali, will lead to the conclusion that Allah's abundant intellect is more perfect and more exalted than Allah himself (Averroes 1930). Thus, the idea of emanation cosmology suggests that Ibn Sina no longer glorifies Allah as the most perfect substance. Ibn Sina has considered Allah like a dead being but still knows himself (Al-Ghazali 1966).

Basically, Al-Ghazali's criticism was closely related to the Ash'ariyah theology he believed in. Al-Ghazali could not possibly accept the notion of emanation which was based on rational thinking towards religious understanding, because like other Ash'ariyah theologians, Al-Ghazali's thought was based on the belief in the absolute will and power of Allah.

Based on the brief description above, it can be said that there has been a fundamental difference in views between the two Muslim thinkers. Ibn Sina based his thinking on the rational side of religious cosmology, whilst Al-Ghazali started from the religious empirical side. However, one must be aware of this difference in starting points, to understand that such criticism does not necessarily make one thinker superior to another.

Ibn Sina's concept of emanation, according to Al-Ghazali, will lead to the idea that the nature or universe is *qadim*, negates Allah as the Creator and places Allah as inferior to his creatures and pantheism. Al-Ghazali, like many Muslim theologians, believed that Allah created the nature from nothing into existence (*al-ijad min al-Adam, critio ex nihilo*) based on his *qudrat* and in accordance with his absolute will. Causality, in this case, is not a necessity but only a natural habit. Certainly, Al-Ghazali's view is actually not in accordance with the concept of emanation that Ibn Sina meant. Al-Ghazali's criticism is simply a misinterpretation of Ibn Sina's concept of emanation.

The difference in cosmological thinking between Ibn Sina and Al-Ghazali actually provides an important illustration of how the theme of cosmology has become one of the

main topics of discussion of classical Muslim philosophers. Cosmological studies, in this case, must be seen as studies that have a direct connection with theological studies as the foundation of Islamic intellectuality. There are several verses in the Koran that encourage people to think about nature and the process of nature's creation as signs of God's greatness, such as in Surah Al-Anbiya (30), Al-Nahl (65-66), Al-Kahfi (51), Al-Ghaasyiah (17-20), Saba '(9), Al-Rum (8), and other verses. These verses are a clear signal of the need for the development of cosmological studies in Islam. Therefore, learning from the cosmological thoughts of Ibn Sina and Al-Ghazali, one can understand how hard is the work of classical Muslim thinkers to explain important themes in cosmology, especially regarding the creation of the universe. Through this understanding, people can increase the level of their faith in God and their belief in the teachings of Islam itself.

Ibn Rushd's views and his response to Ibn Sina's and Al-Ghazali's cosmological concepts

Ibn Rushd (Averroes) is a Cordova-born Muslim scholar and philosopher. Dante Aleghieri, the author of *Divine Comedy*, calls Ibn Rushd as the famous commentator of Aristotle (Al-Ahwany 1962). Ibn Rushd, in this case, provides an interesting explanation in response to the cosmology of Ibn Sina and Al-Ghazali. According to Ibn Rushd, there is a mistake in understanding the arguments of *wajib al-wujud* and *mumkin al-wujud* by Ibn Sina. Ibn Sina's mistake, as explained by Ibn Rushd, lies in his opinion about *wajib al-wujud min ghairihi* and *mumkin wujud bidzatih*, where Ibn Sina said that *mumkin al-wujud* requires what is *wajib al-wujud*. According to Ibn Rushd, the concept of *al-wajib* does not have a *mumkin* [contingent] element, because *wajib* is fundamentally different from *mumkin*. However, something that is *wajib* (obligatory, necessary) if seen from a certain point of view may be seen as *mumkin* (contingent) from another perspective (Al-Ahwany, 1962).

The division of *al-maujudat* to *mumkin al-wujud* and *wajib al-wujud*, in the sense that *mumkin* occurs because there is a cause (*'illat*), whilst *wajib* occurs automatically without cause (*'illat*) as stated by Ibn Sina, does not prove the denial of the existence of an infinite cause (*'illat*). Therefore, this infinite cause becomes part of the *maujudat* [nature] which also has no cause. Thus, everything that is included in the *maujudat* will become an element that must exist (*wajib al-wujud*) (Rusyd n.d.).

The concept of *al-mumkin* and *al-wajib* of Ibn Sina, according to Ibn Rushd, is a wrong concept because *al-mumkin fi dzatih* cannot possibly be *wajib (dharuriy)* in terms of its agent (*fa'ilih*). Unless, if the *mumkin* element turns into the *wajib* element (Rusyd n.d.). For this reason, Ibn Rushd accused Ibn Sina of agreeing with the theologians. However, his accusation against Ibn Sina for not adhering to the rational method still needs to be questioned because Ibn Sina has used a rational method, for example, in his book: *Al-Mantiqiyat bain al-Thâriq al-Burhâny al-Falasafy wa al-Thâriq*

al-Jadaly al-Kalâmy. In his work, Ibn Sina actually uses the philosophical demonstrative method (*al-burhân al-falsafiy*).

The basis for Ibn Rushd's accusation against Ibn Sina was actually more because Ibn Rushd agreed with Aristotle's view, which did not use the concepts of *al-mumkin* and *al-wâjib*. However, when we examine the potential and actual concepts proposed by Aristotle, there is a kind of similarity between the two as well as differences.

Ibn Rushd emphatically rejects Ibn Sina's emanationism. According to Ibn Rushd, Ibn Sina's thinking has several weaknesses, difficulties and conflicts, including the following.

Firstly, the opinion of Ibn Sina that from *al-fâ'il al-awwal* only emits one, contrary to his own opinion, that what emanates from the first one there are many in him, whereas from one must emit one. This idea is acceptable, according to Ibn Rushd, if only he said that there is much in the first effect (*al-ma'lûl al-awwal*) and each of the many is the first. But this is not possible, as it would force him to say that the former is a lot (Halim 2016; Rusyd 1971).

Secondly, because of Ibn Sina's lack of thoroughness, this thought was followed by many people, then they attributed it to philosophers, in this case Aristotle, although he did not think so. Furthermore, Ibn Rushd said that this thought is an illusion and a form of belief that is much weaker than the opinion of the theologians (*mutakallimun*), and it is not in line with the principles of the philosophers, and cannot even give satisfaction to the *khitâbi*. Therefore, Ibn Rushd said that it is most appropriate to assume in *ma'lûl awwal* there are many and many must be one (Rusyd 1971). Thus, this unity requires that the many return to the one and the one who created the many to be one, and it has a simple meaning and arises from one simple one: Allah.

Thirdly, according to Ibn Rushd, the principles (*al-mabâdi'*) that emanate from other principles as stated are something that were not known to previous philosophers. Because they mean that the principles have a certain state from the first principle, where these principles are not perfect without that *maqâm*. The correlation between these principles requires consequences (*ma'lûlât*) to each other, especially from the first principle. Thus, what is meant by *fâ'il*, *ma'f'ûl* and *makhluq* is in the above meaning, as there is a relationship between each person and the One (Rusyd 1971):

1. Ibn Rushd also asked the question, how to explain the existence of the universe from One (Allah). Ibn Rushd says that there are three opinions to answer this question: firstly, the source of the many is *al-hayûlâ* or *al-isti'dadat* (first material); secondly, the source of the many is *al-'âlat*; and thirdly, the source of the many is *al-mutawassithat* (mediator). Therefore, in Ibn Rushd's efforts to avoid emanation, he said that the many arises from three sets of causes, namely, *al-isti'dadat*, *al-'âlat* and *al-Mutawassithat*. Three sets of causes belong to the one and return to the one, because the existence of each in a pure unity is the cause of the many (Rusyd 1971).

Furthermore, Ibn Rushd distinguished between *al-'âlam al-uluwwy* and *al-'âlam al-sufla*. According to him, humans can know *al-'âlam al-uluwwy* by observing the four elements: water, air, fire and earth. If all of these elements can be observed and understood well, then humans may continue towards the Most High (Allah) as a potential Creator (*bi al-quwwat*) into an actual form (*bi al-fi'l*), without forcing themselves to adhere to emanation and 10 intellects (Al-Iraqy 1980).

The natural philosophy within Ibn Rushd's thought

Based on the division of nature into *al-sufla* and *al-uluwwy*, the existence of four elements and the existence of two forms of reason, both potential and actual reasons, as stated by Ibn Rushd, it can be presumed that this kind of thinking came from Aristotle. If this is the case, then Ibn Rushd has been able to describe the many (nature) relationships with the One (Allah) without having to rely on the philosophy of emanation or 10 intellects. Thus, the accusation that Ibn Rushd's *takwil* in this matter refers to Plotinus is a false accusation. His criticism of his predecessors, his inclination towards Aristotle's philosophy and his admission of the necessary relationship between the diversity of being, both in heaven and on earth, and the arrival of this diversity at a conclusion that it is he who gives the bonds is the one who gives *wujûd*. This shows that Ibn Rushd's thinking differs greatly from that of Plotinus.

The difference in ideas between Ibn Rushd and emanates, such as Ibn Sina, is as follows:

1. Ibn Sina in proposing Aristotle's philosophy did not take it directly from it but through a second source. This makes his attempts to apply Aristotle's thought inaccurate, which is in contrast to Ibn Rushd who directly took these teachings from Aristotle or *al-Mu'alim al-Awwal*.
2. Ibn Sina was influenced by theological premises, whereas Ibn Rushd adhered to *burhani* premises.

However, Ibn Rushd also criticised Al-Ghazali's opinion that nature was created from nothing. According to Ibn Rushd, there is no verse in the Quran which explains that nature was created from nothing. On the contrary, nature was created from something that already existed. If so, then Al-Ghazali took the *majazi* meaning of the verses and Ibn Sina took the *lafzy* meaning of the verses. This means, according to Al-Ghazali's thinking, when Allah created nature, there was only Allah himself and nothing but him. Meanwhile, according to Ibn Sina's thinking, when Allah created nature, there was already something and from that something Allah created nature.

To support his opinion, Ibn Rushd put forward a number of verses from the Quran: surah *Al-Anbiya'* /21:30, *Hud* /11:7, *Fushilat* /41:11 and *Al-Mu'minun* /23:12-14. These verses basically explain that before nature was created, there was something else: water and steam. Thus, said Ibn Rushd, Ibn Sina's opinion is in accordance with the sound of the verse,

whilst Al-Ghazali's opinion is not in accordance with the meaning of the verse (Rusyd 1971).

According to Ibn Rushd, there is a difference in thought between Ibn Sina and Al-Ghazali in this case because of the differences in opinion in interpreting the word of *al-ihdâts* and *qadim*. For Al-Ghazali, *al-ihdâts* means creating from nothing; whilst for Ibn Sina, the word means manifesting from being to being in another form (Rusyd 1971). Likewise, in interpreting the meaning of *qadim*, for Al-Ghazali, *qadim* means something that has a form without cause, whilst for Ibn Sina, *qadim* means something that happens in a continuous state without beginning and without end (Rusyd 1971).

Although Ibn Rushd agrees with Ibn Sina that nature was created from the existing matter, they differ in their opinions in determining that matter. According to Ibn Sina, this material is energy from the results of Allah's *ta'addul* towards his substance. Meanwhile, according to Ibn Rushd, the material is *al-mâ'* and *al-dukhân*.

Ibn Rushd in this case establishes the evidence for the existence of God differently from both Ibn Sina and Al-Ghazali. Ibn Rushd chose the path that was simpler, easier and more faith driven. This difference is motivated by two reasons. Firstly, the proposition about the novelty of nature that is often used by theologians is not the religious proposition offered by Allah in the Quran, because the argument still contains various doubts that are difficult to resolve dialectically. Secondly, the arguments of *wajib* and *mumkin* offered by Ibn Sina are only suitable for certain circles and are not suitable for ordinary people. Because of that, Ibn Rushd in his book, *al-Kasf 'an Manahij al-'Adillat*, explains that we can establish the existence of Allah in three ways:

1. The argument of *inayah al-ilahi*: This argument is based on the belief about the purpose of everything, which is based on two principles: firstly, everything in this world is in accordance with human needs. Secondly, this conformity must have come from a Creator who had willed it so, because it is impossible for such a coincidence to occur. Therefore, said Ibn Rushd, anyone who wants to know God is obliged to study the benefits of everything in nature.
2. The *Ikhtirâ'* argument: This argument is based on the phenomenon of the creation of all creatures, such as inanimate life and various types of animals, plants and so on. By observing inanimate objects or living things in nature, people will realize that there is a creator (God). Likewise, the various stars in the sky are completely subject to Allah's provisions. These are all evidence of a creator. Therefore, anyone who wants to know Allah in truth is obliged to know the essence of everything in nature, so that he can know all of these realities.
3. The motion argument: This proposition comes from Aristotle and Ibn Rushd sees it as a convincing proposition in proving the existence of God. The motion

is not fixed in a state but is always changing, and all types of motion will eventually end up in the first mover which does not move at all. It is impossible for nature to be a driving force for itself, because there is a force that moves the nature or universe. The mover must be *qadim* and *azali*. If not, then this mover cannot be called the original first mover (Allah SWT).

Nature, according to Ibn Rushd, was created from something that already exists, from *al-mâ'* and *al-dukhân*, as previously explained. From these two materials, nature was created. The creation of this nature according to Ibn Rushd has been ongoing since eternal. So creation does not mean *ibdâ'*, which connotes the creation from nothing, but creation means *îjad* which connotes the creation of something that has existed since eternal life. Therefore, according to Ibn Rushd, nature has always been in the process of forming continuously since the beginning.

The process of creating the universe in modern cosmology basically refers to the Big Bang theory. The first cosmologist to formulate this theory was Georges Lemaitre (1894–1966), a Belgian physicist, in 1927. According to the Big Bang theory, the universe was previously packed in a singularity which then exploded about 15 billion years ago, breaking into pieces with tremendous power (Gribbin 1986). This fragment will later become atoms, stars and galaxies. Because of the expansion of the universe as a result of this big explosion, the galaxies are moving away from each other and will continue to move. This view was further strengthened by the observations made by Arno Penzias (born 1933), a Jewish astronomer, and Robert Wilson (born 1936), an American physicist – winner of the 1978 Nobel Prize. The results of observations made by the two in 1964 revealed the existence of microwaves coming to Earth from all over the universe as a lingering effect of the Big Bang event. Bob Dicke (born 1916), an American physicist, also discovered that similar radiation waves could appear as flashes from the Big Bang (Gribbin 1986). The legacy of the Big Bang can be detected through microwave radiation at a temperature of 3 °K (-270 °C) which has so far flooded the cosmos (Dicke 1967; Peebles 2017).

The results of modern scientific research show that the universe was created from nothing. According to Baiquni, this condition occurs as a shock to the vacuum which makes it contain very high energy in a singularity with negative pressure. This vacuum, which has an enormous energy content and negative gravitational pressure, causes an explosive urge to escape from the singularity. Therefore, the conclusion of modern science is undeniable, no energy, no matter, no space and no time (Baiquni 1994). When there is a very great explosion, like a fireball, energy, matter and space-time come out with tremendous force and with a very high temperature and density. Under these conditions, molecules, atoms, nuclei, protons and neutrons cannot appear because they will melt down into sub-nuclear particles.

When the universe began to cool itself, mainly because of its superfast expansion, the temperature dropped past 1000 trillion-trillion degrees and then after 10–35 seconds, there were symptoms of ‘over-cold’, in which a process of condensation occurred in nature. In the process of condensation, matter comes out in the form of energy which heats nature back to 1000 trillion-trillion degrees. But the whole universe was pushed to enlarge at an incredible speed over a period of 10–32 s. This extraordinarily fast expansion gave the impression that the universe was inflated with a violent blow, which is known as a symptom of inflation.

Thus, the cosmological thinking offered by Ibn Rushd is basically not in line with the conclusions of the cosmological studies which argue that nature was created from nothing. Meanwhile, the original matter of the universe mentioned by Ibn Rushd, *al-mâ'* and *al-dukhân*, according to cosmologists is not the original material of the universe. However, modern science also shows that in the process of its creation, the universe was once in the form of *al-mâ'* [cosmic soup] and *al-dukhân* [condensation].

Conclusion

Based on the previous description, Ibn Sina's cosmological thinking is a representation of many rational Muslim thinkers at that time who believed that the universe was created from the existing matter. Meanwhile, Al-Ghazali represented a traditional group that believed that the universe was created from nothing. The way both of them elaborated on the theme of creation itself was actually quite interesting, given the limitations of supporting tools for scientific work at that time.

In developing his cosmological thinking, Ibn Rushd tends to revive Aristotle's school, which states that the universe was created from matter that has existed continuously from inception to infinity. However, Ibn Rushd's cosmological thinking turned out to be inconsistent with the cosmological findings of modern science which stated that the universe was created from nothing. Meanwhile, the original matter of the universe mentioned by Ibn Rushd, *al-mâ'* and *al-dukhân*, according to cosmologists is not the original material of the universe. However, contemporary cosmological studies show us that the universe originally took shape in the form of cosmic soup (*al-mâ'*) and condensation (*al-dukhân*).

The contradiction of cosmological thought between Ibn Sina and Al-Ghazali, which was later mediated by Ibn Rushd, provides an important lesson that cosmological studies must continue to be developed, not only in the context of developing science (cosmology), but also in order to strengthen religious faith (theology).

Recommendation

This study suggests that Muslims should be active in conducting research on other Islamic intellectual heritage.

The polemic that occurred between Ibn Sina's cosmological thoughts and Al-Ghazali's cosmological thoughts, especially regarding the creation of the universe, in which Ibn Rushd gave a new interpretation or a middle ground between the two, shows the intellectual dynamics of Muslim thinkers across the ages. This intellectual heritage or legacy can be used as a source of inspiration in achieving various advances. On the other hand, it is also necessary to complement the library books of Islamic philosophers to make it easier to conduct research in this field.

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