The Islamic Monetary Standard: The *Dinar* and *Dirham*

Adam Abdullah *

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Abstract

The *Shari'ah* not only considers the Islamic monetary standard as a medium of exchange, unit of account, store of value and a standard of deferred payment, but the Islamic functions of money also determine *Shari'ah* legal injunctions concerning *zakat* (poor tax), *jizya* (poll tax), *kharaj* (tax on conquered territory), *diyyat* (blood-money), *sariqa* (theft), *mahar* (dowry) and *sarf* (exchange). This study seeks to clarify the weight of the *dinar* and *dirham*, since they impart justice as part of *Shari'ah* law. Through library research and content analysis of literature from the *hadith*, scholars, mint-masters and writers, different regions had different weights and coin standards, which might imply differing opinions as to what constitutes a legal *dinar* and *dirham*. However, narrations have clarified the relationships between the Byzantine *dinar* and the *mithqal* of Persia, Makkah, Syria, Egypt and Iraq. Combined with additional numismatic and metrological analysis of surviving coins and glass weights, we discover that each *mithqal*, *dirham*, *daniq*, *qirat*, *habbah* and *khardal* are defined differently, but reflect the same standard of the Prophet (s.a.w.s.) that was later externalized with the minting of the first Islamic *dinars* and *dirhams* by Caliph ᶜAbd al-Malik ibn Marwan, involving modern equivalents weights of 4.25g and 2.975g.

Keywords: Islamic Currency, Islamic Economics, Monetary Economics

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* Al Qasimia University, United Arab Emirates, aabdullah@alqasimia.ac.ae, ORCID: https://orcid.org/0000-0001-6733-5647

Introduction

Money is the common denominator for all economic transactions. Man is free to choose any other medium of exchange, but there are implications for doing so. Ibn Khaldun (the father of Islamic economics) tried to warn the Mamluk government in his *Muqaddimah* (written in 1377), from avoiding monetary mis-management, as it would lead to their collapse. Ibn Khaldun died in 1404, the year that Egypt suffered a hyper-inflationary depression that resulted in the destruction of half of the human population and all of the livestock in 1405 as a result of famine and plague, the latter which Al-Maqrizi, the student of Ibn Khaldun, attributed to punishment from *Allah* (s.w.t.). Al-Maqrizi wrote the *Ighathah* in 1405 (Al-Maqrizi, 1994, 1940) and *al-Nuqud al-Islamiyyah* ('The Islamic Currency') in 1415 (Al-Maqrizi, 1967) as emphatic warnings to Muslims not to discard the *dinar* and *dirham* for any other medium of exchange including a *fiat* currency such as copper (*fulus*). "[The people] should deal exclusively with gold and silver for pricing goods" (Al-Maqrizi, 1994, p.80), and "Allah (s.w.t.) never made [*fulus*] legal tender" (*An-Nuqud*, 1967, p.34 cited by Meloy, 2003, p.200). Furthermore, one of the functions of money in Islam specifically mentions the *dinar* and *dirham* in imparting justice, involving *Shari'ah* legal injunctions regarding *zakat* (poor tax), *jizya* (poll tax), *kharaj* (tax on conquered territory), *diyyat* (blood-money), *sariqa* (theft), *mahar* (dowry) and *sarf* (exchange).

Therefore, this study provides a comprehensive analysis of the *dinar* and *dirham*. This also requires a satisfactory explanation of the Islamic currency in relation to other regional coin weights and standards. It should be mentioned that the unit or measure of value was a function of money that also reflected an "accounting unit of value" or "money of account". Such a unit of value lacked the external physical form of coinage, it was still 'real', given that it was linked to weight standards of circulating gold and silver coins. Indeed, at the time of the Prophet (s.a.w.s.), the theoretical weights of the *dinar* and *dirham* for the payment of *zakat* were monies of account. Although, circulating Sassanian and Byzantine coins were adopted, the external weight and fineness of the Islamic *dinar* and *dirham* were only later minted by the Umayyad caliph ᶜAbd al-Malik ibn Marwan (r.a.) in the year 697 (77H). Subsequently, two important "monies of account" would also later evolve in Egypt: the army *dinar* (*dinar jayshi*), which was used to value land (*iqtaᶜ*) distributed by the Sultan, and also the copper *dirham* of account (*dirham min'l fulus*), which was used to convert the value of existing coinage and introduced at the time of the collapse of the Mamluk gold and silver monetary system.

In reality, coins circulated by specie (intrinsic value) and not by tale (face value). The *dinar* and the *dirham* were different currencies and would be assessed according to their respective bullion content and purity, the supply and demand gold and silver coinage, and whether a coin was accepted for the payment of Islamic taxes and by preference (Muslims would prefer Islamic inscriptions rather than other images, motifs or inscriptions). Under a bimetallic commodity standard, bad money would drive out good money when a coin of low intrinsic value ('bad money') circulated with a coin at par, of equal extrinsic value but higher intrinsic value ('good money'). The lighter coin of lower value would be spent rather than the heavier coin of higher value, which would then be sold abroad. However, Gresham's Law would not

apply if differing coinage circulated at market exchange rates according to their intrinsic value alone. Indeed, the Geniza documents (Goitein, 2000, 1, pp.229-266) confirmed that coins fluctuated with differing exchange rates according to the supply and demand of metal and the precious metal content - notwithstanding the cost of production and minting (brassage), which was absorbed by the mint (*sikka*) (Udovitch et al, 1978, p.124; Goitein, 1965, p.44). The price of goods and services, or "God's price" (*si'r Allah*), agreed on in the market, was not distorted or inconvenienced given the intrinsic rates of exchange, and not only provided an equivalent counter-value, but were fully considered in business transactions. The role of the moneychanger (*sarafi*), therefore, was to determine the relative fair rates of exchange between two coins according to instrinsic value. It would be incorrect to generalize that coins in circulation where fixed in relation to each other, so that the Fatimids had adopted a bimetallic commodity standard, the Ayyubids a gold commodity standard, and that the Mamluks had initially adopted a gold commodity standard supported by silver, followed by a silver commodity standard supported by copper. The evidence does not reveal that these dynasties formally adopted any of these standards (Schultz, 2008, 1, pp.321-323). However, government proclamations, edicts, and debasement of currencies and monies of account, certainly did occur, which in terms of monetary policy, served to undermine the value and purchasing power of money. Generally, silver (*fiddah*) and gold (*dhahab*) were essentially unitized into *dirhams* and *dinars*, so that for legal and official purposes, lower quality *dirhams* were referenced to in texts and differentiated from higher quality *dirhams* (*dirham nuqrah*) that were in circulation at the time (Rabie 1972, p.162ff; Schultz 1995, pp.147-9,163,234-5; Borsch 2005, pp.68-71; Goitein 1965, p.35).

1. Islamic Monetary Standard

The Islamic monetary standard is essentially a theory of coinage: "the *dinar* and *dirham* have not been created…but as the medium of exchange for things" (*Ihya*, 2004, 4, pp.90-91; Usmani, 2001, pp.81-83). The approach taken in this study involves library and document analysis, with sources from the *Shari*ᶜ*ah*, historical accounts from jurists and writers, and combined with empirical scientific evidence concerning the various coin (numismatic) and weights standards (metrology) adopted by Muslim dynasties. Whilst the *dinar* and the *dirham* fully satisfy the Islamic functions of money, as a unit of account or measure of value, we must acknowledge that certain types of medium of exchange are unlawful in Islam – for instance, using leather from swine. However, other types have also been excluded, such as promissory notes.

- "It was reported that Abu Hurairah (r.a.) asked Marwan: "Have you legalized usury?" Marwan said: "No." Then Abu Hurairah said: "You have legalized selling promissory notes (*sukukun*) whereas the Messenger of *Allah* (s.a.w.s.) forbade selling food-stuff unless received by the seller". Marwan then addressed the people and forbade selling such notes" (*Muwatta*, 1991, p.260).

Logically, *sukukun* include non-interest bearing non-redeemable promissory notes issued as paper currency by a central bank, such as the Federal Reserve's federal reserve note (the dollar)

or Bank of England's (BoE) pound note. The latter still has the now broken "promise to pay the bearer the sum of five (10/20/50) pounds" of silver or gold, since the BoE paper notes were historically redeemable for bullion coins (BoE, 2020). The BoE tried to justify a new meaning of the word 'promise', where "public trust in the pound is now maintained by the operation of monetary policy, the objective of which is price stability", and yet central banks have broken this promise as well (Abdullah, 2013 Mar./Oct./Dec., 2015 Dec., 2016, 2018). *Fiat* money is largely debt organized into bank money (the medium of exchange is debt), where a customer promises to repay a debt, and the bank promises to repay a customer's deposit, thus bank credit involves exchanging two interest bearing IOUs, but such a "transaction would then come into the forbidden category of a debt for debt" (*Muwatta*, 1991, p.254).

Given Imam Ghazali's observation that "a counterfeit coin is one, which has got nothing of gold and silver. The coin in which there is something of gold and silver cannot be called counterfeit" (*Ihya*, 2004, 2, p.58), we must also logically conclude that modern alloy coins are also unlawful. Due to a shortage of *an-nuqud*, ᶜUmar ibn al-Khattab (r.a.) contemplated using leather from camels as a medium of exchange (*wasilat al-tabadul*), but the *sahabah* advised against it since it would create a shortage of camels (Hail, 1999, p.145 cited by Haneef and Barakat, 2006, p.28) – hence despite the difficulties, Muslims knew that there would be ramifications for adopting something other than what the *Shariᶜah* had intended. Man is free to choose the medium of exchange, but there are repercussions if it is not *an-nuqud* and as mentioned, one of the Islamic functions of money involves *an-nuqud* within *Shariᶜah* legal requirements. Also, a specific *hadith* insists on the "prohibition of destroying *dirhams* and *dinars*";

- "ᶜAlqama b. ᶜAbdullah (r.a.) reported on the authority of his father that *Allah's* Messenger (s.a.w.s.) forbade from destroying the coins in vogue among the Muslims without any necessity" (Ibn Majah 12:2263, also Abu Dawud 23:3442).

We have therefore a specific injunction in the *hadith* that clearly states that Muslims cannot destroy the *dirhams* and *dinars* that were in circulation – if we cannot destroy them, surely we cannot discard them, only to adopt promissory notes and counterfeit coins, which have been specifically rejected by classical scholarship. *Rasulullah* (s.a.w.s.) "is said to have prayed for the continuation of [*an-nuqud*] for the *ummah* to exist as a prosperous community…[and] that gold and silver, whose currency values were measured in *dinar* and *dirham,* remained extremely stable over long periods of time in Islamic history" (Choudhury, 1997, p.92). *Fiat* money is backed by debt and owned by the central bank, and bank money (in the form of deposits) is not money at all, but merely represents non-cash credits and specifically involves a promise to pay *fiat* money upon demand; hence, demands deposits reflect a right, which will not be honoured if all the claimants exercises that right at the same time.

Unlike *fiat* money, one of the attributes of gold and silver is scarcity and the inability of alchemists to create bullion (money) out of nothing, may be contrasted with the modern alchemy of credit (money) creation from lending by the modern banking system (Abdullah,

2018). *An-nuqud* has physically been used since the dawn of mankind, since the first person to mint the *dinar* and *dirham* was none other than Adam (a.s.) (Al-Maqrizi, 1994, pp.55-56). By the 7th century, the Arabs primarily traded with the Romans and the Persians: "(It is a great Grace and Protection from *Allah*), for the taming of the *Quraysh*, (and with all those *Allah's* Grace and Protections for their taming, We cause) the (*Quraysh*) caravans to set forth safe in winter (to the south), and in summer (to the north without any fear)" (*Al-Qur'an* 106:1-2), and in so doing the Arabs brought back Byzantine gold from *Ash-Sham* in the form of Heraclian *dinars*, *Sassanid* silver in the form of Chosroes *dirhams* and also *dirhams* from Yemen. The Arabs referred to these gold and silver coins as *an-nuqud* (currencies), although *naqd* also means the payment of a price in *dirhams*, as relayed in the *hadith* of Jabir, "He paid (*naqada*) me its price" (Muslim 10:3886). Currency was clearly defined as: "*nuqud* is the plural of *naqd* and is composed of gold and silver" (*Majallah*, Art.130), and scholars wrote extensively on their usage, such as Al-Maqrizi whom even wrote a book specifically entitled "The Islamic Currency" (*al-Nuqud al-Islamiyyah*, 1967).

Muslims continued to use Heraclian *dinars* and Chosroes *dirhams* throughout the life of the Prophet (s.a.w.s.), and the Khalifah of Abu Bakr as-Siddiq (r.a.), up until the 8th year of the *Khalifah* of ᶜUmar (r.a.), when in 20H he coined *dirhams* in the Sassanid style retaining the Pahlavi faces but adding Kufic Arabic letters such "In the Name of *Allah*" or "In the Name of *Allah*, my Lord". However, in 75H the Umayyad caliph ᶜAbd al-Malik ibn Marwan (r.a.), coined standardized *dirhams* in a specifically Islamic style, and in 77H he minted *dinars* at Damascus which also carried Islamic texts in the Kufic Arabic script, thus Muslims abandoned the currency of others and adopted their own, thus externalizing the theoretical coins and weights enjoined at the time of *Rasulullah* (s.a.w.s.). A number of Islamic injunctions rest upon the accurate knowledge of the weight and purity of the *dinar* and *dirham*, and the coins minted by ᶜAbd al-Malik ibn Marwan were exactly in conformity with the *Sunnah* in order to pay *zakat* (poor tax). Yet what was the weight and purity of the Islamic currency? Narrated Abdullah ibn ᶜUmar: "The Prophet (s.a.w.s.) said: '(The standard) weight is the weight of the people of Makkah, and the (standard) measure is the measure of the people of Medina.'" (Abu Dawud 22:3334), since the Makkans were traders whilst the people of Medina were farmers. Yet, what is the Islamic legal coin standard and what are the relevant weights of Makkah? From the *hadith*, scholars, mint-masters and writers, and as noted by Ibn Khaldun (1958, 2, p.58) different regions had different weights and coin standards. We are confronted with a myriad of differing opinions as to what constitutes a legal *mithqal* and a *dirham*, whereas in fact, there is no conflict. Each *mithqal*, *dirham*, *daniq*, *qirat*, *habbah* and *khardal* are defined differently to describe the same weight standard stipulated by the Prophet (s.a.w.s.) later externalized by ᶜAbd al-Malik ibn Marwan. Some narrations have clarified the specific relationships between the Byzantine *dinar* and the *mithqal* of Persia, Makkah, Syria, Egypt and Iraq. The key difference is in the actual weight of the *qirats*. The term 'Makkan *mithqal*', is used inter-changeably and means the same as the '*Shariᶜah mithqal*' or 'legal *mithqal*'.

2. Byzantine *Dinar* and Persian *Mithqal*

Differing weight standards prevailed in Damascus (22 *qirats* less a *habbah*), Cairo (24 *kharrubahs*), Makkah (20 *qirats*), or Iraq (60 *habbahs* of 100 *khardal*) that would define a *mithqal* in a differing number of *qirats*, *habbahs* or *qamhahs*. The *carat* is the seed of the carob tree (*ceratonia siliqua*) and known as *siliqua* in Latin, *keration* in Greek and either *qirat* or *kharrubah* in Arabic. The *siliqua* was used as a weight, and as a coin. Theoretically, the Roman *carat* was the weight of the carob seed, and 24 carats equaled the *dinar*, and 72 *dinars* equaled a Roman pound (*libra*). Originally, the Roman *dinar* was the *denarius aereus* (Eagleton and Williams, 2007, p.88) and replaced by Constantine I in the year 312 with the Byzantine *solidus*, which also tariffed at 1/72 of the Byzantine pound (*litra*). The late Roman and early Byzantine pound was theoretically 327.45g, and thus the *solidus* weighed 4.55g. The pound fell to 324g by the 4th-6th centuries, to 322g by the 6th-7th centuries, and then to 320g in the 7th century, given surviving pound and *solidus* weights in the British Museum (Entwistle, 2002, p.611)[1]. Thus, by the time of Heraclius the Byzantine pound weighed about 320g, and the contemporary Byzantine standard *dinar* of Heraclius was the full *solidus* of 4.4g (Broome, 1985, p.11), or more precisely 4.44g as reflected in surviving coinage, for example struck at Carthage in 629/630 (Grierson, 1999, p.6). However, the Byzantines also minted a reduced *solidus* at Carthage and other cities for trade with the East, which weighed a full *solidus* less a *siliqua*, or 4.25g (Broome, 1985, pp.12,14), and was the weight of a *mithqal*[2]. It is interesting to note that the Byzantine pound of 6,912 grains would later by adjusted into the Troy pound of 5,760 grains, by adjusting the *scrupulum* from 24 wheat grains to 20 barley grains, so that 288 *scrupulum* x 24 = 6,912 wheat grains, and 288 *scrupulum* x 20 barley grains = 5,760 wheat grains: thus the Byzantine and also Persian metrological systems, were based on a wheat grain, so that the Byzantine full *solidus* and the Persian gold coins would weigh approximately 4.6g.

Indeed, the Persian systems would later influence the Il-Khanate (Persian, Iraq, Turkey) and Ottoman (Turkey/Anatolia) monetary systems, as reflected in the Tabriz *mithqal*, being distinct from the *dinar mithqal*, which weighed 72 grains of barley (Al-Maqrizi, 1994, p.57), since the former reflected a Persian coin standard of the Il Khanate and was based on the wheat grain rather than the barley grain (Kabaklarh, 2007, p.33). The *mithqal* was an ancient weight: in Persia it was historically derived from the weight of 24 chick-peas (*nakhod*), each weighing 4 *gandums* or wheat grains (Frey, 1917, p.151), whereas the Romans originally used *karats* (carob seeds), a term used by the Arabs (*qirat*). The Arabic word *nuqud* (gold and silver coins) is derived from the Persian *nakhod* (a weight for gold and silver). Mahmud Ghazan Khan (694-704H/1295-1304), had no doubt learnt from the short reign and demise of his uncle Gaykhatu

[1] Each *solidus* would be weighed by a copper-alloy weight or *exagium solidi*: the English word 'assay' is derived from the Latin '*exagia*', and 'soldier' is derived from '*solidus*' (meaning 'solid' in Latin) reflecting the coin used as payment for his services. Fractions of the *solidus* known as *semissis* (half-solidi) and *tremissis* (one-third solidi) were also produced. Numismatics, or the study of currency, is derived from the ancient Greek word *nomisma* meaning 'money', and also means a 'coin' in Latin. The English word 'money' is derived from the Latin '*moneta*', which means the 'mint' in which coins were struck ('*as-Sikka*' in Arabic).

[2] *Mithqal* referred to a weight and *dinars* were weighed with glass *mithqal* weights.

Khan, following the latter's failed experiment at issuing paper money in 1294, and having moved the administrative capital of the Il Khanate to Tabriz in 1295, ordered in 696H/1296-7 that all coins of the regional governments, under the sovereignty of the Il-Khan, including the Ottomans, would be fixed according to the Tabriz *mithqal*, as part of his monetary reformation. Thus, the Ottomans paid taxes to the Il Khan in *dirhams* weighing 3.072g, and when they subsequently minted their first silver coin in 1326, the *akche* weighing 1.152g, it was supposed to be struck from a pure (*halis ayar*) silver (Pamuk, 2000, p.46), whilst in practice the Ottomans may have typically achieved a fineness of 23-23½ carats (Kabaklarh, 2007, p.36). The *akche* was 1/4th of the Tabriz *mithqal* or 6 karats = 6 x 0.192 = 1.152g and from 100 Tabriz *mithqals* 400 *akche* were minted (100 x 4.608 / 1.152). Technically, the Ottoman monetary system involved mono-metallism, whereby one commodity standard existed, being the silver *akche* as the basic unit of account, in terms of which the value of other commodities are measured, even if the circulation of money may include several metallic or indeed paper units, including the gold *sultani* and the copper *mangir*.

During the Umayyads and ᶜAbbasids the *dinar* was a recognized stable standard of payment, and was often used as a medium of exchange throughout the Mediterranean. By the time of the Mamluks, the 4.25g *dinar* had been devalued by 20% in 829H/1425 to the 3.4g *ashrafi* (named after Barsbay, *al-Malik al-Ashraf*), which was slightly lighter than the Venetian ducat and became the standard Mamluk gold coin. The first Ottoman gold coin, the *sultani*, was minted in 882H/1477 and was exchanged at par to the *ducat*, reflecting the latter's popularity as a trade coin. Ottoman coins were based on the Tabriz *mithqal*: from 100 Tabriz *mithqals* 129 *sultanis* were initially minted weighing 3.572g of 0.997 fine (Pamuk, 2000, p.63). The Tabriz *mithqal* = 24 karats = 1.5 *dirhams*. Each karat = 4 *habbah* of wheat. Since the grain of wheat weighs approximately 0.048g, the karat = 0.192g, the Tabriz *mithqal* = 96 *habbahs* x 0.048 = 4.608g, and the *dirham* = 4.608 / 1.5 = 3.072g (Kabaklarh, 2007, p.33). In 1477, from 100 *mithqals* = 100 x 4.608 / 129 = 3.572g *Sultanis* were minted. From 100 *mithqals*, the weight was reduced in 1526 to 130 *sultanis* (3.545g), and in 1564 to 131 *sultanis* (3.518g), with the 0.997 fineness unchanged (Pamuk, 2000, p.63). At that time, the Venetian *ducat* (*zecchino* or sequin) = 3.4909g of 0.986 fineness or 0.1107/troy oz actual gold weight (3.4909 x 0.986 / 31.103), comprising of 54 troy grains, was first minted in 1284, adopting similar standards to the *florin* of Florence which was struck in 1252.

Table 1 presents the Byzantine metrological system, and we may compare a Heraclian *solidus* of 4.44g to the early Byzantine standard of 4.55g. The orientalists equate the *sextula* or *mithqal* as the full *solidus*, however when we deduct one *siliqua* from the 7th century *solidus* we obtain the reduced *solidus* of 4.25g, being the equivalent weight of the actual *mithqal*, as reflected in the specific coins and glass weight identified in table 2 below. We may calculate the early Byzantine full *solidus* comprising 4 wheat grains of 0.0474g per *siliqua*, with 24 *siliqua* per *sextula*, which equals 4.55g (= 4 x 0.0474 x 24); or we may say, 4 *scrupulum* of 24 grains each 0.0474g. The *uncia* (*uqiyyah*), or ounce, represents 6 *sextula* (= Byzantine *dinar*) or 8 *drachma* (= *dirham al-kayl*), or a ratio of 8:6 = 1 1/3, and when one applies the same Byzantine ratio to the

Muslim *mithqal* coin standard of 4.25g we obtain 3.186g (= 4.25 / 1.333), or a *dirham* weight based on the apothecaries' weight system. As reflected in table 4 below, the Islamic ratio between the legal *dinar* and *dirham*, whether between legal *qirats* (20:14), or legal *habbas* (72:50.4), is not 1 1/3, but rather 1 3/7, such that the legal *dirham* weighs 2.975g. Since 1958, the modern Troy weight is now based on a nominal grain of 0.06479891g. Thus, 1 Troy oz of 480 troy grains (= 5,760 / 12) has a modern metric equivalent of 31.1034768g, the reciprocal of which is 0.0321507 Troy ozs / gram, and thus 1 metric tonne = 32,150.7 ozs.

Table 1: The Apothecaries Late Roman / Early Byzantine Metrological System

Byzantine Name	**Arabic Equivalent**										**Byzantine (gr.)**	**7th Cent. (gr.)**
libra (pound)	*ratl*	1									327.45	319.50
uncia (ounce)	*uqiyyah*	12	1								27.29	26.63
sicilicus (shekel)	double-*dirham*	48	4	1							6.82	6.66
sextula / *solidus*	*dinar*	72	6	1.5	1						4.548	4.438
drachma	*dirham al-kayl*	96	8	2	1.333	1					3.411	3.328
scrupulum (scruple)	¼ *dinar*	288	24	6	4	3	1				1.1370	1.1094
obulus	*daniq*	576	48	12	8	6	2	1			0.5685	0.5547
siliqua (carob)	*qirat*	1728	144	36	24	18	6	3	1		0.1895	0.1849
chalcus		4608	384	96	64	48	16	8	2.667	1	0.0711	0.0693
grana (grain)	*habbah*	6912	576	144	96	72	24	12	4	1.5	1	0.0474	0.0462

Sources: EI (1993) "*Dirham*" pp.978-979, "*Kirat*" pp.1023-1024; Entwistle (2002), p.611; Broome (1985), p.11; Grierson (1999), p.6

Table 2: Byzantine and Islamic Coins/Weights

Dynasty	Ruler	Mint (Year)	Coin/Weight	
Heraclian	Heraclius	Constantinople (610)	Full *solidus* 4.44g	
Heraclian	Heraclius	Constantinople (613)	Light-weight *solidus* 4.25g	
Umayyad	ᶜAbd al-Malik ibn Marwan	Damascus (697)	*Mithqal dinar* 4.25g	
Abbasid	Harun al-Rashid	Egypt (808)	*Mithqal dinar* glass weight (*sanja*) 4.25g	

Source: Amercian Numismatic Society (ANS, 2019)

3. Makkan *Mithqal*

In Rosenthal's translation of the *Muqaddimah*, Ibn Khaldun, the father of Islamic economics, observed: "It should be known since the beginning of Islam and the time of the Companions (*sahabah*) and the Followers (*tabiᶜun*), the legal *dirham* is by general consensus the one, ten of which are equal to seven *mithqal* of gold, and an ounce of gold is forty *dirhams*. Thus, the legal *dirham* is seven-tenths of a *dinar*. A gold *mithqal* weighs seventy-two average-sized grains of barley (*habbahs*). Consequently, the *dirham*, which is seven-tenths of a *mithqal*, has a weight of fifty and two-fifths grains. All of these values are accepted by general consensus" (Ibn Khaldun, 1958, 2, p.58)[3].

In Allouche's translation of the *Ighathah*, Al-Maqrizi, as a market prefect (*mustahib*), explained the weights of Makkah, that the *daniq* = 8.4 *habbah*, that the *daniq* = 2.5 *qirats*, the *mithqal* was 72 *habbahs* and the *dirham* 50.4 *habbahs*: "the *mithqal*, a weight for the *dirhams* and the *dinars*…[and]…the *ratl*, equivalent to 12 *uqiyyahs*, and the *uqiyyah*, equivalent to 40 *dirhams*. Thus, the *ratl* (of Makkah) would be equivalent to 480 *dirhams*…and one *nish*, which was one-half of one *uqiyyah*, was equivalent to 20 *dirhams*, and one *nawat* was 5 *dirhams*." (Al-Maqrizi, 1994, p.56). *Rasulullah* (s.a.w.s.) established the *nisab* for silver as 5 *uqiyyah*, upon which a *zakat*

[3] In Rosenthal's 1958 English translation of the *Muqaddimah*, he translates *habbahs* as 'grains of wheat' when it literally means 'grain' but refers to an average-sized, unshelled grain of barley, of which the extremities are cut, whereas the *qamhah* is the wheat grain (*c.f.* Al-Maqrizi, 1994, p.57).

of 5 *dirhams* (or one *nawat*) was fixed, and for every 20 *dinars* a *zakat* of ½ *dinar*, thus the *zakat* rate is 2.5%. Al-Maqrizi identified the weight of the *daniq* as "8 2/5th average unshelled *habbahs* [grains] of barley, of which the extremities are cut" (Al-Maqrizi, 1994, p.57), and "the *daniq* [was] two and a half *qirats*" (Al-Maqrizi, 1994, p.59). He noted that of the *bahgli*, *tabaris*, and *jawrafi dirhams*, the Persian *baghli* was also called the 'black of full weight' (*sud wafiya*) since it weighed the same as the *dinar*. Ten *jawaz dirhams* (a general term for the legal *dirham*) weighed 7 *baghlis* (or *dinars* or *mithqals*): "the weight of one *mithqal*…weighed 72 *habbahs*" of average unshelled grains of barley whose extremities are cut. (Al-Maqrizi, 1994, p.57), and "the weight of one *dirham* was fifty and two-fifths *habbahs*" (Al-Maqrizi, 1994, p.61).

In Fawzan Barrage's translation of *Al-Dawhat al-Mushtabakat Fi Dawabit Dar al-Sikkah*, Al-Hakim, an actual mint-master of Fas and a highly respected *faqih*, during the reign of the Marinid (Morocco) Sultan Abi `Anan Faris (748-759H), corroborates the view of Ibn Khaldun and Al-Maqrizi, that the *mithqal* was 72 *habbahs* or 24 *qirats*[4], explaining that this is the same weight as the *Shariᶜah mithqal*: "the Romans (Byzantine) continued to use the *dinar* and the Persians to use the *dirham*, until Islam came…The Persians had three different weights for the *dirhams*: one was one *mithqal*, which is twenty *qirats*, another was twelve *qirats* and yet another was ten *qirats*. When Islam came, the need arose to value the *zakat*, so an average of all three standards was used. The sum of all three standards added up to forty-two *qirats* so it was agreed that the *dirham* would be equal to fourteen *qirats* of the *qirats* of the *mithqal*, which is in turn twenty-four *qirats*. The *qirat* was also equal to three *habbahs* and twenty-four times three is seventy-two and that makes a *mithqal* seventy-two *habbahs*… It is also said that when ᶜUmar Ibn al-Khattab (r.a.), saw the discrepancy in the weight of the *dirhams*, he looked at the majority of what the people use from the lightest to the heaviest. He divided it into twelve *daniqs* and took half of that (six *daniqs*) to equal the *dirham*. Thus, when you add to the *dirham* three seventh of its weight it equals a *mithqal*, and when you take away three tenths off the weight of a *mithqal*, it equals a *dirham*" (Al-Hakim, 2001, p.2). In describing the history and inner working of the mint, Al-Hakim reported from Ibn Hazm al-Andalusi whom stated, "The Imam should order the people to transact between them with pure refined gold, and pure refined silver only[5]. The Imam is to recall all struck coins, smelt them and refine them. Then he is to strike new coins from the pure metal, and return these to their owners" (Al-Hakim, 2001, p.4).

In Wahba's translation of *Al-Ahkam al-Sultaniyya*, Al-Mawardi (974-1058), considered a judge *par excellence* (*aqda al-quda*), in Baghdad at the time of the ᶜAbbasids, also corroborates the account of Al-Hakim as to how the legal *dirham*, as a coin standard, was maintained by ᶜUmar (r.a.) amidst the declining state of Persian coinage:

[4] There is also a tradition related on the authority of Jabir, states that the Prophet (s.a.w.s.) said: "The weight of the *dinar* is 24 *qirats*" (Zayas, 2003, p.72).

[5] As in the case of the early Heraclian and Chosroes coins, the Muslims did not transact by nominal value by 'tale' (i.e. by face value or by their official legal value) but by 'specie' (by their intrinsic weight as bullion) and considered them only as ore (*tibr*), i.e. pure material of gold and silver: the various weights were used to prevent fraud. In order to avoid injustice, when Islamic *dinars* and *dirhams* were transacted by their nominal value they should reflect their intrinsic worth since the population automatically trusted the *sikkah* (the mint).

- "Now, the weight and quality of the dirham must be learned. Its weight has been fixed in Islam as six *daniqs*, and every ten *dirhams* weigh seven *mithqals*. There are different explanations for the reason why it was stabilized at that weight. It has been suggested, for instance, that *dirhams* were minted by the Persians in three weights: a *mithqal* or 20 carats, 12 carats and 10 carats. When a weight had to be considered for the purpose of paying the legal alms (*zakat*), the average weight, or the total of 42 carats divided by 3, was settled upon, and it equaled 14 carats. Islamic *dirhams* minted to match this average were then characterized as 10 per 7 *mithqals*, which is how it actually is. Others have argued that when ᶜUmar ibn al-Khattab (r.a.) noticed the variety of *dirhams* in use, including the Baghlite, which weighed 8 *daniqs*, the 4 *daniq* Tabarite, the 3 *daniq* Maghribite, and the 1 *daniq* Yemenite, he ordered a study of the versions most used by all classes of people from the highest to the lowest. They turned out to be the Baghlite and the Tabarite. Adding them up and dividing the total of 12 by 2, he arrived at 6 *daniqs* as the weight of the Islamic *dirham*. If you add to it 3/7th of its weight you get a *mithqal*, and the latter minus 3/10th yields a *dirham*; thus each 10 *dirhams* are equivalent to 7 *mithqals*, and each 10 *mithqals* are equal to 14 *dirhams* and 2/7th of one *dirham*. The quality has to be pure silver, for no debasing admixture enters into its determination." (Al-Mawardi, 2000, p.170).

In Nyazee's translation of *The Book of Revenue (Kitab al-Amwal)*, Abu 'Ubayd al-Qasim ibn Sallam (774-837), who was a judge and highly knowledgeable on jurisprudence, the *Sunnah* and history, at a time when the Hanafi school was established in Iraq, the Maliki school in Medinah and the Shafi'i school was just beginning to emerge in Syria and Egypt. Abu 'Ubayd had earlier provided a similar account on the Islamic currency to that of Al-Mawardi:

- "They used to make an assessment for the payment of *zakat* in two ways: separately from larger coins and from smaller coins. When they were about to commence minting of the *dirhams*, they examined the heavier *dirham* and found it to be 8 *daniqs*. Thereafter, they examined the samller *dirham* and found it to be 4 *daniqs*. They equalized the difference by combining the weight of the two and dividing into two equal *dirhams*, with each weight 6 *daniqs*. After this, they checked the weight of a *dirham* in terms of *mithqals*. The *mithqal* had remained of the same standard weight throughout. They took 10 of these *dirhams*, each with a weight of 6 *daniqs* and weighed them against *mithqals*. The weight came out to be exactly 7 *mithqals*…The *sunnah* about the *dirhams* was reaffirmed this way and the *ummah* arrived at a consensus, with no one disagreeing about the fact that the weight of the full *dirham* is 6 *daniqs*. When a *dirham* was found to differ, it was called heavier or a deficient *dirham*…The weight of the *dirham* prior this was 6 [*daniqs*] and this has been mentioned in some traditions. It has been related to me from Sharik from Sa'd ibn Tarif from al-Asbargh ibn Nubata from Ali', who said: 'The Messenger of God (s.a.w.s.) married me to Fatima (r.a.), for a sum of 480 *dirhams* with a weight of six [*daniqs*]'." (Abu 'Ubayd, 2003, pp.480-481).

4. Syrian *Mithqal*

The Syrian *mithqal* was 22 *qirats* less a *habbah*, or 22 *qirats* less a fraction. Al-Maqrizi stated, ᶜAbd al-Malik ibn Marwan "struck the *dinar* and the *dirham*: he set the weight of the *dinar* at 22 Syrian *qirats* minus one *habbah*, and that of the *dirham* at exactly 15 *qirats*, one *qirat* being equal to 4 *habbahs*, and one *daniq* at two and a half *qirats*…[he] struck gold (*dinars*) according to the Syrian *mithqal*. These were called the *mayyalah dinars* ('tilting' *dinars*), greater by two *dinars* per hundred" (Al-Maqrizi, 1994, pp.59-60). Since each Syrian *qirat* contained 4 *habbahs*, one Syrian *mithqal* thus equaled 87/88 *habbahs* or a nominal 21.75[6] *qirats*, which less 2% closely approximates the actual weight of 21 3/7th derived from the *dirham* at 15 *qirats* being 7/10th of the *mithqal*[7]. The Syrian *mithqal* of 21 3/7th *qirats* equaled the Makkan *mithqal* of 72 *habbahs* (Al-Maqrizi, 1994, p.57). Muhammad bin S'ad said, "The weight of these *dirhams* is 14 carats of the 20 carats of our *mithqal* which was 20 carats and it weighs 15 carats out of 21 3/7th carats" (Zalloom, 2002, p.168). Indeed, the coins minted by ᶜAbd al-Malik ibn Marwan were readily accepted by the Muslims - Waqidi quoted that Wahb bin Kaysan said: "I saw *dinars* and *dirhams*, before ᶜAbd al-Malik bin Marwan engraved and abraded them and they were the *dinar's* weight coined by ᶜAbd al-Malik" (Zalloom, 2002, p.167). It is also narrated from ᶜAbd al-Malik bin As-Saib from Abu Wada'a as-Sahmi that he showed him the weight of the *mithqal* saying: "I weighed it and found it the weight of ᶜAbd al-Malik bin Marwan's *mithqal*. He Said: This was owned by Abu Wada'a bin Dhabira as-Sahmi in *jahiliyyah*." (Zalloom, 2002, p.167). Al-Balathri narrated from Uthman bin Abdullah who said: "My father said: 'The *dinars* of ᶜAbd al-Malik bin Marwan came to Madinah where there were some of the *sahabah* of *Rasulullah* (s.a.w.s) and others from the *tabiᶜin*. No one rejected them'" (Zalloom, 2002, p.168).

- Al-Baladhri narrated from Abdullah bin Th'alaba bin Sa'eer who said: "Heraclian *dinars* came to the people in of Makkah in *jahiliyyah* as came *dirhams* of al-Furs al-Bughliyya (Persians), and when they traded with them they considered them only as ore. The *mithqal* had a well-known weight for them, a weight of 22 carats less a fraction. Ten *dirhams* weighed seven *mithqal* and the pound was 12 ounces with each ounce being 40 *dirhams*. The Messenger of *Allah* (s.a.w.s.) consented to this, as did Abu Bakr, ᶜUmar, ᶜUthman and ᶜAli." (Zalloom, 2002, p.165).
- According to Khalid b. Abi Rabi'ah from Ibn Hial from his father: "The pre-Islamic units of weight (*mithqals*) by which ᶜAbd al-Malik struck his coins were 22 *qirats*, minus a *habbah*; ten weight seven." (Al-Tabari, 1989, 22, p.91).
- According to 'Abd al-Rahman b. Jarir al-Laythi, from Hilal b. Usamah: "I asked Sa'id b. al-Musayyab how much the *zakat* should be on *dinars*, and he said: 'For every 20 *mithqals* in Syrian weights, a half *mithqal*.' I said, 'Why Syrian rather than Egyptian?' He replied, 'It is the Syrian that *dinars* are struck, and that was the weight of the (earlier) *dinars* before the *dinars* were struck; they were 22 *qirats* minus a *habbah*' Sa'id said, 'I know that, because I

[6] 87 *habbahs* / 4 *habbahs* per *qirat* = 21.75 *qirats*

[7] A *dirham* of 15 *qirats* / 0.7 = 21.428571 or 21 3/7th

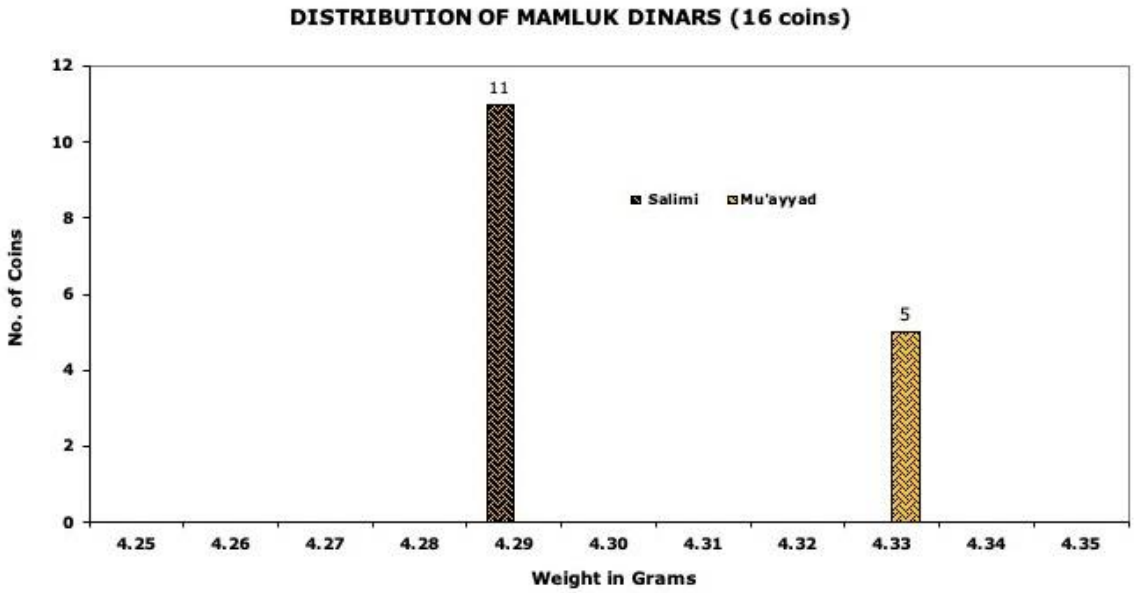
had sent some *dinars* to Damascus, and they were struck at that weight." (Al-Tabari, 1989, 22, pp.91-92).

5. Eqyptian *Mithqal*

We must differentiate between the legal and Egyptian *mithqal*, and also the coin standards of various dynasties. Although Bates states, "in Fatimid and Ayyubid Egypt, [the *mithqal*] was divided into 24 *qirats* and 72 *habbahs*" (Bates, 1981, p.78), in fact the *mithqal* weight varied depending on the type of grain. The legal *mithqal* was based on the barley grain (*habbah*), but the Egyptian *kharrubahs* was "equivalent to 3 *qamhahs* [wheat grains not barley grains] and the *mithqal* to 24 *kharrubahs*" (Al-Maqrizi, 1994, p.68). Al-Maqrizi clarifies that, "weight standards vary in Egypt and Syria: 100 Syrian *mithqals* weigh one and one-fourth *mithqal* less in Egypt, and this proportion is also true for the *dirhams*" (Al-Maqrizi, 1994, p.68). Ayyubid or Mamluk coin standards were based on an Egyptian *mithqal* that weighed 1.25% heavier than the Syian (legal) weights, and weighed 4.303g (= 4.25 x 1.0125) for the *dinar* and 3.012g (= 2.975 x 1.0125) for the *dirham*, as reflected in surviving glass weights (Schultz, 2003, pp.67-69). Notwithstanding the prevailing coin standard, Egyptian bronze weights have been discovered and correspond to the legal *mithqal* weight 4.25g and *dirham* 2.975g (Bates, 1981, p.79).

Given the importance of our analysis on the accuracy of metrology and numismatics in determining the exact Egyptian weight and coin standards, we present the following figures relating to individual hoards of coins and glass weights for *dinars*, *dirhams* and *fulus*, from the Mamluk period, and the surviving specimens indeed reflect the Egyptian *mithqal* that weighed about 4.3g and the *dirham* of about 3g. In figure 1, the combined average weight of 16 *dinars* is 4.303g revealing the intention to conform to the Egyptian *mithqal* standard, being 1.25% more than the legal *mithqal* weight of 4.25g. The 11 *Salimi dinars* struck in 804-805/1401-1403 average 4.29g; and the implied average *mithqal* weight of the 5 *Mu'ayyad* full *mithqal* and half (*nifs*) *mithqal dinars* struck in 821/1418-1419 is 4.33g.

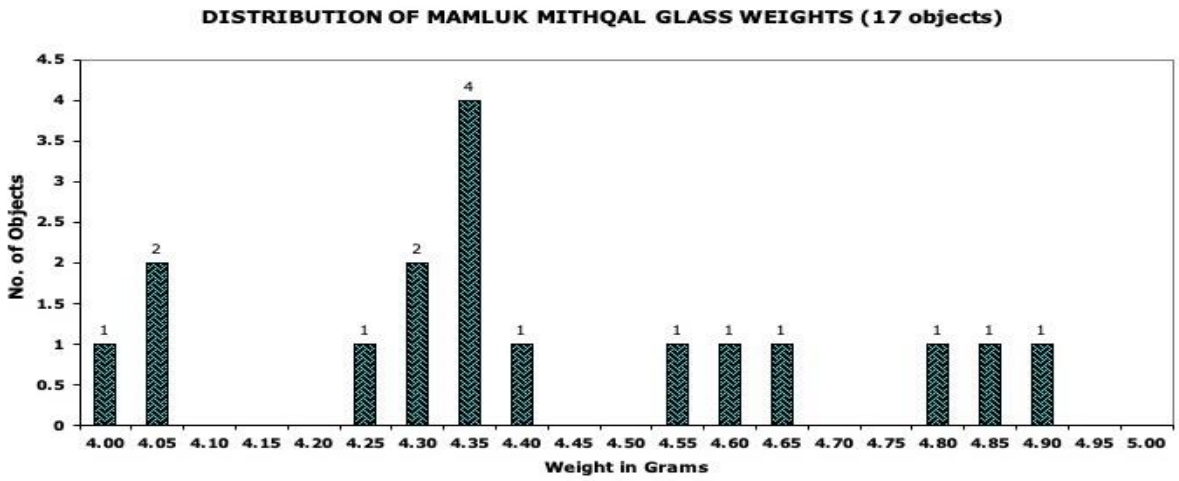
Figure 1: Distribution of Mamluk *Dinars* (16 coins)



Source: Schultz (2003, pp.61-62)

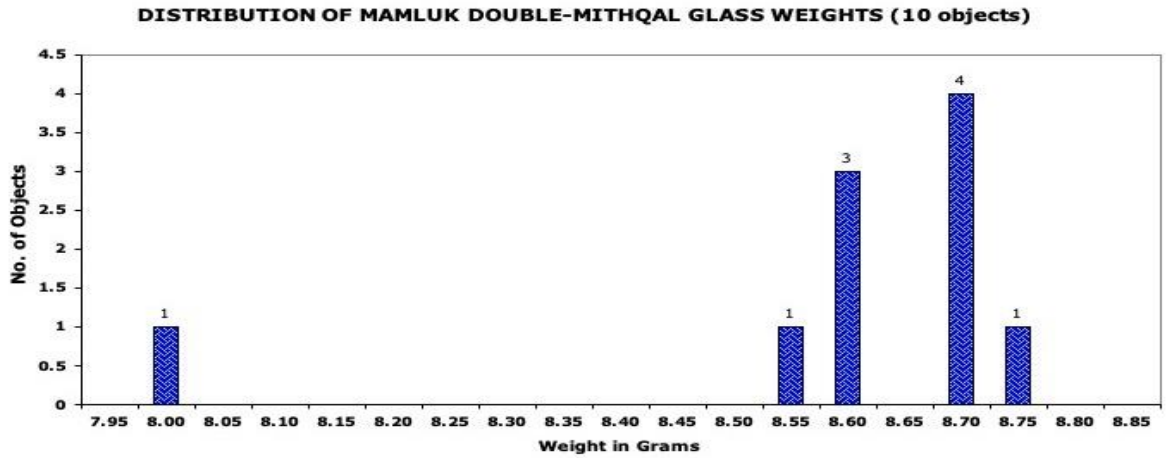
In figure 2, out of 17 objects, 7 glass *mithqal* weights (41%) with an average weight of 4.3g, are distributed within the range of 4.25 - 4.35g; and in figure 3, out of 10 objects, another 7 glass double-*mithqal* weights (70%) with an average weight of 8.6g, are distributed within the range of 8.55 - 8.70g. In figure 4, out of 77 objects, 65 glass half-*dirham* weights (84%) with an average weight of 1.5g, are distributed within the range 1.45 - 1.55g; in figure 5, out of 291 objects, 245 glass *dirham* weights (84%) with an average weight of 3g, are distributed within the range of 2.90 - 3.10g; and in figure 6, out of 379 objects, 323 glass double-*dirham* weights (85%) with an average weight of 6g, are distributed within the range of 5.80 - 6.20g.

Figure 2: Distribution of Mamluk *Mithqal* Glass Weights (17 objects)



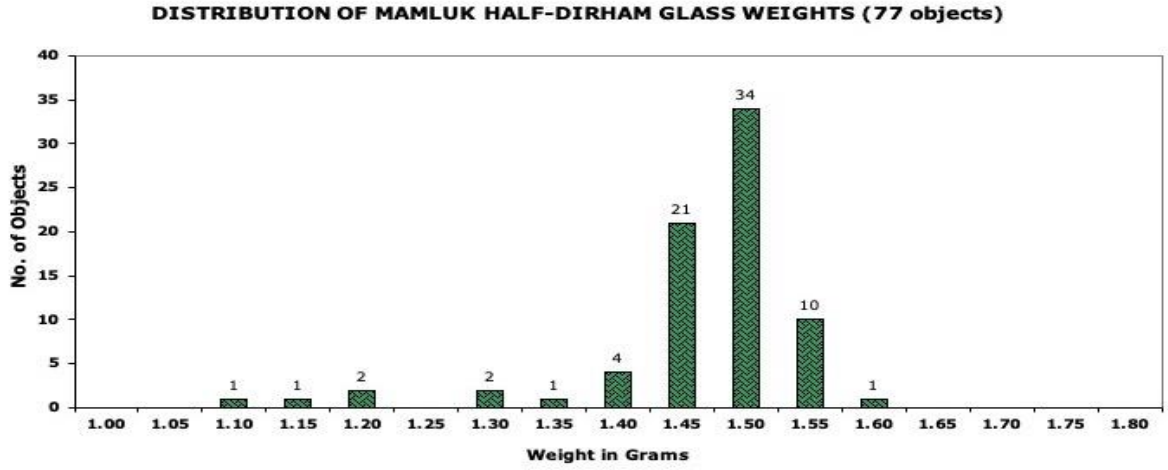
Source: Schultz (2003, p.70)

Figure 3: Distribution of Mamluk Double-*Mithqal* Glass Weights (10 objects)



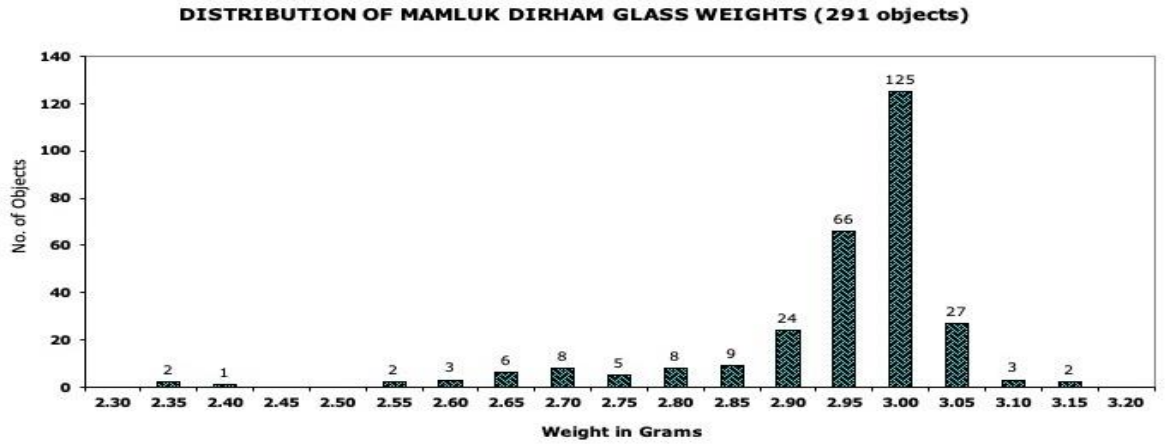
Source: Schultz (2003, p.71)

Figure 4: Distribution of Mamluk Half-*Dirham* Glass Weights (77 objects)



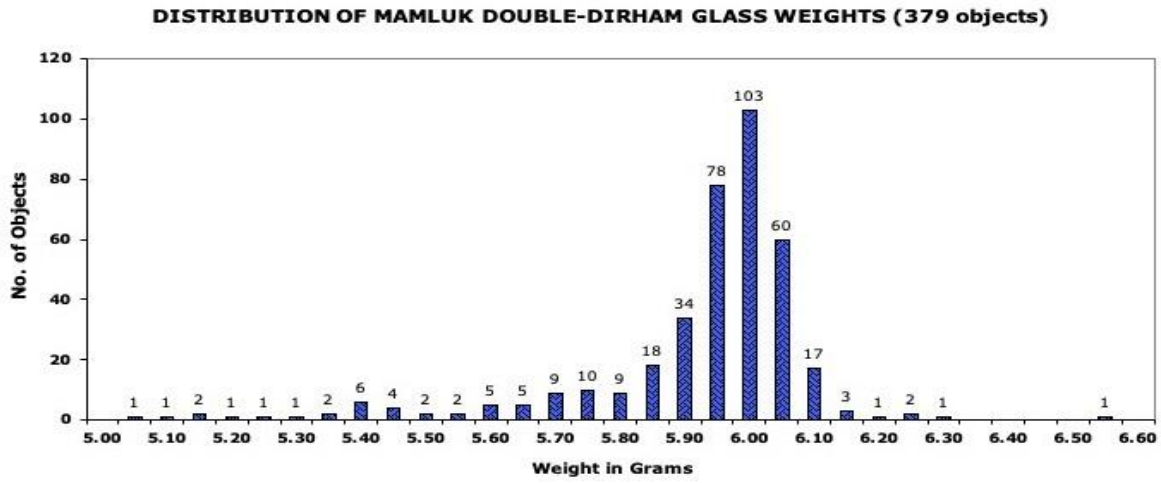
Source: Schultz (2003, p.67)

Figure 5: Distribution of Mamluk *Dirham* Glass Weights (291 objects)



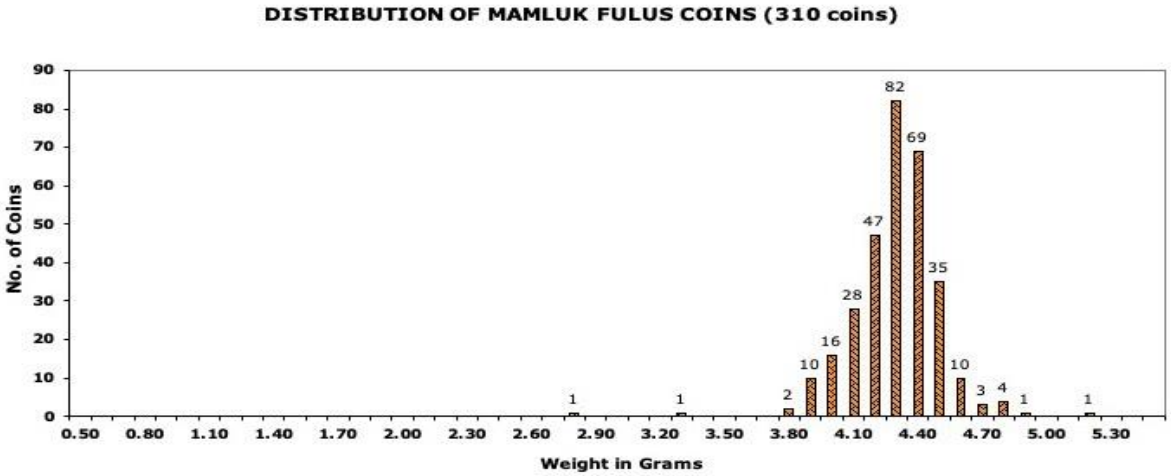
Source: Schultz (2003, p.68)

Figure 6: Distribution of Mamluk Double-*Dirham* Glass Weights (379 objects)



Source: Schultz (2003, p.69)

Figure 7: Distribution of Mamluk *Fulus* Coins (310 coins)



Source: Schultz (2003, p.63)

Finally, in figure 7, out of a hoard of 310 *fulus* that was minted in Cairo during the reign of al-Ashraf Nasir al-Din Sha'ban (764-778/1363-1376), 307 *fulus* copper coins (99%) with an average weight of 4.302g, are distributed within a tight bell-curve between 3.80 - 4.10g, falling within an interval of 1.10g. Chronicles report that, after 759/1357-1358, 1 *fals* = 1 Egyptian *mithqal* of 4.303g, and hence the intention was clearly to conform to Egyptian weights.

In 783H/1381-1382 seven copper coins were minted in Cairo, 6 of a full *uqiyya* weight and 1 of a half-*uqiyya* weight, with an implied average weight for the *uqiyya* of 34.86g. These coins have suffered some wear, however, in assessing for a reasonable adjustment for a loss in weights due to wear over time, Grierson suggested 1.5% for gold and 0.5% for glass (Grierson, 1960, p.254). Since 1 *uqiyya* = 12 *dirhams*, the *dirham* weight suggests 2.905g, and to obtain an Egyptian standard of 3.01g, one needs to adjust by 3.5% which is possibly too high for copper, and thus we probably require a larger number of specimens before arriving at any realistic conclusion

(Schultz, 2003, p.64), as to whether these coins reflected the Egyptian equivalent of the Islamic ounce.

Al-Maqrizi also mentioned that the *dirham kamali* (DK) was fixed at 18 *kharrubahs* (Al-Maqrizi, 1994, p.68) or 54 *qamhahs*, so that by weight the Egyptian *mithqal* was 1.333 (24/18 *kharrubahs* or 72/54 *qamhahs*) heavier that the Egyptian *dirham* in circulation, which we know from Al-Maqrizi's account, was the debased DK at 2/3 fine. Under the Ayyubids and Mamluks, the army *dinar* or *dinar jayshi* (DJ), a term derived from the *diwan al-jaysh*, was an important money of account used to determine the present value of agricultural land for land concessions (*iqta'*) granted by the Sultan for military service, in lieu of a stipend. The DJ was payable in cash and in kind and worth the equivalent of 2/3 of the Egyptian *dinar* (ED), being the same as the Egyptian *mithqal* (EM). On the basis of an exchange rate of 20 DKs to 1 ED, the DJ was also equivalent by value to 13.333 DKs. Moreover, the *dirham nuqra* (DN)[8] was an official money of account that evaluated the pure metallic value of ordinary circulating *dirhams*, and exchanged at 13.333 DNs to 1 ED (Rabie, 1972, p.48; Goitein, 1965, p.43; Ehrenkreutz, 1992, IX, p.503).

From an analysis of coin specimens held by the American Numismatic Society (ANS, 2019), the Fatimid coin standard for the *dinar* was about 4.19g (Ehrenkreutz, 1959, p.180), a short-weight noticed in Collin's translation of *Ahsan al-Taqasim fi Ma'rifat al-Aqalim*, by Al-Muqaddasi whom stated in 375H/985 that, "in all provinces of this region [the *Maghrib*], the standard is the *dinar*, which is lighter than the *mithqal* by a *habbah*, that is to say a grain of barley…The *dirham* is also short in legal weight…[coins] circulate by number [rather than by weight]" (Al-Muqaddasi, 2001, pp.198-199). A *mithqal* weighing 4.25g less a *habbah*, or 71/72 of the *Shari*^{c}*ah mithqal*, equals exactly 4.19g.

6. Iraqi *Mithqal*

Al-Maqrizi also states that the *mithqal* is a weight that has not changed since ancient times and was the equivalent of 60 *habbahs*, where each *habbah* weighed 100 grains of wild mustard (*khardal*), hence a *mithqal* weighed 6,000 *khardal*. The weight of the *dirham* was also 60 *habbahs*, but each *habbah* weighing 70 *khardal*, so that the weight of the *dirham* was 4,200 *khardal*, being 7/10th of a *mithqal* (Al-Maqrizi, 1994, pp.57,62). In following the Iraqi practice of dividing the *mithqal* into 60 *habbahs*, "the 11th century treatise of Eliya Bar-Sinaeus, Archbishop of Nisibin[9], *Maqala fi'l-awzan wa'l-makayil*, translated by Henri Sauvaire in 1877 and 1880…describes the

[8] With 1 DJ being equal to 2/3 of an ED (or EM), and a prevailing ED:DK exchange rate of 20:1, for a coin of the purity of a *kamlili dirham* (*dirham al-nuqra al-kamiliyya*), the DJ = 13.333 (20 x 0.666). Not all the *dirhams* in circulation were of 3g and 2/3 purity such as the DK, for some were of lower fineness and many were fractions. The DN was not the same as the DK as Borsch suggests (Borsch, 2005, pp.159-159 citing Schultz 1995, pp.147-149,163,234-224), but rather the DN was adopted as a monetary standard of account, to evaluate the metallic content of a coin, and used in other official capacities, for the evaluation of government salaries, in *waqf* documents and in legal documents as suggested by Goitein (1965, pp.35,37,43,46) and Ehrenkreutz (1992, IX, p.503). At 13.333 DN:1 ED, the DK weighed 3g with 2g of pure silver or .666 fine, and its pure silver (*fidda al-nuqra*) content would have a value of 13.333 / .666 = 20. The gold:silver ratio for either the DK or the DN was therefore, 2g x 20 / 4.3g for the DK, or, 3g x 13.333 / 4.3 for the DN = 9.3

[9] Nisibin is the modern Nusaybin in south-east Turkey, an ancient Assyrian city in upper Mesopotamia, close to the modern Turkish-Syrian border, within Kurdistan.

procedure for making a set of weights for *mithqals* and *dirhams*, For *mithqals*, one begins with 100 mustard seeds, the weight of a gold-*habbah*, and makes from these a bronze weight for 1 *habbah*…using smaller weights in combination as the standard for larger weights, one makes a complete set…A set of *dirhams* weights is made the same way, beginning with a silver-*habbah* of 70 instead of 100 mustard seeds" (Bates, 1981, p.78).

Again, the weight of the *habbah* would not be the same weight of *habbah* expressed in the Egyptian, Syrian or Makkan *mithqals*, but nonetheless, the legal *mithqal* should weigh the equivalent of 6,000 *khardal*, and similarly the *dirham* weighs 4,200 *khardal*. The pre-Islamic Iraqi *mithqal* is distinct from Islamic ᶜAbbasid dynasty (ruling from Baghdad), although some of their coins were light by one, two or even three *habbahs*, until the reign of Abu Ja'far al-Mansur (136-58H/754-75) whom minted *hashimi dirhams* according to the Basra *mithqal*, which was set according to the weight of Syrian *mayyalah mithqal* (Al-Maqrizi, 1994, p.63) at 21 and 3/7th *qirats*.

Tables 3 and 4 summarize historical coin and weight standards.

Table 3: The *Mithqal* in Relation to Historical and Modern Weights

***Mithqal* Weight**	**Historical and Modern Weights**
Legal *Mithqal*	4.25g of 20 *qirats* = 0.2125g per *qirat* 4.25g of 8 *daniqs* = 0.53125 *habbahs* per *daniq* for gold 4.25g of 72 *habbahs* = 0.0590277g per *habbah* 4.25g / 6000 *khardal* = 0.0007083g per *khardal* 6,000 *khardal* / 72 *habbahs* = 83.33 *khardal* per *habbah* *dirham* is 7/10th of 20 *qirats* = 14 *qirats* *dirham* of 2.975g of 6 *daniqs* = 0.495833g per *daniq* of silver
Syrian *Mithqal*	4.25g of 21.428571 *qirats* = 0.1983g per *qirats* 22 *qirats* of 4 *habbahs* per *qirats*, less 1 *habbah* = 87 *habbahs* *mayyalah dinars* of 21.75 *qirats* (87 *habbahs* / 4 *habbahs* per *qirat*), less 2% approx. = 21 3/7 *qirats* *dirham* = 15 *qirats* being 7/10th of the *mithqal*
Egyptian *Mithqal*	4.303g of 24 *kharrubahs* = 0.1793g per *kharrubah* Egyptian *mithqal* = 72 *qamhahs* or 24 *kharrubahs* (3 *qamhahs* per *kharrubahs*) Al-Maqrizi: Egyptian *mithqal* > Syrian *mithqal* by 1.25% Ayyubid, Mamluk coin standard = 4.303g (4.25 x 1.0125) Al-Muqaddasi: *Maghribi dinar* = legal *mithqal* less one *habbah* or 71/72 *habbah* Fatimid *dinar* standard = 4.25g / 72 x 71 = 4.19g
Iraqi *Mithqal*	4.25g of 60 *habbahs* = 0.0708333g per *habbah* one gold *habbah* = 100 mustard seeds (*khardal*) one silver *habbah* = 70 *khardal* *mithqal* = 60 *habbah* x 100 *khardal* = 6,000 *khardal* *dirham* = 60 *habbah* x 70 *khardal* = 4,200 *khardal* 4.25g of 6,000 *khardal* = 0.0007083g
Byzantine *Solidus*	theoretically about 4.55g of 24 *siliqua* = 0.1895833g per *siliqua* or carat early Byzantine pound = 327.45g; by 6th-7th century fell to 322g, then to 320g with devaluation of the pound, the *siliqua* no longer weighed a carob seed
Heraclian *Dinar*	the pound fell to about 320g by 7th century as per weights in British Museum the reduced *solidus* was a full *solidus* less a *siliqua*, tariffed at 1/72 of a pound the reduced *solidus* = the *mithqal*, and used for trade with the Orient hence the reduced *solidus* of 24 *siliqua* = 0.1770833g per *siliqua* or carat

Table 4: The *Dinar* and *Dirham,* and Regional Coin and Weight Standards

										Heraclius (Byzantine) ***dinar***
An-Nuqud & the Sassanian *drachma* of Khosrau II	Weight in ***Mithqals***	**Legal** ***Qirat***	**Legal** ***Daniq***	**Syrian** ***Qirat*** 2½ *qirats* to 1 *daniq*	Weight in ***Habbahs*** barley grains	**Egyptian** ***Qirat*** 3 *habbhas* to 1 *qirat*	**Iraqi** ***Mithqal*** = 60 *habbahs* (h) 1 gold h = 100 k 1 silver h = 70 k *khardal* (k) wild mustard seeds	Weight in **grams**	1 pound = 72 **full** ***solidus*** of 24 *siliqua* (carobs) in grams	*mithqal* = **reduced** ***solidus*** of 23 *siliqua* (carobs) in grams
legal ***dinar***	1	**20**		21 3/7	72	24	6000	4.25	4.44	4.25
Baghli (the mule)	1	20	8							
Juwariqiyya Dirham (from Jurqan)	3/5	12								
Tabri (from Tabaristan)	1/2	10	4							
legal dirham	7/10	**14**	**6**	15	50 2/5	16 4/5	4200	2.975		

Table 5 specifically highlights the differences between the 'full' and 'reduced' *solidus*. Orientalists often argue that Muslims merely copied the Byzantine *dinar*, but the *mithqal* preceded the Romans. The Muslims never used actual carob seeds to weigh gold and silver, but barley grains, and ultimately it was the Byzantines that reduced their *solidus* to trade with the Persians and the Arabs.

Table 5: Full and Reduced *Solidus* of Heraclius

Heraclian *Dinars*	Pound (grams)	*Solidus* per pound	*Solidus* (grams)	*Siliqua* per *Solidus*	*Siliqua* (grams)
Full *Solidus*	320	72	4.44	24	0.185
Reduced *Solidus*	306	72	4.25	23	0.185

Sources: Broome (1985), pp.11,12,14; Grierson (1999), p.6; Entwistle (2002), p.611

Another interesting aspect of metrology is the underlying synergy of the *dinar*, *dirham*, *mithqal* and *daniq* in every ancient currency. The Persian *daniq* was not only a weight but also a small coin, exactly similar to the Greco-Roman *obol*: 6 *daniqs* or 6 *obols* being equal to 1 Sassanian *drahm* or Attic *drachma*. Also, the *shekel* meaning 'weight' has its roots in Mesopotamia, the Akkadian '*she*' meaning 'barley', with the half *shekel* being the weight of the *mithqal*. Since Britain and France (Gaul) were former Roman provinces, the British pound has the Roman abbreviation for *L* (*libra*) with a stroke through it, and £1 = 240 pennies; also 'shilling' came from the word *solidus*, and the pennyweight (pwt or dwt), with abbreviation 'd' from the silver *denarius*. English coinage was derived from the French Carolingian reform, which spread under King Charlemagne to the Saxon kingdom of Mercia under King Offa (757-796), and thus, £1 = 20*s*, each containing 12*d* (and the half penny equaled the *obol*). Each penny initially weighed 30 wheat grains under the Tower pound, up until 1527 when the Troy system was adopted and each penny weighed 24 barley grains.

7. Makkan Weights

We may summarize the Makkan weights with their modern metric counterparts as follows;

1 legal *mithqal* / *dinar* = 20 *qirats* = 8 *daniqs* = 72 *habbahs* = 6,000 *khardal* = 4.25g

1 legal dirham = 14 *qirats* = 6 *daniqs* = 50.4 *habbahs* = 4,200 *khardal* = 2.975g

hence 7 *mithqals* = 10 *dirhams*, so 7 x 4.25 = 29.75g

and 10 *dirhams* = 7 *mithqals*, so 10 x 2.975 = 29.75g

1 legal *qirat* = 4.25 / 20 or 2.975 / 14 = 0.2125g

1 legal gold *daniq* = 4.25 / 8 = 0.053125g

1 legal silver *daniq* = 2.975 / 6 = 0.4958333g

1 legal *habbah* = 4.25 / 72 or 2.975 / 50.4 = 0.059028g

1 *uqiyyah* of 40 legal *dirhams* = 40 x 2.975 = 119g

1 *nish* = ½ of 1 *uqiyyah* = 20 *dirhams* = 20 x 2.975 = 59.5g

1 *ratl* of 12 *uqiyyahs* = 12 x 40 = 480 *dirhams* = 480 x 2.975 = 1,428g

5 *uqiyyahs* = *nisab* for silver = 200 *dirhams* = 200 x 2.975 = 595g

1 *nawat* = *zakat* on silver[10] = 5 *dirhams* = 5 x 2.975 = 14.875g

Legal exchange rate for *zakat* = 10 *dirhams* to 1 *dinar*, and the *nisab* for gold = 20 *dinars* = 85g, thus, the *zakat* on gold[11] = ½ *dinar* = 2.125g

8. *Dirham* Weight

With respect to the *dirham* weight, an analysis is warranted as to its accurate weight, for some writers, perhaps influenced by orientalists, have sought to differentiate between the legal silver *dirham* and a *dirham* weight. The silver *dirham* is referred to as the *dirham al-kayl*, or the *dirham of measurement*, since the legal *ratl*, *sa*^{c} and *mudd* are multiples of it (Al-Maqrizi, 1994, pp.61,87.90), where 1 *mudd* = ¼ *sa*^{c} = 1 1/3rd (Baghdadi) *ratls*. Nonetheless, some have given varying estimates for the *dirham* weight: Zalloom (2000, p.54) stipulates 3.17g (thereby arriving at 408g for the Baghdadi *ratl*, and the same figure as Al-Qardawi, 2005, p.239). Allouche (1994, p.89) suggests 3.186g, based on Popper (1957,16:39) whom cites 3.186g and 3.148g from Zambaur (EI, 1993, pp.978-979,1023-1024), with an average of 3.17g; the French Commission cites 3.0884g in 1799 and 3.0898g in 1845 (Sauvaire, 1884, 4, p.317); and Popper (1957,16, p.39) cites 3.12g in Egypt or 3.2g in Palestine and Syria from Baedeker. Whilst the *ratl* (of 12 *uqiyyahs*) in Makkah was 480 silver *dirhams* (of 2.975g), in Cairo the *ratl* (pound) was 144 *dirhams* of the time (Al-Maqrizi, 1994, p.56). Atiya stated 1 *ratl* of 144 *dirhams* weighed 499g in modern Egypt, with each *dirham* weighing (1/144 of 449) 3.12g (Popper, 1957,16, p.39; EI, 1993, p.1129).

Notwithstanding, various weights assessed by the orientalists, the important determinant for the weight of the legal *dirham* was the legal *mithqal*, since post-reform by Umar ibn Al-Khattab (634-644) the legal *dirham* weighed 7/10th of the *mithqal*. The legal *mithqal* or *dinar* weighed 72 *habbahs* or 4.25g and the legal *dirham* weighed 50.4 *habbahs* or 2.975g. As mentioned, the *mithqal* weight was also evident in earlier civilizations, such as the silver coinage of Ancient Greece and Persia. In particular, table 6 presents the *mithqal drachma* of Alexander the Great (336-323 BC) and similarly of the Sassanian rulers Yazdegerd II (438-457) and Khusrau II (590-628). At the time of the Prophet (s.a.w.s.), the *dirhams* reflected the weight standard of the Sassanian *drahm* of Khusrau II that circulated in Makkah and Madinah. As cited by Al-Mawardi and Abu

[10] "No *zakat* is due on property mounting to less than five *uqiyyahs* (ounces of silver)" (Bukhari 24:487) and "for silver the *zakat* is one-fortieth" (Bukhari 24:534)

[11] From al-Hassan ibn ^{c}Umar through ^{c}Ali that the Prophet (s.a.w.s.) said, "bring forth the *zakat* on gold [at the rate of] one-half *dinar* for every twenty *dinars*" (Ibn Rushd, 2003, 1, p.297)

Ubayd, during the Rashidun Caliphate, the *dirhams* were reformed by Umar ibn Al-Khattab (634-644), although the earliest surviving dated Arab-Sassanian *dirham* was minted from the coinage of Yazdigird III (632-651) by Uthman bin Affan (644-656), engraved with *Bismillah* (in the name of *Allah*), in the year 651/31AH (Broome, 1985, p.5).

Table 6: Greek, Persian, Arab-Sassanian and Islamic *Dirham* Coins

Dynasty	Ruler	Mint (Year)	Coin	
Macedon	Alexander III (Alexander the Great)	Colophon (320 BC)	*drachma* 4.23g	
Sassanian	Yazdigird II	Ardashir (450)	*drahm* 4.25g	
Sassanian	Khusrau II	Jayy (Isfahan) (627)	*drahm* 4.24g	
Rashidun Caliphate	Uthman bin Affan (Yezdigird III)	Sijistan (651)	*drahm* 3.0g	
Umayyad	ᶜAbd al-Malik ibn Marwan	Damascus (699)	*dirham* 2.975g	

Source: Amercian Numismatic Society (ANS, 2019)

Conclusion

In this study, we have clarified the nature of the Islamic monetary standard. Ibn Khaldun (1958) and Al-Maqrizi (1994) both warned Muslims against abandoning the Islamic currency. Ultimately, the ᶜAbbasids lost their caliphate to the Ottomans in 1517 as a result of currency mis-management and manipulation through debasement and devaluation with *fiat* (copper) money (Abdullah, 2016). The Ottomans similarly lost their Caliphate to paper money and external debt (Abdullah, 2013, Mar.). Given a continuous cycle of financial crises in modern times, we should equally reflect on the consequences of avoiding a currency with intrinsic value. At a personal level, our wealth and assets are being eroded. We calculate the *nisab* (of 85g of gold) according to the equivalent price of gold in *fiat* (paper) money, in order to determine whether our assets in nominal terms are *zakatable*. If we first calculated *zakatable* wealth in real terms in terms of gold, then since 1971 the gold price has risen from USD 35/oz

to about USD 1,250/oz, and we would soon realize that in real terms, the value of our wealth and the value of the *zakat* in terms of *fiat* currency have both essentially collapsed. The positive effect of *zakat* in lifting the poor out of poverty has been entirely lost due to exponential decay in the value of money (reflected in its higher rate of exchange with a fixed amount of gold), as a result of an excessive increase in the supply money (generated by the modern banking system and the combined deposit and lending rates of interest), in relation to the demand for money, the effect of which is an increase in prices. This Islamic monetary theory of value (Abdullah, 2016), takes into account value, supply and demand, such that the cause is the decline in the value of money and the effect is price inflation. Since interest rates and prices are positively correlated, we are forced to lower our standard of living to pay for higher prices, such that our wealth is being confiscated through inflation and transferred to the combined profit-and-loss statement of the banking system. The fiat standard is money backed by debt, and is being exponentially devalued by aggregate interest rates (*riba*). Absent of usury, our medium of exchange would increase in value and purchasing power, thus lowering prices. Interest is a circular argument: it does not protect the value of money – it devalues it. When we pause to reflect, how can a nation hope to increase its wealth, increase its means of paying others, by charging interest upon itself. Our current monetary system involves debt at interest organized into currency and is not sustainable. Accordingly, we should to appreciate the importance of the Islamic monetary standard, and recognize that it was the once and is also the future of money, as the Prophet (s.a.w.s) has foretold, "A time is certainly coming over mankind in which there will be nothing (left) which will be of use save a *dinar* and a *dirham*" (Imam Ahmad ibn Hanbal, *Musnad*).

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