

Perceived Transaction Costs of Hijri Calendar Fragmentation: Qualitative Evidence from Indonesian Business Actors and Consumers

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ABSTRACT

Purpose – This study explores how business actors and consumers in Indonesia perceive the temporal uncertainty arising from Hijri calendar fragmentation, and how they evaluate the Global Unified Hijri Calendar (GUHC) as one possible institutional response among several. The everyday economic dimension of this persistent divergence over Ramadan and Eid al-Fitr has received little attention in a literature dominated by fiqh and astronomy.

Design/methodology/approach – A qualitative design combined phenomenologically informed interviewing with framework-guided thematic analysis. Fifteen participants were purposively recruited in South Sulawesi (Makassar, Gowa, Maros, and Pangkep): twelve business actors from the transportation, retail, and logistics sectors and three household consumers. Meaning units were coded inductively and then organised against the categories of Transaction Cost Economics (TCE), with *maslahah* serving as an interpretive lens.

Findings – Participants reported three interrelated categories of perceived transaction costs: information, coordination, and adjustment costs. Within this small sample, transportation participants most often described rescheduling burdens, retail participants demand-timing uncertainty, and logistics participants distribution disruption; these are sample-level patterns, not statistically established sectoral differences. Adaptive strategies appeared to redistribute, rather than remove, the uncertainty described.

Originality/Value – The study offers early qualitative evidence linking lived experience of calendar fragmentation to an institutional-economic vocabulary, providing an exploratory basis for further research on the GUHC as a candidate, though not empirically validated, institutional response.

ARTICLE INFO

Keywords:

Global Unified Hijri Calendar;
Hijri Calendar;
Islamic Economics;
Maslahah;
Transaction Cost Economics.

Article Information:

Received: 09/06/2026

Revise: 13/08/2026

Accepted: 11/09/2026

ISSN:

2985-3168 (Online)

2985-3222 (Print)

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1. Introduction

The determination of the Islamic Hijri calendar remains a recurring point of contention among Muslims, both nationally and globally. Differences between rukyat (direct lunar observation) and hisab (astronomical calculation) continue to produce variation in the announced dates of Ramadan, Eid al-Fitr, and Eid al-Adha (Marwadi et al., 2023). In Indonesia, this is compounded by a plurality of religious authorities principally the Ministry of Religious Affairs and large organisations such as Muhammadiyah each applying its own methodological criteria (Marwadi, Labib, & Zain, 2025).

This divergence is often treated as a theological or technical dispute, yet its consequences plausibly extend into economic life as well. Modern economic systems depend on temporal certainty, synchronisation, and efficient coordination, particularly in sectors such as transportation, logistics, and retail. When an official decision on the timing of a religious holiday is announced only shortly before the event, businesses may face disrupted operational planning, last-minute schedule changes, and avoidable costs a proposition this study examines empirically rather than assumes on the strength of the fiqh- and astronomy-focused literature reviewed below (e.g., Amrin, Fajri, Suherman, Fitriyah, & Amelia, 2026; Sari, Taman, & Driss, 2026).

The existing literature on the Hijri calendar is dominated by fiqh and astronomical perspectives: the former centred on the legitimacy of rukyat versus hisab, the latter on the accuracy of lunar-position calculations and hilal visibility (Mohd Nawawi, Faid, Mohd Saadon, Abdul Wahab, & Ahmad, 2024). Both are indispensable to understanding the normative and technical dimensions of the debate, but few studies systematically examine how the resulting uncertainty is experienced by the economic actors who must plan around it. From an institutional-economics standpoint, divergent time-determination systems can plausibly be understood as a source of uncertainty that generates transaction costs — the information, coordination, and adjustment costs that economic actors bear in responding to unpredictable temporal change (Celtekliligil, 2020; (Marneffe, Bielen, & Vereeck, 2019). This is the proposition the present study examines empirically, rather than assumes: calendar fragmentation is treated here as a phenomenon whose economic dimension merits direct investigation rather than one whose costs can be asserted in advance.

Three illustrative cases from the Indonesian context motivate this inquiry. In transportation, airlines and travel agencies routinely face uncertainty in planning the seasonal peak of the homeward migration (mudik) (Akbar et al., 2024; Marwadi, Labib, & Zain, 2025). In retail, uncertainty about the timing of Ramadan and Eid can affect inventory and sales planning. In logistics and distribution, differences in holiday timing across regions may disrupt supply-chain synchronisation. These are plausibilities drawn from the wider literature and from preliminary observation, and the present study was designed to examine whether, and how, business actors and consumers themselves describe such effects, rather than to confirm them in advance.

Despite this plausible economic dimension, three gaps remain under-addressed in the literature. First, prior work on Hijri calendar governance in Indonesia has focused on the fragmentation of religious authority itself (Rosidi et al., 2021) or on jurisprudential and astronomical routes to unification (Amrin et al., 2026; Hashim, Abdul Wahab, Mohd Nawawi, Ahmad, & Faid, 2025), rather than on how the resulting uncertainty is experienced by

economic actors. Second, national and sub-national institutional responses short of global unification such as harmonised national criteria, earlier announcement deadlines, coordinated contingency protocols among transport and retail associations, or shared regional forecasting have not been systematically considered as alternatives to the proposed Global Unified Hijri Calendar (GUHC), even though such measures are, in principle, more incremental and may be easier to implement. Third, the perspectives of consumers, who absorb calendar uncertainty in their own purchasing and travel decisions, are rarely examined alongside those of business actors, despite forming part of the same transaction chain. This study addresses these gaps empirically and qualitatively, without presupposing that the GUHC is the necessary or superior response.

Building on this gap, the present study examines how Indonesian business actors and consumers describe and interpret temporal uncertainty arising from Hijri calendar fragmentation, and how they evaluate possible institutional responses, including the GUHC. The analysis draws on Transaction Cost Economics (TCE) as an interpretive lens and integrates the Islamic economic concept of *maslahah* as a normative framework for considering the welfare implications of religious-time governance (Kuzmin & Suvorova, 2023; Murtadho et al., 2025). Specifically, the study addresses three research questions: (RQ1) How do business actors and consumers in the transportation, retail, and logistics sectors experience and describe temporal uncertainty associated with Hijri calendar determination? (RQ2) What forms of perceived transaction costs emerge from these accounts, and how are they distributed across information, coordination, and adjustment activities? (RQ3) How do participants themselves evaluate possible institutional responses to this uncertainty, including but not limited to a more unified calendar system? In answering these questions, the study offers an empirical contribution documenting perceived costs associated with temporal uncertainty in participants' own words and a modest theoretical one, connecting religious temporal governance, institutional economics, and the principles of *maqasid al-shariah*, while explicitly distinguishing what the data can support from the broader normative case for calendar unification.

2. Literature Review

2.1 The Hijri Calendar Between *Rukyat* and *Hisab*

Scholarship on the Hijri calendar has long been dominated by *fiqh* and astronomy. The central methodological debate *rukyat* versus *hisab* is not merely technical but epistemological, reflecting different understandings of legitimate religious authority. *Rukyat*, grounded in direct observation, ties textual *hadith* tradition to empirical confirmation of the *hila*, whereas *hisab* relies on scientific calculation to determine lunar position with greater predictability (Alamsyah et al., 2026). In practice, the two methods frequently diverge, especially in determining the start of Ramadan and Shawwal, feeding into a broader debate between a single unified Hijri calendar and locally determined calendars tied to national or regional religious authorities. Proponents of a global calendar argue that unification strengthens the unity of the *ummah* and provides certainty for worship and socio-economic activity; proponents of local determination emphasise the legitimacy of geographic context and local religious authority as part of the diversity of interpretation within Islam (Marwadi, Labib, & Zain, 2025). This debate remains unresolved and has, if anything, become more complex as

technological capability has advanced alongside diverging institutional interests across countries.

إِنَّ عِدَّةَ الشُّهُورِ عِنْدَ اللَّهِ اثْنَا عَشَرَ شَهْرًا فِي كِتَابِ اللَّهِ يَوْمَ خَلَقَ السَّمَوَاتِ وَالْأَرْضَ مِنْهَا أَرْبَعَةٌ حُرُمٌ ۚ ذَٰلِكَ الدِّينُ الْقَيِّمُ

"Indeed, the number of months with Allah is twelve months in the register of Allah [from] the day He created the heavens and the earth; of these, four are sacred. That is the correct religion..." (QS. At-Tawbah [9]:36)

This verse establishes the twelve-month lunar cycle as the foundation of Islamic timekeeping. Yet although the literature on the Hijri calendar is rich in normative and technical detail, it has largely treated calendar determination as a fiqh or astronomical issue, leaving its socio-economic dimension comparatively unexamined the gap this study aims to address empirically.

In Islamic economics, the Hijri calendar is not merely a system for scheduling worship; it is part of the institutional infrastructure that shapes the social and economic life of the ummah. Time carries a strong normative dimension in Islam tied directly to fasting, zakat, and hajj but in modern society it also performs a functional role in coordinating economic activity, resource allocation, and production–consumption planning. Islamic economics places welfare (maslahah) at the centre of economic activity (Al-Daghistani, 2023; Choudhury, Hossain, & Mohammad, 2019; Kasim, Abbas, Adhha, & Mutmainnah, 2024), and within the maqasid al-shariah framework, the protection of wealth (hifz al-mal) is commonly associated with efficiency, stability, and sustainability. A time-determination system, including the Hijri calendar, should therefore in principle support certainty and coordination; whether fragmentation in practice undermines this objective, and how strongly, is the empirical question this study investigates.

2.2 Rukyat versus Hisab: An Islamic-Economic Reading

Beyond its theological and astronomical dimensions, the rukyat–hisab debate can be read through an Islamic-economic lens as two systems of time determination with different implications for certainty and coordination. Rukyat, dependent on empirical conditions such as weather and lunar visibility, carries relatively high uncertainty because confirmation is only possible after observation, constraining short-term planning in time-sensitive sectors such as transportation, trade, and logistics. Hisab, by contrast, offers greater predictability because lunar position can be calculated well in advance, potentially allowing economic actors to plan operations, distribution, and resource allocation in a more structured way (Marwadi, Niswah, Zain, Meidina, & Kafi, 2025).

Within the maslahah framework, particularly hifz al-mal, a system that provides greater temporal certainty could plausibly lower the additional costs borne by economic actors, whereas an uncertainty-generating system could raise information, coordination, and adjustment costs (Choudhury et al., 2019). Yet Islamic economics does not evaluate a system on efficiency grounds alone; normative legitimacy and conformity with shariah principles remain equally relevant. The rukyat–hisab debate should therefore not be reduced to a simple trade-off between efficiency and uncertainty, but understood as an ongoing effort to balance religious validity against the practical need for effective economic coordination.

2.3 Global versus Local Determination and Its Economic Implications

The debate between a single global Hijri calendar and locally determined calendars is central to contemporary discourse on Islamic temporal governance. The global approach proposes one calendar system applied uniformly worldwide; the local approach maintains that month determination should reflect local geographic conditions and religious authority, treating resulting differences as a natural consequence of interpretive diversity.

Economically, a standardised and long-predictable global calendar has plausible efficiency advantages: businesses could plan production, distribution, and marketing more accurately, and cross-regional coordination could become easier, a point also advanced in the Indonesian literature on calendar unification (Mufid, 2020). Local determination, by generating temporal variation, may create the kind of uncertainty that leads economic actors to incur additional information, coordination, and adjustment costs in institutional-economic terms, higher transaction costs arising from the absence of a uniform time standard. It is important to note, however, that global unification is not the only institutional route to reducing this variation: national harmonisation of criteria, earlier and firmer announcement deadlines, coordinated contingency protocols among industry associations, and shared regional forecasting are all, in principle, less extensive reforms capable of reducing the same uncertainty without requiring global agreement.

At the same time, evaluating these approaches solely on efficiency grounds would be incomplete from an Islamic-economic perspective; normative legitimacy matters equally. Local determination preserves religious authority and interpretive diversity as part of Islam's intellectual tradition, while the global approach may offer greater efficiency and certainty at the cost of that diversity. Durable institutional outcomes elsewhere often depend on polycentric arrangements that balance local autonomy with overarching shared rules, a tension plausibly analogous to the global–local debate examined here. The global–local debate thus reflects a genuine trade-off between normative legitimacy and economic efficiency, and its resolution requires an integrative approach one that is religiously valid while economically sound, and one that this study's qualitative evidence can inform but not, on its own, resolve.

2.4 Maslahah, Maqasid al-Shariah, and the GUHC as One Possible Institutional Response

Maslahah in Islamic economics is the normative foundation for collective welfare through the protection of the five objectives of shariah (maqasid al-shariah): religion (hifz al-din), life (hifz al-nafs), intellect (hifz al-'aql), lineage (hifz al-nasl), and wealth (hifz al-mal) (Zahirah & Suhaedi, 2025). Within this framework, the Hijri calendar is not simply an instrument for scheduling worship but part of the institutional structure that shapes the level of maslahah achieved in social and economic life.

هُوَ الَّذِي جَعَلَ الشَّمْسُ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ لِتَعْلَمُوا عَدَدَ السِّنِّينَ وَالْجِسَابَ ۗ مَا خَلَقَ اللَّهُ ذَلِكَ إِلَّا بِالْحَقِّ

"It is He who made the sun a shining light and the moon a derived light and determined for it phases – that you may know the number of years and account [of time]..." (QS. Yunus [10]:5)

The idea of the GUHC has been proposed, among other responses, partly in reaction to this fragmentation. From the perspective of hifz al-mal, standardisation could offer a predictable, uniform system that supports coordinated planning of production, distribution, and consumption, potentially reducing temporal uncertainty and the transaction costs associated with it. From the perspective of hifz al-din, calendar unification could also strengthen the

collective observance of worship across the ummah; and from the perspective of *hifz al-'aql*, a globally coordinated calendar grounded in scientific calculation could reflect the productive use of reason in service of religious practice. These are normative possibilities that the *maslahah* framework makes visible; this study's interview evidence, discussed in Section 4, speaks to how strongly participants themselves perceive these possibilities, not to whether a GUHC is in fact the superior mechanism for realising them relative to less extensive reforms.

Any such reform, however, must be pursued inclusively and dialogically, respecting the methodological diversity within the Islamic tradition; *maslahah* is judged not only by outcome but by process and conformity with *shariah* principles. A GUHC's success therefore depends less on its technical design than on its capacity to balance certainty and efficiency with normative legitimacy, collective acceptance, and a realistic accounting of transition costs — considerations this study's participants did not directly address and which remain outside its scope.

2.5 A Welfare Perspective on Institutional Responses to Calendar Fragmentation

Welfare (*falah*) in Islamic economics is not confined to material dimensions; it also encompasses spiritual, social, and institutional dimensions that together support a balanced and just life ([Kismawadi, Haron, & Ruslan, 2026](#)). Any institution that shapes collective life including the Hijri calendar can therefore be evaluated by its contribution to collective welfare. A more predictable calendar system, whether achieved globally or through more modest national and regional coordination, is best understood as one type of institutional mechanism that could support welfare by creating greater temporal certainty; standardised timing could give economic actors a firmer basis for planning ([Jatmiko & Azizon, 2021](#)). A further, non-economic dimension is social cohesion: uniform timing of worship could strengthen solidarity among Muslims, itself an important welfare component, since economic action is embedded in social relationships of trust ([Al-Daghistani, 2023](#)). As with the *maqasid* discussion above, this welfare potential cannot be separated from questions of normative legitimacy and implementation cost; a given reform's net contribution to *falah* depends on integrating economic efficiency with religious acceptance and feasibility, a balance this study does not itself adjudicate.

2.6 Transaction Cost Economics and Religious Time Governance

Transaction Cost Economics (TCE) holds that economic activity involves not only production costs but also transaction costs the costs of exchange, coordination, and decision-making under uncertainty ([Celtekligil, 2020](#)). These are conventionally disaggregated into information costs, incurred in searching for and verifying relevant facts before a decision can be made ([Marneffe et al., 2019](#)), coordination and negotiation costs, and adjustment costs arising from complexity and unpredictability. Within TCE, uncertainty is a core determinant of transaction-cost magnitude: when economic actors cannot accurately predict future conditions, they incur additional costs to hedge risk, anticipate contingencies, and preserve operational flexibility. TCE is one of several formal theories of firm and market organisation that address coordination under incomplete information, alongside property-rights and incomplete-contracting accounts; the present study draws specifically on the TCE tradition because its cost taxonomy maps closely onto the categories of expenditure that informants themselves described.

Applied to the Hijri calendar system in Indonesia, divergent determination of the start of a religious month can plausibly be understood as a source of institutional uncertainty. When decisions diverge, economic actors may need to wait for confirmation, monitor multiple information sources, and adjust operational plans, raising transaction costs as coordination becomes more complex. A more standardised time system, whether global or national, represents in TCE terms an attempt to reduce these costs by increasing predictability, consistent with what [McManus \(2023\)](#) terms hybrid governance arrangements designed to economise on coordination under uncertainty, and with [Abdul-Aziz and Ahmad Zaini's \(2022\)](#) account of institutions as durable, rule-based systems that structure economic behaviour.

From a general accounting perspective offered here as a conceptual mapping rather than as an empirical claim about the specific firms in this study, since no financial statements, accounting records, or cost-classification documents were analysed these dynamics have a plausible bearing on firm-level financial performance. Information costs are typically recorded as administrative or general expenses, reflecting monitoring, coordination with authorities, and scenario analysis undertaken to anticipate possible schedule changes. Coordination costs may manifest as additional labour costs (including overtime) and communication expenses associated with renegotiating schedules with employees, partners, and customers. Adjustment costs may appear as rescheduling expenses, customer refunds, and capacity adjustments following sudden decisions. These are standard accounting categories drawn from the literature cited above, presented here as conceptual possibilities consistent with participants' accounts rather than as findings derived from firm-level financial data collected in this study.

3. Methodology

This study employs phenomenologically informed interviewing with framework-guided thematic analysis ([Sekar & Bhuvaneswari, 2024](#); [Umar et al., 2021](#)) to understand, in depth, how business actors subjectively experience uncertainty in Hijri calendar determination and how that uncertainty shapes their economic behaviour. Phenomenology was chosen because the inquiry concerns not only objective facts but the meaning informants themselves attach to their experience of calendar fragmentation in day-to-day business practice specifically, how uncertainty surrounding the start of Ramadan, Eid al-Fitr, and related dates is felt, interpreted, and responded to, and how that experience shapes economic decision-making and operating-cost structures ([Wang et al., 2021](#)).

3.1 Participants and Sampling

Fifteen participants — twelve business actors and three consumers were selected through purposive sampling. All participant profiles reported in Table 1 correspond to these fifteen actual interview participants; no simulated or fictitious data were used at any stage of data collection, analysis, or reporting. One participant (IN-14), a small-scale entrepreneur by primary occupation, was interviewed and is analysed here in her capacity as a household consumer regarding her own Ramadan/Eid purchasing decisions rather than in a business capacity, and is classified as a consumer throughout this manuscript on that basis. Participants were recruited across South Sulawesi, Indonesia, including Makassar, Gowa, Maros, and Pangkep, through business associations, professional networks, and community referrals. Saturation was monitored throughout data collection: after each interview, newly emerging codes were logged and compared against the existing coding framework, and saturation was

judged to have been reached when the thirteenth interview produced no codes or sub-themes beyond this framework. This determination was made jointly by the first and second authors through a comparison of the evolving coding memos after each interview. Two additional interviews (the fourteenth and fifteenth) likewise yielded no substantively new information, reinforcing the saturation judgement.

Table 1. Profile of Participants (N = 15)

Code	Sector	Role	Experience	Location
IN-01	Transportation	Owner, intercity travel agency	12 years	Makassar
IN-02	Retail	Staple-goods store owner	8 years	Makassar
IN-03	Retail	Muslim clothing trader	6 years	Makassar
IN-04	Consumer	Household shopper	—	Makassar
IN-05	Retail	Dry cake producer	9 years	Makassar
IN-06	Consumer	Private employee	—	Gowa
IN-07	Transportation	Bus operations supervisor	11 years	Maros
IN-08	Transportation	Ticketing coordinator	5 years	Makassar
IN-09	Logistics	Warehouse supervisor	10 years	Makassar
IN-10	Logistics	Courier branch coordinator	7 years	Gowa
IN-11	Retail	Grocery wholesaler	13 years	Pangkep
IN-12	Retail	Food & beverage retailer	4 years	Maros
IN-13	Logistics	Distribution planner	8 years	Makassar
IN-14	Consumer	Small entrepreneur (interviewed as a household consumer)	—	Makassar
IN-15	Transportation	Fleet dispatcher	9 years	Gowa

3.2 Data collection

Data were collected between February and April 2026. Participants were recruited through business associations (6), professional networks (5), and community referrals (4). Eleven interviews were conducted face-to-face at participants' workplaces, while four were conducted via Zoom. Interviews lasted 42–68 minutes (average 54 minutes), were conducted primarily in Bahasa Indonesia, audio-recorded with consent, transcribed verbatim, anonymised, securely stored, and translated into English through researcher verification. Representative questions covered experiences of Ramadan/Eid uncertainty, operational adjustments, additional costs, and views on earlier announcements, national coordination, and the GUHC.

3.3 Data analysis

Analysis proceeded in three stages. First, transcripts were read closely and coded inductively at the level of individual meaning units, remaining close to participants' own language and attending to the phenomenological aim of capturing lived experience rather than pre-existing categories. Second, these data-near codes were compared across participants and clustered into candidate themes. Third, the resulting themes were read against the Transaction Cost Economics literature and organised into the three categories reported in Section 4 information, coordination, and adjustment costs with *maslahah* introduced at the interpretive stage in Sections 4.6 and 4.7 as a normative lens for discussing the findings, not as a coding category applied to the raw transcripts. This sequencing is stated explicitly here so that the relationship between the phenomenological data-collection approach and the theory-informed reporting structure is transparent to readers.

3.4 Trustworthiness and Rigor

Analytic decisions were documented throughout data collection and analysis through memos recording code definitions, the rationale for clustering codes into candidate themes, and the point at which each theme was subsequently read against the Transaction Cost Economics literature; these memos constitute this study's audit trail. To strengthen analytic credibility, the first and second authors independently reviewed and coded three transcripts representing the transportation, retail, and logistics sectors before comparing their coding decisions. Minor differences concerned code labels rather than substantive interpretation and were resolved through discussion, after which the agreed coding framework was applied consistently across the remaining transcripts. Formal member checking and external peer debriefing were not part of the design of this study; this is acknowledged as a limitation in Section 6, and the credibility of the interpretation instead rests on the staged, transparent coding procedure described above.

3.5 Ethics and Informed Consent

All participants provided informed consent prior to the interview, covering participation in the study, audio-recording of the interview, and the use of anonymised direct quotations in subsequent publications; participants were informed of their right to withdraw from the study at any time without consequence.

3.6 Interview Protocol

The interview protocol included the following core questions:

1. "Can you describe your experience when the official date of Ramadan or Eid is announced close to the event?"
2. "How does uncertainty about the holiday date affect your business or household planning?"
3. "Have you ever changed work schedules, deliveries, purchases, or production because the holiday date changed?"
4. "What additional time, effort, or costs arise from those changes?"
5. "Would earlier confirmation of the holiday date help your planning? Why?"
6. "What is your opinion about national coordination or a Global Unified Hijri Calendar (GUHC)?"

Representative questions concerning institutional alternatives asked of participants included the following types: how participants currently plan around Ramadan/Eid given late confirmation of the date; whether earlier or nationally coordinated confirmation would change their planning; and how participants view the idea of a single, globally unified Hijri calendar. Questions about the GUHC were asked alongside, rather than in place of, questions about national coordination and earlier announcements, so as not to frame standardisation as the presumed preferred outcome.

4. Result and Discussion

4.1 Overview

Findings show that uncertainty in Hijri calendar determination remains a dominant, recurring experience for Indonesian business actors, particularly around the start of Ramadan and Eid al-Fitr. Informants consistently described being unable to pinpoint when peak demand would occur, forcing them to delay strategic decisions or prepare multiple operational scenarios simultaneously a condition that has effectively become a routine feature of operating in temporally sensitive sectors such as transportation, trade, and distribution (Mufid & Djamaluddin, 2023). Consistent with the TCE framework outlined above, three interrelated categories of transaction costs emerged directly from this uncertainty: information costs, coordination costs, and adjustment costs. Figure 1 maps these three themes and their constituent sub-themes as they emerged from the coding process, before Table 2 summarises them with illustrative evidence and each is discussed in turn.

Figure 1. Thematic map of transaction costs arising from Hijri calendar fragmentation.

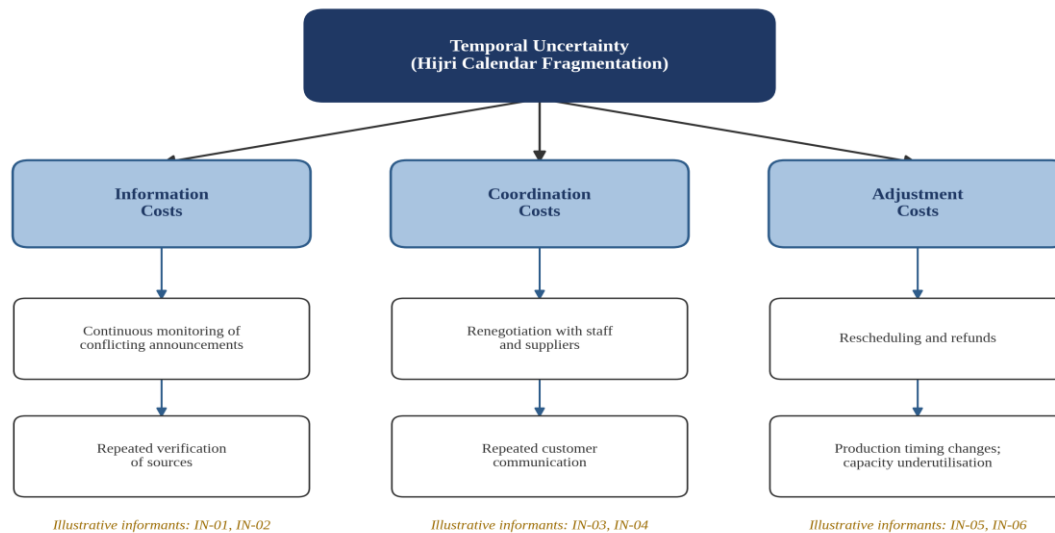


Table 2. Thematic Summary of Transaction Costs Arising from Hijri Calendar Fragmentation

Cost type	Manifestation in practice	Sector(s) most affected	Illustrative evidence
Information costs	Continuous monitoring of government, religious-organisation, and media announcements; repeated verification of conflicting reports	All sectors, most acute in retail	IN-02: "Every time Ramadan or Eid approaches, I keep checking the news — TV, social media, WhatsApp groups — because the information is often different, so I can't decide right away."
Coordination costs	Repeated renegotiation of work schedules with staff; re-confirmation of delivery timing with suppliers; repeated customer communication	Transportation, retail (supplier–customer chain)	IN-03: "When Eid isn't confirmed yet, we're unsure how to schedule staff. We set a schedule, then have to change it again because of a differing decision — that needs re-communication, and it also unsettles the staff."

Adjustment costs	Rescheduling of transport departures; refunds; production timing changes; over- or under-production; capacity underutilisation	Transportation, retail (perishable goods)	IN-05: <i>"I usually schedule production well ahead, but when Eid shifts, I have to rearrange everything. Sometimes the cakes are ready too early and lose quality by the time they're sold."</i>
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4.2 Information Costs

Information costs arise from the need to obtain certainty about the timing of religious observance. Informants described actively monitoring multiple, often conflicting, sources government announcements, religious-organisation statements, and mass media a process that consumes time and attention that would otherwise go to core business activity.

IN-01, who has operated an intercity travel business in South Sulawesi for more than a decade, described how divergent Eid determinations disrupt operational planning:

"We usually prepare the homecoming schedule well in advance, but when the Eid date differs [across authorities], passengers keep changing their minds some want to leave earlier, others wait. We end up revising the schedule, sometimes two or three times."

To manage this, IN-01 actively cross-checks multiple sources:

"We always have to check the news, the government, and the Islamic organisations. Sometimes the information conflicts, so we have to be ready for several possibilities."

IN-02, who has run a staple-goods retail business in Makassar for approximately eight years and depends heavily on accurate timing for stock and distribution planning, echoed this pattern:

"Every time Ramadan or Eid approaches, I keep checking the news TV, social media, WhatsApp groups because the information is often different, so I can't decide right away."

She further explained that the resulting hesitation directly affects commercial decisions:

"We become unsure about when to increase stock. If the timing is wrong, we can lose money. So I wait until it's truly certain but by then it's usually already very close."

Read in relation to TCE, these accounts describe a pattern consistent with information costs — the expenditure of time and attention incurred to search for, verify, and process information before an economic decision can be made (Marneffe et al., 2019). When asked about a potential GUHC, participants' responses were consistent with valuing earlier, standardised certainty; as IN-01 put it:

"If the Eid schedule were certain from the start, we could organise everything more neatly. No need to keep changing the schedule, and costs could be reduced too."

This is reported here as IN-01's own expectation about a hypothetical scenario, not as evidence that a GUHC would in fact reduce costs; participants were not asked to evaluate a GUHC against the alternative.

4.3 Coordination Costs

Coordination costs emerge from the need to realign multiple operational relationships once the timing of a religious holiday shifts. IN-03, a Muslim-clothing trader in Makassar whose

sales rise sharply ahead of Eid, described the resulting difficulty in coordinating both staff and suppliers: *"When Eid isn't confirmed yet, we're unsure how to schedule staff. We set a schedule, then have to change it again because of a differing decision that needs re-communication, and it also unsettles the staff."* Supplier coordination is affected in the same way: *"We have to reconfirm delivery arrangements. If Eid moves earlier or later, shipments need to be adjusted too that often means going back and forth."*

Consumers experience a mirrored version of the same cost. IN-04, a regular Eid shopper, reported having to repeatedly contact sellers because they, too, lacked certainty: *"I often ask the shop when new stock is arriving, but they're not sure either, because they're waiting on the Eid decision. So I have to check again and again."* This uncertainty also shaped her purchasing behaviour: *"When the timing isn't certain, I hesitate to buy a lot at once I worry about buying too early or too late."*

In TCE terms, this is a clear illustration of rising coordination costs driven by uncertainty, consistent with evidence that informal, relational coordination becomes more costly to sustain precisely when the conditions it governs are unstable (McManus, 2023), costs that, notably, are not confined to the firm but extend across the transaction chain to consumers. Were a GUHC in place, both traders and consumers indicated that work schedules, distribution, and purchase timing could be planned with far less need for repeated communication.

4.4 Adjustment Costs

Adjustment costs arise from sudden changes to plans that had already been finalised. IN-05, who produces dry cakes in bulk ahead of Eid in Makassar, described how divergent holiday timing forces last-minute changes to a production schedule set well in advance: *"I usually schedule production well ahead, but when Eid shifts, I have to rearrange everything. Sometimes the cakes are ready too early and lose quality by the time they're sold."* These adjustments carry direct financial consequences: *"If I have to re-produce or store the goods longer, that's an added cost not to mention extra raw materials when my initial estimate turns out wrong."*

The same cost is borne by consumers. IN-06, a private-sector employee who regularly prepares Eid provisions for his family, recalled: *"I once bought Eid cakes early because it seemed like Eid was close, but it turned out to be later than expected. By the holiday, the cakes weren't fresh anymore."* He then had to purchase again: *"So I had to buy new ones that's clearly extra spending."* Adjustment costs thus fall on both producers and consumers; participants themselves attributed these costs to temporal unpredictability rather than to their own planning errors, although the qualitative design used here cannot independently rule out managerial planning error or other firm-level factors as contributing causes. The exposure of perishable-goods producers such as IN-05 is particularly notable: once inputs and labour are committed to a production schedule, that investment becomes difficult to redeploy without loss — the kind of asset-specific vulnerability to opportunistic timing that Klein, Crawford, and Alchian's foundational analysis, as revisited by Weber and Coff (2024), identifies as a key driver of transaction costs in settings where commitments cannot easily be reversed.

Evidence from logistics participants. Logistics participants (IN-09, IN-10, IN-13) similarly described distribution disruption arising from divergent holiday timing across regions. As one logistics participant explained: *"When the Eid date is still uncertain, we usually hold back bulk shipments first. It's better to be one day late than to resend goods because the customer's*

schedule changes. So we build extra buffer time into the delivery schedule.” Consistent with this account, logistics participants described delaying bulk shipments until holiday timing was confirmed and building buffer time into delivery schedules as a mitigation strategy, a pattern discussed further below.

4.5 Sectoral Patterns and Adaptive Coping Strategies

Beyond these three cost categories, sectoral patterns are evident within this small sample: transportation firms most often described rescheduling costs, retail businesses most often described demand-timing uncertainty, and logistics operators most often described distribution disruption when different regions enter the holiday period at different times these are patterns observed in this sample rather than statistically established sectoral differences. Figure 2 summarises this pattern as a qualitative exposure matrix. A sector-theme pairing was classified as Primary when the theme was raised by all or nearly all of that sector's participants and coded as a dominant concern across the majority of that sector's coded segments, and as Secondary when the theme recurred among the sector's participants without being its most salient concern. Retail was classified as Primary across information, coordination, and adjustment costs because all retail participants consistently described substantial burdens in monitoring holiday-date information, coordinating with suppliers and customers, and adjusting inventory or production schedules. Unlike transportation participants, whose accounts were dominated by rescheduling concerns, and logistics participants, whose accounts centred primarily on distribution timing, retail participants reported high salience across all three transaction-cost categories. Because this classification rests on qualitative salience rather than a numerical or statistically validated procedure, it is offered as an illustrative summary of the coded data rather than a precise or reproducible measurement, and should be read alongside the narrative comparison above rather than in its place.

Figure 2. Sectoral exposure matrix: transaction-cost salience derived from thematic analysis.

	Information costs	Coordination costs	Adjustment costs
Transportation	Secondary	Secondary	Primary
Retail	Primary	Primary	Primary
Logistics	Secondary	Secondary	Primary

In response, firms have developed coping strategies that broadly resemble the flexibility-oriented responses to environmental complexity described in the operations-management literature (Yu et al., 2023). Retailers commonly adopt gradual, rather than bulk, stocking to reduce exposure to demand-timing risk, and some extend the length of the selling period to hedge against a shifting holiday date. Transportation operators prepare multiple departure scenarios (*multiple scheduling*) based on possible differences in Eid timing a strategy that reduces service-disruption risk but simultaneously raises operational complexity and coordination cost, echoing the trade-off between flexibility and complexity that governs make-or-buy decisions more generally (Elalem, Bicer, & Seifert, 2022). Logistics operators increase distribution flexibility, delaying bulk shipment until timing is confirmed and building buffer time into delivery schedules as a mitigation measure.

These strategies are best understood as defensive adaptation rather than resolution: they do not eliminate the underlying inefficiency but redistribute it into additional hidden costs: storage, extra coordination, and forgone market opportunity. In TCE terms, firms are attempting to internalise uncertainty through operational workarounds, yet transaction costs are not eliminated so much as displaced. This points to the institutional structure itself, rather than firm-level behaviour, as a plausible source of the underlying inefficiency: absent some form of institutional change whether a GUHC, national harmonisation, earlier announcement deadlines, or coordinated contingency protocols these adaptive strategies are likely to remain a costly, temporary coping mechanism rather than a structural solution, without this study establishing which of these institutional routes would be most effective.

4.6 Synthesis: Uncertainty as the Operative Variable

Taken together, these findings indicate that, within participants' own accounts, temporal uncertainty not calendar fragmentation as a doctrinal matter per se is the variable most consistently associated with the transaction-cost burdens described across the three sectors studied. This is consistent with the TCE proposition that uncertainty is a central determinant of transaction-cost magnitude (Zeng & Yu, 2024), and it extends a proposition more commonly applied to firm boundaries and contracting arrangements (Hosseini & Tavakoli, 2023) into a domain religious time governance that has received little attention in the institutional-economics literature. From informants' own accounts, a GUHC was consistently viewed as a mechanism that could reduce transaction costs by increasing certainty and simplifying coordination not merely a religious-unification proposal but, in the language of the businesses interviewed, a practical efficiency instrument; this reflects participants' own expectations about a hypothetical scenario, however, rather than an evaluation this study can make of whether a GUHC would in fact outperform less extensive institutional alternatives. Consistent with the *maslahah* framework developed in Section 2, a reduction in waste and improvement in coordination of this kind is the sort of institutional outcome that *hifz al-mal* calls for, suggesting that Hijri calendar governance carries economic significance that extends well beyond its religious dimension.

These findings should nonetheless be interpreted with caution regarding causal attribution. The interviews document participants' own perceived association between calendar uncertainty and the operational burdens described; they do not, and by design cannot, isolate calendar fragmentation as the sole or primary source of these burdens relative to other plausible contributors, including ordinary Ramadan/Eid demand volatility, transportation

congestion, the quality of a firm's own inventory-management practices, variation in managerial preparedness, supplier-side constraints, official holiday-leave policy, regional supply-chain structure, and general seasonal demand effects. The qualitative design used here is well suited to documenting how calendar uncertainty is experienced and interpreted by participants, but it does not permit these competing explanations to be ruled out, and the findings are accordingly reported as perceived associations rather than as demonstrated causal effects of calendar fragmentation specifically.

It is also worth noting, in the interest of analytic transparency, that no participant in this sample explicitly reported that calendar variation had a negligible operational effect, that existing coping mechanisms were fully adequate, or that the GUHC might introduce new costs or institutional problems of its own. The analysis did not identify deviant or disconfirming cases within this dataset; this is reported here as a transparent feature of the sample and coding process rather than as evidence that no such views exist among the wider population of business actors and consumers.

4.7 Policy Implications

These findings carry several tentative policy implications, offered here as possibilities the qualitative evidence can inform rather than as established policy conclusions. First, calendar-determination policy in Indonesia has historically been shaped almost entirely by fiqh and astronomical considerations; the economic dimension identified here perceived transaction-cost burdens affecting business and household planning has received comparatively little attention and merits explicit integration into future policy deliberation, pending the more precise, quantitative estimation this study's design cannot itself provide. Second, government and religious authorities might consider strengthening institutional coordination in the determination of religious time; institutional-economics scholarship suggests that clearly defined, shared rules can reduce the transaction costs of cooperation among otherwise autonomous actors (Kuzmin & Suvorova, 2023), and recent survey evidence indicates that a meaningful share of Indonesian Muslims already express willingness to adopt a global Hijri calendar of the kind proposed by the GUHC (Budiwati, Krismono, Aziz, Arafat, & Setiawan, 2026), suggesting that public receptivity may not be a binding constraint on any of the several coordination options available, including national harmonisation, earlier and firmer announcement deadlines, and coordinated contingency protocols among industry associations, as well as a GUHC. A GUHC could, in this respect, be positioned as one policy option among several capable of reducing the temporal uncertainty that participants in this study associated with information, coordination, and adjustment burdens across sectors, potentially allowing earlier and more uniform certainty to support more efficient planning of production, distribution, and consumption (Marwadi, Labib, & Zain, 2025); this study's qualitative evidence speaks to participants' own expectations about such a scenario, however, and does not establish that a GUHC would outperform these less extensive alternatives. Third, because participants across transportation, retail, and logistics all associated temporal uncertainty with operational burdens, calendar policy is not solely a religious matter but one with plausible bearing on business planning more broadly, warranting a more inclusive policy dialogue among religious authorities, government, and business actors; this study's design,

however, does not permit an assessment of the scale of that bearing at the national level. Fourth, within the *maslahah* framework, policies that reduce resource waste, lower transaction costs, and strengthen economic coordination are, in principle, worth prioritising; a GUHC is one candidate form such reform could take, consistent with *maslahah*, among the several institutional responses discussed above, and its adoption relative to these alternatives remains a policy judgement this study's qualitative evidence can inform but not settle.

5. Conclusion and Suggestion

This study concludes that fragmentation in Hijri calendar determination is associated, in the accounts of the business actors and consumers interviewed here, with perceived and reported transaction-cost burdens. Divergence in the timing of religious observance, particularly around Ramadan and Eid al-Fitr, is described by participants as generating recurring information, coordination, and adjustment burdens across their economic activity.

First, participants reported that calendar fragmentation gives rise to information, coordination, and adjustment burdens arising from the need to manage temporal uncertainty, search for additional information, and repeatedly revise operational plans. Calendar fragmentation is therefore not solely a normative-religious matter; participants described consequences for how they organise and pay for their own operations, although this study did not collect firm-level financial records and cannot quantify these consequences in monetary terms. Second, this study identifies temporal uncertainty, as perceived and reported by participants, as the variable most consistently associated with these burdens across the transportation, retail, and logistics sectors, leading firms and households to delay decisions, prepare alternative scenarios, and repeatedly adjust plans. Third, from an Islamic-economics perspective, the concept of *maslahah* offers normative grounds for regarding a system capable of reducing uncertainty and strengthening coordination as supportive of collective welfare; within this normative framework, the GUHC is one candidate institutional response among several including national harmonisation, earlier announcement deadlines, and coordinated contingency protocols that participants themselves associated with reduced coordination burdens, without this study empirically establishing it as the superior mechanism relative to these alternatives.

Overall, this study suggests that religious time governance is meaningfully connected to participants' own economic experience, and that movement toward greater standardization whether global, national, or regional is perceived by participants as one route among several through which institutional reform could contribute to economic coordination and welfare in Islamic-economic terms. Future research employing quantitative or mixed-methods designs is encouraged to estimate the magnitude of these perceived transaction costs more precisely, complementing the depth this qualitative account provides with the breadth needed for policy calibration.

6. Limitations and Future Research

This study is subject to several limitations. First, its phenomenological design, based on 15 informants concentrated largely in South Sulawesi, limits the generalisability of the findings to other regions and sectors of the Indonesian economy; future studies could extend the

sample across a wider geographic and sectoral range. Second, the costs discussed in this study are derived from informants' subjective accounts rather than firm-level financial records; future research combining qualitative interviews with quantitative cost data (for example, operational expense ratios before and after periods of calendar uncertainty) would allow the magnitude of these transaction costs to be estimated with greater precision. Third, this study focuses on business actors' perspectives and does not directly capture the views of religious authorities responsible for calendar determination; incorporating this perspective would provide a more complete picture of the institutional dynamics involved. Future research is encouraged to test the propositions developed here across broader samples, additional sectors, and comparative national contexts, and to explore the feasibility and design of GUHC implementation from both economic and shariah-governance perspectives.

Declaration of AI and AI-assisted technologies

During the preparation of this work, the author(s) used Claude (Anthropic) to assist with language editing and structural revision in line with journal formatting requirements. The authors reviewed and edited the AI-assisted content as necessary and take full responsibility for the content of this publication.

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