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Official and Private Weights and Measures (*Duliangheng* 度量衡) during the Qing Dynasty and Contemporary Perceptions

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ABSTRACT

There was little consensus among the Qing leadership—which comprised emperors, provincial officials, and the gentry—regarding policy issues arising from the official and private practices of weights and measures. Spearheading a reform initiative seeking to unify weights and measures, the Kangxi Emperor became personally involved in the definition and dissemination of new standards through government publications. However, with later policy proposals tending to limit the scope of this initiative, a more cautious approach was adopted. While the rigorous enforcement and stringent supervision of the official standards sought to eliminate the dishonest practices of merchants, who defined and used weights and measures for selfish gains, reservations soon emerged that the government's interventionist approach might disrupt existing market customs.

Keywords: weights and measures (*duliangheng* 度量衡); official and private; Qing dynasty; commercial customs; basic units for length, capacity, and weight: *chi* 尺 (foot), *sheng* 升 (pint), and *jin* 斤 (catty)

Introduction

Sellers and buyers use weights and measures (*duliangheng* 度量衡) to determine the values of commodities in an objective and fair manner in order to guarantee the credibility of commercial transactions. Political entities in China had long pursued the simplification and standardization of weights and measures through regulation and control. By developing systems for weights and measures, states brought order and stability to both the official and private transactions of goods.

With the rise of the centralized state in ancient China, the need for regulations on weights and measures became indispensable to the state's control over market transactions, as described in Chinese classics such as the “Wangzhi” 王制 chapter in the *Liji* 禮記 (Record of rites) and “Diguan” 地官 chapter of the *Zhouli* 周禮 (Rites of Zhou). However, it is unclear to what degree such classical descriptions represent the historical realities of the evolving systems of weights and measures in ancient China. By the time of the Qin empire, state control over weights and measures had become a matter of course, as verified by the detailed regulations on manufacturing and the supervision thereof contained in the “Gonglü” 工律 and “Xiaolü” 効律 sections of the *Qinlü* 秦律 (Qin law), and which appear on the recently excavated *Shuihudi Qinmu zhujian* 睡虎地秦墓竹簡—that is, the bamboo slips discovered in the Qin tombs at Shuihudi.¹ Thereafter, the

Tanglü 唐 (Law code of the Tang dynasty) stipulated punishments for the private manufacture and use of several weights and measures: namely, the *hu* 斛 (bushel), which was used to measure grain; *dou* 斗 (peck), which was used to measure rice; *cheng* 秤, a steelyard balance; and *du* 度, a measurement of length.² These weights and measures were maintained in the *Great Ming Code* (*Da Ming lü* 大明律 or *Minglü* 明律) and *Great Qing Code* (*Da Qing lü* 大清律 or *Qinglü* 清律) with some modifications. Nonetheless, it is important to recognize that such state regulations represent only the official aspect of the complex practices of Chinese weights and measures.

Douglass North, an economist, defines institutions as “any form of constraint that human beings devise to shape human interaction.” Intended to reduce uncertainty and structure daily life, institutions can be understood as “a guide to human interaction.”³ In this respect, North notes that “institutional constraints” can be formal or informal: whereas formal constraints are based on formal rules devised by society, informal constraints include various “codes of conduct, norms of behavior, and conventions.” North emphasizes the significance of informal constraints in our daily interactions with others, including our families, social relations, and business activities. In other words, rather than formal rules, informal constraints are often “the obvious and immediate source of choice in daily interactions.”⁴ Drawing on the division between formal and informal constraints, this article evaluates both the formal and informal aspects of Qing weights and measures in an effort to illustrate the relations between government regulations and specific practices in private transactions.

The Management of the System of Weights and Measures by the Qing Government

Initially built on the Ming system of weights and measures (*duliangheng*),⁵ the Qing government introduced a number of new institutions in establishing its own system.⁶ This section describes those institutions and their standard units of

¹ 睡虎地秦墓竹簡整理小組, *Shuihudi Qinmu zhujian* 睡虎地秦墓竹簡 [Bamboo slips from the Qin Tombs at Shuihudi] (Beijing: Wenwu Chubanshe, 1978), 69–70, 101. For the regulations on weights and measures of ancient China, see Ch'oe Tökkyöng 崔德卿, “Chin Han sidae toryanghyöng üi ch'öböl kyujöng kwa saenghwal üi kangje” 秦漢時代度量衡의 處罰規定과 生活의 強制 [Penal regulations on the weights and measures of the Qin and Han period, and enforcement of the weights and measures in life]. *Chungguksa yön'gu* 中國史研究 8 (2000).

² *Tanglü shuyi* 唐律疏義 [Commentaries on the Tang Code] (Beijing: Zhonghua Shuju, 1983), 499:

“諸私作斛斗秤度不平, 而在市執用者, 笞五十, 因有增減者, 計所增減, 準盜論。

即用斛斗秤度出入官物而不平, 令有增減者, 坐贓論。入己者以盜論。其在市用斛斗秤度雖平, 而不經官司印者, 笞四十。” For the government control of weights and measures during the Tang era, see Denis C. Twitchett, “The T'ang Market System,” *Asia Major* (New Series) 12, no. 2 (1966), 202–248.

³ Douglass C. North, *Institutions, Institutional Change and Economic Performance* (Cambridge: Cambridge University Press, 1990), 3–4.

⁴ *Ibid.*, 36–40.

⁵ For the practices of weights and measures during the Ming, see Zheng Zhonghui 鄭中慧, “Zhengzhou Rongyang nishui gongshe faxian Mingdai tongfama” 鄭州榮陽汜水公社發現明代, *Wenwu* 文物 (1978), 96.

⁶ Wu Chengluo 吳承洛, *Zhongguo duliangheng shi* 中國度量衡史 [History of Chinese weights and measures] (Beijing: Shangwuyin Shuguan, 1937), 252.

measurement as laid out in the newly compiled legal code, which reflected new adjustments while largely retaining the framework of the Ming system.

Regulations for the Standard Units

The Qing government used *du* 度 units as a linear measure. Insofar as the other measuring instruments for capacity and weight were devised on the basis of the *du*, it was regarded as the basic category of the new system of weights and measures.⁷ The *chi* 尺, equal to 1 foot, was the basic unit of length, with longer and shorter units produced using the decimal system. Therefore, 1 *zhang* 丈—equivalent to 1 yard—equals 10 *chi* (feet); 1 *chi* equals 10 *cun* 寸, which is equivalent to 1 inch; and 1 *cun* equals 10 *fen* 分, equivalent to 1/10 of an inch. The *Da Qing huidian* 大清會典 (Collected Qing statutes) stipulates two standard *chi* 尺: the *yingzao chi* 營造尺 or “construction foot rule,” which was used for construction under the guidance of the Board of construction; and the *lü chi* 律尺 or “harmonics foot rule,” which was used for music and, on rare occasions, rituals.⁸ In addition, private individuals could use the *caiyi chi* 裁衣尺 or “tailor’s foot rule”—in which, 1 *yingzao chi* = 9 *cun* of *caiyi chi*. The extant specimens of official *chi* 尺 from the Qing period are 32 cm on average.⁹

Liang 量 units were used to measure capacity, with the *sheng* 升—equivalent to a pint—constituting the basic unit. The larger units were as follows: 10 *sheng* 升 equals 1 *dou* 斗 (peck), while 5 *dou* 斗 equals 1 *hu* 斛—the equivalent of half a bushel in the Ming and Qing; therefore, 2 *hu* 斛 equals 1 *shi* 石 (bushel).¹⁰ In this respect, the Qing government introduced two types of capacity measuring instruments: *hubu liang* 戶部量¹¹ and *jialiang* 嘉量, which provided two scales for measuring capacity. The *hubu liang* was referred to as *canghu* 倉斛, a grain storage measurement equivalent to half a bushel. With the prototype made of iron, the *hubu liang* was distributed across the country as the official standard. The extant example, called “*hubu tie fang sheng*” 戶部鐵方升 (“iron square pint of the Board of Taxation”), matches the specification stipulated in the *Da Qing huidian* and has a capacity of 1,035 cm³. The capacity of the *hu* 斛 preserved at the Chenghuang

⁷ He Changling 賀長齡, and Wei Yuan 魏源, eds, *Huangchao jingshiwen bian* 皇朝經世文編 [Collected essays about statecraft of the Qing] 卷56, 張照「論樂律及權量疏」(Beijing: Zhonghua Shuju, 1992): “古法累黍定度, 度立而量與權衡準焉。”

⁸ *Jiaqing Da Qing huidian* 嘉慶大清會典 [Collected Qing statutes in the Jiaqing era], 卷15, 「戶部」5: “俗用裁衣一尺, 營造尺一尺一寸一分一釐一毫, 律尺一尺三寸七分一釐七毫。營造尺一尺, 裁尺九寸, 律尺一尺二寸三分四釐六毫。律尺一尺, 裁尺七寸二分九釐, 營造尺八寸一分。”

⁹ Chūgoku kokka keiryō sōkyoku, ed., 中国国家計量総局主編, Yamada Keiji 山田慶児, trans. *Chūgoku kodai doryōkō zushū* 中国古代度量衡図集 [Collection of illustrated weights and measures of ancient China] (Tokyo: Misuzu Shobō, 1985): ① 康熙帝 象牙製一尺物差 (中國歷史博物館所藏, 營造尺 32 cm, p. 66) ② 象牙象嵌 木製一尺 (故宮博物館所藏, 營造尺 32cm, p. 66) ③ 象牙象嵌 木製一尺 (故宮博物館所藏, 營造尺 32.16 cm, p. 68) ④ 象牙製一尺 (中國歷史博物館所藏, 32.03 cm, p. 68) ⑤ 山水人物牙尺 (中國歷史博物館所藏, 35.26 cm, p. 70).

¹⁰ One *hu* 斛 had been equal to ten *dou* 斗, but was redefined from the late Yuan as 5 *dou*, hence, half a bushel. See Endymion Wilkinson, *Chinese History: A New Manual* (Cambridge, Massachusetts and London: The Harvard University Asia Center for the Harvard-Yenching Institute, 2012), 555.

¹¹ *Jiaqing Da Qing huidian* 嘉慶大清會典, 卷15, 「戶部」5: “戶部量鑄鐵爲式, 方升積三十一寸六百分, 面底方四寸, 深一寸九分七釐五毫。”

Shrine in Shanghai is four percent less than the capacity stipulated in the *Da Qing huidian*.¹² Meanwhile, the *jialiang* 嘉量 or “ideal capacity” was made in emulation of the Han 漢 model during the Qianlong 乾隆 era (1736–1795) for ritual purposes. In this regard, 10 *dou* 斗 of *jialiang* is equal to 2 *dou* 斗 and 7 *sheng* 升 of *canghu* 倉斛.¹³

Heng 衡 units were used to measure weight, with one cubic *cun* 寸 (in *yingzao chi* 營造尺) of metal serving as the standard weight. The *jin* 斤 (catty) constituted the basic unit of weight. The lighter and heavier units were produced as follows: 1 *qian* 錢 (mace) equals 10 *fen* 分, 1 *liang* 兩 (ounce) equals 10 *qian* 錢, 1 *jin* 斤 (catty) equals 16 *liang* 兩, and 1 *shi* 石 (picul) equals 120 *jin* 斤. The instrument used to measure weight was called *kuping* 庫平 and was preserved by the Board of Taxation.¹⁴

Weighing instruments belonged to one of two categories: *quan* 權 or *heng* 衡. The *heng* category referred to the *tiancheng* 天秤 or balance scale, in which the object to be weighed was placed in one pan while the weights (usually bronze ones known as *fentong* 分銅) were placed in the other. When the balance arm was level, the weights were counted. The *quan* category referred to the *zhuocheng* 棹秤 or steelyard balance scale, which determined the weight of an object by suspending it from the shorter arm of the beam while a counterbalance (*chui* 錘 or *fentong* 分銅) made of copper was moved along the graduated scale on the longer arm. The *quan* category comprised three types of weights: *fama* 法馬, *cheng* 秤, and *deng* 戥 (also called *deng* 等 or *dengzi* 等子). The *fama* were bronze weights (*fentong* 分銅) and were used to weigh heavier objects, while the *cheng* and *deng* were both steelyards (*zhuocheng* 棹秤) used for weighing smaller objects, such as medical ingredients or gold and silver.¹⁵

Different types of steelyards were used according to the weight of the object to be weighed. Thus, a large steelyard (*da cheng* 大秤) was used to weigh objects of 100–500 *jin* 斤, a small steelyard was used to weigh objects of 10–50 *jin*, and an even smaller steelyard (*xiao pancheng* 小盤秤) was used to weigh objects of 3–16 *jin*. Meanwhile, for small and precious objects, the *deng* 戥 steelyard was used. The large *deng* 大戥 was used for objects of 50–100 *liang* 兩, while the small *deng* 小戥 was used for objects of 10–30 *liang*.¹⁶ One official *liang* (ounce) of *kuping* (庫平) equated to 37.301 g. However, other *liang* units were used in private transactions, such as the *guanping* 關平, *caoping* 漕平, and *guangping* 廣平, in which 1 *liang*

¹² 中国国家計量總局主編, 中国古代度量衡圖集, 206: ① 戶部鐵方升 (故宮博物館所藏, 1035.469 cm³), ② 上海邑廟 斛中國歷史博物館所藏, 49583.33 cm³).

¹³ Hans Ulrich Vogel, “Aspects of Metrosophy and Metrology during the Han Period,” *Extrême-Orient, Extrême-Occident* 16 (1994): 135–152.

¹⁴ It is difficult to find an English equivalent for *jin* 斤. I have thus followed Endymion Wilkinson’s translation as “catty” in Chapter 42 “Weighing & Measuring” of his *Chinese History: A New Manual* (Cambridge, Massachusetts and London: the Harvard University Asia Center for the Harvard-Yenching Institute, 2012), 551–564.

¹⁵ Miyashita Tadao 宮下忠雄, *Chūgoku heisei no tokushū kenkyū* 中国幣制の特殊研究 [Special study on the Chinese monetary system] (Tokyo: Nihon Gakujutsu Shinkōkai, 1952), 95.

¹⁶ Pak Hūngsu 朴興秀, *Han Chung toryanghyōng chedosa* 韓·中度量衡制度史 [Institutional history of weights and measures in Korea and China] (Seoul: Sungkyunkwan University Press, 1999), 467.

equated to 37.7994075 g, 36.65694 g, and 37.57307 g, respectively.¹⁷

The *fama* 法馬 (also written as 砝碼 or 法碼) were official balance weights. For example, in the case of 100 *liang* worth of *fama*, one set of 28 differing weights could be used to weigh objects ranging from 1 *fen* 分 (or 1/10 of a *qian* 錢) to 100 *liang* 兩 (or 1,000 *qian* 錢) in weight. Normally, two sets of official *fama* were sent to local governments in anticipation of the problem of the used set becoming lighter. When this happened, the backup set was used while the original set was returned to the Board of Taxation to be replaced. To date, four examples of the Qing *fama* have been discovered, one *liang* of which varies from 35 g to 37.4 g.¹⁸

With the establishment of maritime customs in 1858, the standard Qing system of weights and measures became more complicated because of newly added regulations regarding the customs foot rule (*guanchi* 關尺) and customs weights (*guanping* 關平). The separate system of weights and measures was adopted in the treaty ports, where the customs businesses became entrusted to foreigners in the course of concluding commercial treaties such as the Treaty of Tianjin.¹⁹ The next section explores the Qing government's efforts to maintain the standards of its official system of weights and measures.

Management of the Official Weights and Measures

With regard to the regulations for official capacity instruments, the *Da Qing huidian* stipulated the following:

When collecting grain taxes and storing and releasing them to and from granaries, each province ought to use *caohu* 漕斛 (taxation half bushel), and *canghu* 倉斛 (granary half bushel) based on the prototype *tiehu* 鐵斛 (iron half bushel) sent down from the Board of Taxation. The wooden replica (*muhu* 木斛) of the prototype *tiehu* 鐵斛 ought to be reproduced for actual use. [Local governments of] *zhou* 州 (sub-prefectures) and *xian* 縣 (counties) should manufacture annually the required *muhu* 木斛 in the spring season using well-dried timber. In August, the wooden *muhu* should be reported to the grain tax intendant (*liangdao* 糧道) to be inspected and sealed to prevent forgery. The used *muhu* will, after being inspected, receive the inscribed seal with the letters "to be inspected again in such and such year." The *muhu* used at capital granaries (*jingcang* 京倉) and provincial granaries (*tongcang* 通倉) should be manufactured every three years and submitted to the *cangchang* 倉場 to receive the seal. When storing or releasing tax grains back and forth between the granaries, the *muhu* 木斛 used for the day should be secured at night and kept at each ward of granaries. The next day when the *muhu* will be used again, the *cangchang shilang* 倉場侍郎, in the case of provincial granaries, and the *cangchang yushi* 倉場御史, in the case of capital granaries, will be in charge of the

¹⁷ *Ibid.*, 466.

¹⁸ Chūgoku kokka keiryō sōkyoku, ed., 中國國家計量總局主編, footnote 9: ① 伍拾兩銘分銅 (1兩=37.2 g; 1斤=595.8 g, p. 342), ② 「拾兩」分銅 (1兩=36.2 g; 1斤=579.2 g, p. 344), ③ 伍百兩分銅 (1兩=37.4 g; 1斤=598.4 g, p. 376), ④ 故宮博物館所藏 天秤 銅製分銅 (1兩=35.05 g; 1斤=560.8 g, p. 348).

¹⁹ Xi, Yufu 席裕福, ed., *Huangchao zhengdian leizuan* 皇朝政典類纂 [Sources on government institutions of the reigning dynasty] (Taipei: Chengwen Chubanshe, 1962), 卷113, 「市易」法約 第26款: “凡通商各口海關, 均有部頒秤碼丈尺等項, 應照造一分, 比較準確, 送與領事館署收存, 輕重長短, 一與粵海關無異, 每件鑄鐵粵海關字樣, 有鈔餉各銀輪納。中國者俱依此秤碼兌交。如有秤丈貨物爭執, 即以此式為準。”

breaking of the seal and allowing the *muhu* 木斛 to be used for the day and supported by the clerks in supervising the distribution of rice grain. In case any slight error is detected in comparison with the prototype *tiehu* 鐵斛, such an error must be rectified at once by decree.²⁰

The methods for and timing of *hu* 斛 construction were very specific. The *caohu* 漕斛 was used when collecting grain taxes, while the *canghu* 倉斛 was used when storing and releasing revenue grains at the capital and provincial granaries. Both types were copied in wooden form from the prototype iron *tiehu* 鐵斛. The managing officers of the *hu* 斛 differed according to type. The *caohu* 漕斛, which was used for grain tax collecting purposes, was under the control of the grain tax intendants (*liangdao* 糧道) in the *zhou* 州 sub-prefectures and *xian* 縣 counties; these intendants inspected the measure and affixed a seal as a mark of approval. Meanwhile, the *canghu* 倉斛, which was used for the purpose of revenue grain handling, was under the control of the *cangchang yushi* 倉場御史 at capital granaries and the *cangchang shilang* 倉場侍郎 at provincial granaries. Although the regulations regarding the *hu* 斛 appear strict, they had different names and officers in charge, allowing for variation from one region to another.

A succinct summary of Qing government policy toward the system of official measures and weights appears in Wang Qingyun's 王慶雲 (1798–1862) *Shiqu yuji* 石渠餘紀 (Further records from Shiqu):

In 1704, the Kangxi Emperor decreed that the *tiehu* 鐵斛 (iron half bushel), *dou* 斗 (peck), and *sheng* 升 (pint) be constructed and distributed all across the country. Prior to that, it had been observed that the private *hu* 斛 current in each province was not uniform in size, and that the *dou* 斗 and *sheng* 升 had a wider mouth and narrower bottom, creating a host of malicious problems. Therefore, the court officials were ordered to come up with a unified system of capacity measures, and subsequently, they outlined what had been constructed as the standard capacity measures by the Board of Taxation as follows: “In the fifth year of the Shunzhi reign (1648), the Board of Taxation decreased the size of the model *hu* 斛 (*honghu* 紅斛) used at the tribute granaries in the capital because it was a little bit larger than the *tiehu* 鐵斛 used in local districts. In the twelfth year of the Shunzhi reign (1655), a total of twenty exact copies of the prototype *tiehu* 鐵斛 were cast [by the Board] and distributed to its granary in the capital and to every provincial government as well. Recently, seven copies of the prototype *tiehu* 鐵斛 were cast and distributed to Shengjing 盛京 (i.e., Shenyang 瀋陽) and Shuntian 順天 and the five walled cities (Wucheng 五城). Moreover, thirty copies of the flat-bottomed prototype *dou* 斗 and *sheng* 升 were constructed, and distributed to every provincial government to be used as the standard model.” When the Board presented the prototype *hu* 斛, *dou* 斗, and *sheng* 升, the Kangxi Emperor poured water into them to measure the capacity, only to reveal that the corner lines of the *dou* 斗 and *sheng* 升 were not

²⁰ The *Da Qing huidian* cited in this paper is the version from the Jiaqing 嘉慶 era. *Jiaqing Da Qing huidian* 嘉慶大清會典, 卷22: “頒漕斛倉斛, 各省徵收漕糧, 及各倉收放米石。俱由部頒發鐵斛。今如式製造木斛, 較準備用, 州縣每年應需木斛, 春間豫辦版料曬乾, 然後成造。八月送糧道驗烙印, 其毋庸換造者, 亦將舊斛送道較驗, 加烙某年復驗字樣。京通各倉木斛, 三年一製, 呈明倉場烙印。凡收米放米日期, 所用斗斛, 每晚隨廩封儲。次早驗封給發, 通倉由倉場查驗, 京倉由查倉御史查驗, 監放旗員, 一體覈較, 如與鉄斛稍有贏縮, 勅令隨時修整。”

evenly structured and that they held a little less than the prescribed capacity. With regard to the *tiehu* 鐵斛, it was equivalent to 1.6 million *fen* 分; however, it did not come up to the ideal capacity (*jialiang* 嘉量) stipulated in the *Xingli daquan* 性理大全 (Great compendium of human nature and principle) by 20,000 *fen* 分. Still, the conventional *tiehu* 鐵斛 had been in use for a long time, so it was adopted as the first standard to avoid possible confusion. Apart from that, the new second standard instrument (length of 8 *cun* 寸, depth of 5 *cun*, and capacity of 320,000 *fen* 分), and another standard instrument (length of 4 *cun*, depth of 2 *cun*, and capacity of 32,000 *fen*) were constructed and shown to the court official, and it was decreed that “10 *sheng* 升 (pint) make up 1 *dou* 斗 (peck), and 5 *dou* 斗 make up 1 *hu* 斛 (half a bushel) with precision,” and that the respective instrument be cast and distributed. I (Wang Qingyun) think that the equation of the capacity of 1,000 *fen* 分 with the capacity of 1 *cun* 寸 of length and 1 *cun* 寸 of depth originates from this occasion . . . In the ninth year of the Qianlong reign (1744), based on the round *jialiang* 嘉量 from the Later Han, and the rectangular *jialiang* 嘉量 of Zhang Wenshou 張文收 of the Tang, both round and rectangular *jialiang* 嘉量 were newly cast.²¹

In the excerpt above, “the private *hu* 斛 current in each province were not uniform in size . . . creating a host of malicious problems” refers to the Qing government admitting that the lack of uniformity in the private weights and measures was a source of disputes in private transactions, and that it was still difficult to maintain uniformity of the official weights and measures. In an effort to create uniformity in the system of weights and measures, the Qing government identified two goals: first, to construct the standard prototype instruments; second, to distribute them to the offices in charge. The Kangxi era (1662–1772) witnessed a relatively rigorous attempt to unify weights and measures, partly because of the emperor’s personal interest in and mathematical knowledge of measurements.

Two methods were used to fix the standard measures of the prototype instruments. First, the government sought to establish unified measures; for example, by fixing the standard capacity of the *tiehu* 鐵斛 at 1.6 million *fen* 分, as quoted in the excerpt from the *Shiqu yuji*. In doing so, the government used a variety of standards, such as the musical notes of the *huangzhong* 黃鐘—the pitch pipe used to produce a primary musical note in ancient China—and lengths of

²¹ Wang Qingyun 王慶雲, *Shiqu yuji* 石渠餘紀 (Beijing: Beijing Gujue Chubanshe, 1985) 「紀鐵斛鐵尺」: “康熙四十三年, 勅造鐵斗升頒行中外, 先是, 以各省民間用斛大小不一, 升斗面侈底狹, 弊端易生, 諭廷臣集議, 劃一定制, 尋議上, 順治五年, 戶部以供用庫紅斛較通州鐵斗差大, 減改斛式, 於順治十二年, 較準容積, 鑄鐵斛二十具, 發戶部倉場及直省各一。今應照鐵斛鑄造七具, 發盛京順天府五城, 再造底面平準斗升各三十具, 頒直省以爲定式。及戶部呈進樣斛斗升, 仁廟親注水測量, 樣升, 樣斗上下四角不均, 積數見方又奇零不足, 測鐵斛積數得一百六十分, 較之性理大全嘉量, 每斛應積數一百六十二萬分, 爲少二萬分。以鐵斛用之已久, 不可輕改, 乃依以爲準, 別造新樣斗一具, 方徑八寸, 深五寸, 積數得三十二萬分, 新樣升一具, 方徑四寸, 深二寸, 積數得三萬二千分。出以示廷臣, 竝論以依此十升爲斗, 五斗爲斛, 毫釐不差。勅照式鑄造頒行。臣案, 方深一寸積一百分度量之法, 實由此起。 . . . 至乾隆九年, 得東漢嘉量, 又攷唐張文收方形嘉量, 仍其遺制造嘉量方門各一個。” Wang Qingyun 王慶雲 (1798–1862) from Fujian Province was a high-ranking official of the Qing, serving in a series of important posts in provincial governments, and contributed to suppressing rebellions on several occasions. He seems to have become keenly aware of the seriousness of the financial problems while managing the affairs of provincial governments. As a matter of fact, while serving as governor of Shanxi Province, he was credited with the reform of the problem-ridden administration of the salt monopoly. Based on his experiences as a reform-minded official in provincial administration, he wrote the *Shiqu yuji* 石渠餘紀 (Further records from Shiqu), most likely in the 1850s.

shu 黍 (sorghum grain). However, there were no principles according to which certain standards took priority over others, suggesting that the government did not have a clear set of rules governing the fixed procedures for the standard prototype instruments.²² Second, the government resorted to the classical standards, such as those quoted in the *Xingli daquan*, the *jialiang* 嘉量 (ideal capacity of the Later Han), and by the Tang scholars, as stated in the excerpt from the *Shiqu yuji*. These examples of standard measures introduced in the *Shiqu yuji* are traditional standards, indicating that there was little interest in referring to the private weights and measures in contemporary use.

As exemplified in the cases of the *caohu* 漕斛 (taxation half bushel) and *canghu* 倉斛 (granary half bushel) in the *Da Qing huidian*, the Qing used a top-down system of control to govern weighing and measuring instruments: the capital boards constructed the prototype instruments and distributed them to each province, which in turn distributed copies to subordinate *fu* 府 (prefectures) and *xian* 縣 (counties). However, there was no single controlling agency in the central government. Rather, the prototype for the *yingzao chi* 營造尺 (construction foot rule) was under the authority of the Ministry of Works (*gongbu* 工部), which distributed its copies directly to the *buzhengshi* 布政使 (Provincial Tax Administration Commissioner), while the prototype for capacity measure of the *canghu* 倉斛 (granary half bushel) was controlled by the Ministry of Finance (*hubu* 戶部). While the Board of Construction constructed the *tiehu* 鐵斛 (iron half bushel) based on the Board of Taxation's prototype, the Board of Taxation was in charge of distributing it to local agencies. The *tiedou* 鐵斗 (iron peck) and *tiesheng* 鐵升 (iron pint) followed the same procedure. Used measuring instruments had to be returned to the Board of Taxation. As such, while the two boards remained the controlling authority in the center,²³ no consolidated agency exercised control over the country's weights and measures.²⁴

Table 1 illustrates the distribution agencies for the prototype instruments based on the orders issued by the central government. It should be noted that the distributed prototypes did not necessarily cover the complete range of the provincial administration, with coverage more limited than expected. Table 1 also reveals that the central government's order to distribute standard measuring instruments did not necessarily cover the whole empire. Indeed, orders meant for the entire country were only issued in 1655 (to every provincial administration commissioner), 1658 (to every customs official), 1660 (to every governor and governor-general), 1662 (to every province), 1704 (to every province), 1733 (to every provincial administration commissioner), and 1776 (to every province). The remaining thirteen orders were intended for particular localities or agencies. Moreover, the orders were primarily concerned with measuring military provision grain. Therefore, although the Qing government never diminished its focus

²² Wu Chengluo (1937, 294, and 297).

²³ Linji Taiwan Kyukan Chōshakai, ed. 臨時台灣旧慣調査会編. *Shinkoku gyōsei hō* 清国行政法 [Administration law of the Qing]. Tokyo: Taian, 1965–1968, 119.

²⁴ Wu Chengluo (1937, 279).

Table 1. Distribution agencies of prototype instruments by year

Year	Distribution agencies	Year	Distribution agencies
5 th year of Shunzhi (1648)	坐糧廳	8 th year of Qianlong (1743)	京倉, 通倉
12 th year of Shunzhi (1655)	倉場侍郎, 漕運總督, 直省布政司	31 st year of Qianlong (1765)	京倉
15 th year of Shunzhi (1658)	各關	41 st year of Qianlong (1776)	各省
17 th year of Shunzhi (1660)	各督撫	57 th year of Qianlong (1792)	河東
1 st year of Kangxi (1662)	各省	10 th year of Jiaqing (1805)	盛京, 黑龍江 吉林
6 th year of Kangxi (1667)	漕糧	15 th year of Daoquang (1835)	八旗, 工部
43 rd year of Kangxi (1704)	各省, 盛京, 戶部, 順天府	30 th year of Daoquang (1850)	奉天 (2回)
45 th year of Kangxi (1705)	陝西糧米	2 nd year of Tongzhi (1863)	奉天
11 th year of Yongzheng (1733)	各布政司	13 th year of Tongzhi (1874)	奉天 (2回)

Source: *Jiaqing Da Qing huidian shili* 嘉慶大清會典事例, “Hubu ershijiu” 戶部二十九, “Quanliang” 權量.

on unifying the system of weights and measures, this interest did not result in the establishment of a consistent, empire-wide control system of weights and measures. What was carried out was a series of corrective measures to solve the transactional problems that arose, as confirmed in the *Da Qing huidian* and *Shiqu yuji*.

Nevertheless, the Qing government attempted to distribute the standard prototypes of weights and measures throughout the country. This can be considered progress because, as Zhang Zhao 張照 (1691–1745) pointed out in the Kangxi era (1662–1722), “the distribution of such prototypes was unknown during the Yuan and the Ming.”²⁵ In enacting punishments for infractions against the weights and measures regulations, the *Great Qing Code* (*Da Qing lü* 大清律) generally followed the punishments stipulated in the *Great Ming Code* (*Da Ming lü* 大明律).²⁶

Everyone who privately constructs *hu* 斛, *dou* 斗, scales, or foot-rules (*chi* 尺) so that the measures are not correct and uses them in the market, or who takes a government-issued *hu* 斛, *dou* 斗, scales, or foot-rule (*chi* 尺) and makes it false by augmenting or diminishing it, will be sentenced to [being beaten with] sixty strokes with the heavy bamboo. The government artisan [who constructed or altered it] will receive the same [penalty].

If [measures] are issued by the government that are not [constructed] in accordance with the rules, [those who issue or construct them] will receive seventy strokes with the heavy bamboo. If the inspecting official is negligent in his inspection, his penalty will be reduced [from that originally imposed on those who constructed them] by one degree. If he knew about the circumstances, he receives the same penalty.

If, in the market, someone uses measures—*hu* 斛, *dou* 斗, scales, or foot-rules (*chi* 尺)—on which, although they are correct, [the marks on the measures have not been inspected and stamped by the government], they will be sentenced to forty strokes with the light bamboo.

If the officials or clerks in the granary or treasury augment or diminish without authority

²⁵ He Changling 賀長齡, and Wei Yuan 魏源, eds., *Huangchao jingshiwen bian* 皇朝經世文編, 卷56 張照「論樂律及權量疏」: “頒之天下, 奸弊無所措, 元明兩朝無聞焉。”

²⁶ *Da Ming lüli* 大明律例 [Code of the Great Ming], 「戶律」 「市廛」 「私造斛斗秤尺」.

the government-issued *hu* 斛, *dou* 斗, scales, or foot-rule (*chi* 尺) and receive or pay out government property incorrectly, they will be sentenced to one-hundred strokes with the heavy bamboo. Take the item that has been augmented or diminished and calculate the amount of illegally obtained property. If [the punishment for that amount of illegally obtained property] is greater, punish for the illegally obtained property. If he takes and converts it for his own use, the sentence will be based on a supervisor or guardian himself stealing. The artisan will receive eighty strokes with the heavy bamboo. If the supervisor knows and does not report it, he will receive the same penalty as the original offender. If he [simply] fails to discover and investigate, reduce the sentence by three degrees. The punishment is limited to one-hundred strokes with the heavy bamboo.²⁷

Three points should be emphasized. First, privately-constructed weighing and measuring instruments were prohibited in the market place. Second, the governmental approval of weighing and measuring instruments was typically signified by the stamping of a seal on them. Third, the unlawful use of weighing and measuring instruments was typically punished with heavy rather than light bamboo strokes. Evidently, the Qing government was concerned about the uniform management of the weights and measures used in the empire.

However, as the *Jiaqing da Qing huidian shili* 嘉慶大清會典事例 and the *Da Qing lüli* indicate, regulations for the weights and measures were focused on those in official use. Decrees on weights and measures for private use were largely directed at individual localities, making it difficult to find any unifying regulation applied across the empire. Moreover, as will be seen below, the Qing government was less concerned with stipulating and imposing empire-wide uniform standards of weights and measures than effecting their regional uniformity. Therefore, the government appears to have prioritized avoiding disputes over weights and measures. However, the government's limited ability to circulate the uniform standards led to endemic regional disputes over them.

Meanwhile, as the cases of capital granaries (*jingcang* 京倉) and provincial granaries (*tongcang* 通倉) mentioned above and stipulated in the *Da Qing huidian* indicate, the official half bushel (*guanhu* 官斛) had different sizes, which created problems.²⁸ It seems that the lack of a unifying effort on the part of the Qing government was not a matter of ability but insufficient motivation and will. Therefore, by the mid-Qing, the government could not maintain uniformity in its

²⁷ The English translation is quoted with minor modifications from "Article 155. Privately Constructing *hu* 斛, *dou* 斗, Scales, Foot-rule (*chi* 尺)," in *The Great Qing Code*, translated by William C. Jones (Oxford: Oxford University Press, 1994), 166; *Da Qing lüli* 大清律例 (Code of the Great Qing), 卷15. 「戶律」 「市廛」: "凡私造斛斗秤尺不平, 在市行使, 及將官降斛斗秤尺, 作弊增減者杖六十, 工匠同罪。若官降不法者杖七十, 提調官失於校勘者減一等, 知情與同罪。在市行使斛斗秤尺雖平, 而不經官司較勘印烙者, 笞四十。若倉庫官吏, 私自增減官降斛斗秤尺, 收支官物而不平者杖一百, 以所增減物計贓, 重者坐贓論, 因而得物入己者, 以監守自盜論, 工匠杖八十。監臨官, 知而不舉者, 與犯人同罪。失覺察減三等, 罪止杖一百。"

²⁸ National Palace Museum, ed. 國立故宮博物院編輯, *Gongzhongdang Yongzhengchao zouzhe* 宮中檔雍正朝奏摺 [Secret palace memorials of the Yongzheng period] 雍正元年九月初三日 (Taipei: National Palace Museum 國立故宮博物院, 1977–1980), 809: "福建總督高其倬近因撥運盤查, 福建各處米穀, 各屬彼此斗斛不符爭較不已。臣因將福州府倉較準鐵斛之斛, 發較廈門同知倉斛廈門之斛, 即小一升有餘, 則其與各府廳州縣之斛, 自多不準, 又各府廳州縣及各營與司道之法馬, 領放支收, 亦往往各言參差不一。"

official system of weights and measures.²⁹ The following section examines the Qing government's policies and efforts to regulate the extensive array of weights and measures used in the marketplace.

The Qing Government's Management of Privately Used Weights and Measures

The following cases illuminate the central and provincial governments' efforts to maintain uniformity in privately used weights and measures. The Kangxi Emperor's edict was the first of its kind in the Qing government's regulations on this issue:

[Different pecks and half-bushels (*douhu* 斗斛) according to each province] have inconvenienced the populace. The nine chief ministers (*jiuqing* 九卿) and section heads in charge (*zhanshi kedao* 詹事科道) are ordered to discuss this in detail and report how to bring unity to such different pecks and half bushels, and whether or not to stipulate the same size between the mouth and bottom of the peck (*dou* 斗) and pint (*sheng* 升) to prevent harm.³⁰

As a result of the discussion among the grand secretaries (*daxueshi* 大學士) and nine chief ministers, the emperor approved a) the proposal that thirty standard pecks (*dou* 斗) and pints (*sheng* 升) with a uniform size between the mouth and bottom be made and distributed to the concerned agencies; and b) the *jinshi* 金石, *jindou* 金斗, and *guandongdou* 關東斗 used in Shengjing 盛京 be prohibited because they were substantially different from the standard. Also mentioned in the *Shiqu yuji*, this was attempted in the forty-third year of Kangxi's reign (1704) in order to control privately used measuring instruments, with similar efforts having been made later in the Qing period. However, these attempts cannot be considered comprehensive and effective initiatives to unify the privately used weights and measures. The desire to achieve uniformity was accompanied by concerns from within the government that too much intervention would do more harm than good.³¹

The provincial regulations (*shengli* 省例) include some items concerning

²⁹ Wu Chengluo (1937, 279–280).

³⁰ *Jiaqing Da Qing huidian shili* 嘉慶大清會典事例, 卷180 戶部29「權量」: “於民間甚屬未便, 嗣後直省斗斛大小作何劃一, 其升斗式樣底面一律平準, 以杜弊端, . . . 着九卿詹事科道詳議具奏。”

³¹ About thirty years ago, some scholars of Chinese economic history argued that the Qing government intentionally adopted a policy to deter commerce rather than encourage it. However, few scholars would agree with this today. Taking advantage of monopolistic patent (*chishu* 勅書) trade, Nurhaci 奴兒哈赤 (1559–1626), the progenitor of the Qing Dynasty, amassed enormous wealth as a result of acquiring Ming products in exchange for Jurchen furs, ginseng, and pearls. With his growing military power based on newly acquired economic wealth, Nurhaci could subjugate rival Jurchen chiefs, thus paving the way to challenge the Ming Dynasty. Such experience in commercial enterprises among their ancestors encouraged subsequent Qing rulers to take a pragmatic approach to commerce and trade, acknowledging their benefits to the government. However, as has been illustrated in this paper, rather than actively intervening in the commercial order of the private sector, the Qing government tended to adopt an indirect policy that by and large entrusted merchant organizations with dealing with the problems of money and weights and measures as well as internal disputes in the marketplace. For the general attitude of the Qing government toward commercialization, see William T. Rowe, *China's Last Empire: The Qing* (Cambridge, Mass.: Belknap Press of Harvard University Press, 2009), 132–133.

privately used weights and measures. For example, in the *Hulu shichen* 戶律市塵 of the *Hunan shengli chengan* 湖南省例成案 (Precedents and regulations of Hunan Province), dated to 1738, the third year of the Qianlong reign,³² a county magistrate (*zhixian* 知縣) from Xiangtan County 湘潭縣 reported:

In Xiangtan, there are two types of merchants—settled merchants (*zuohang* 坐行) and itinerant merchants (*daihang* 帶行). Villagers sell their grain to settled merchants while visiting merchants buy grain from itinerant merchants. Both types of merchants cheat their customers, as settled merchants use smaller *dou* 斗 and *sheng* 升, while itinerant merchants use lighter *fama* 法馬, thereby causing disarray in the weights and measures. Previously, the former governor (*xunfu* 巡撫) made efforts to unify the weights and measures, but to no avail. Since ad hoc inspections by district or county authorities have not produced a consistent effect, it is recommended that all merchants be ordered to make measuring instruments modeled after those originally distributed, and send them to the provincial authorities for inspection and seals.

The *Buzhengsi* 布政司 (the Provincial Tax Administration Commissioner Office) replied:

Previously, the *Buzhengsi* kept the weighing and measuring instruments distributed by the *Hubu* 戶部 to check those instruments made and sent by each district and county and to obtain approval from the provincial authorities. Those instruments to be used by the merchant houses in market towns were also sent to the district and county authorities for inspection. When tens or hundreds of merchants from every county flock to the provincial capital to have their instruments inspected, the provincial authorities cannot handle them all, and the merchants themselves have trouble traveling back and forth. Therefore, it is advisable that the responsibility for inspecting the weighing and measuring instruments return to the district and county authorities.

The suggestion to place the inspection and control of the weighing and measuring instruments under the purview of district and county authorities was approved by the governor. These debates demonstrate how efforts to unify weights and measures at the level of the local government could become relaxed over time. Other provincial regulations suggest a *laissez-faire* attitude in response to the prevailing diversification of privately used weights and measures, revealing the daunting nature of the task of unification.

In this respect, it is worth examining the control measures at the level of county government, particularly insofar as the announcements by the local governments provide information about the standard units of weights and

³² *Hunan shengli chengan* 湖南省例成案. [Precedents and regulations of Hunan Province], 卷34, 「戶律市塵」: “牙行斛斗秤尺, 牙行斛斗秤尺法碼, 州縣確驗烙發, 并申禁乾魚棉花二行多索用錢, “湘潭縣... 歷分坐帶兩行, 鄉民裝戴穀米, 則投坐行糶壳, 商客販運穀米, 則赴帶行購買. 然行之名雖殊. 其所用斛斗法碼原無二制. 理宜較定劃一... 該坐行, 則勾引充客, 或將斛斗改小, 而帶行則勾引買商, 或將法碼改輕, 業奉前院憲藩, 較準斛平, 頒法遵行. 是以商民, 永無爭競, 迄今歷年久遠, ... 揆闕由來, 皆因原頒斛斗法碼, 年久不無更易, 以致彼此訐訟. 若卑職, 查較恐立不能經久無弊. 合無仰懇憲臺俯賜, 飭令各行戶, 仍照原頒之行, 斛糧平劃一, 製造齊赴憲, 較查驗印烙發給.”

measures, as well as how they were managed and controlled. Consider the following case from the Jiangnan area:

In the fifty-eighth year of Kangxi's reign (1719), Zhang Yinxiang 張寅詳, the magistrate of Jiading County 嘉定縣, under orders from *Buzhengshi* 布政使 Yang 楊, erected an epitaph at the city shrine (*chenghuang miao* 城隍廟) of Nanxiang City, which read: "In weighing, one jin 斤 (catty) ought to consist of sixteen *liang* 兩 (ounces); and the steelyard *deng* 戥 ought to use thirteen-marked *fama* 法馬 currently in the market as standard. Arbitrary practices in the past, such as applying three kinds of counterpoise (*chui* 錘) to make [the object] weigh more or less, and manipulating the balance weights, should be stopped altogether."³³

As such, rather than an officially made and disseminated weight, the county employed a privately used, representative *fama* as a standard. The "thirteen-marked *fama*" (十三號 法馬) was frequently used in the land transaction documents of the Suzhou 蘇州 neighborhood, and were referred to as "mountain-entering-marked *fama*" (入山號 法馬) to distinguish them from official *fama*. Moreover, the control of weights and measures at the county level generally targeted individual trades or professions rather than a given region as a whole. For example, one epitaph inscription titled, "Jiading xian wei jiaozhun diancheng gaoshi bei" 嘉定縣為較准砵秤告示碑, announced "standardization of steelyards specialized for indigo-dye in Jiading County."

In terms of how effectively these government regulations worked in the real world, a Meiji-era study on Qing commercial customs and finance provides a decisively negative answer.³⁴ According to the study, the Qing government's inspection and control of privately manufactured and used weighing and measuring instruments was practically non-existent. Government control and regulations were largely limited to the officially manufactured and used instruments, leaving the relatively chaotic state of privately used ones unchecked.³⁵ Although some regulations were in place, the government lacked the will to enforce them.³⁶

While prioritizing the control of official weights and measures, the Qing government was unable to implement unified methods of control for both officially and privately used weights and measures. While the government made numerous efforts to define the standards for the weights and measures for official use, it seemed content with bringing only a measure of unity to private weights and measures with given regions. Consequently, although the *Great Qing Code* clearly

³³ Shanghai Bowuguan Tushuziliaoshi bian 上海博物館圖書資料室編, *Shanghai beike ziliao xuanji* 上海碑刻資料選輯 [Collection of inscription materials from Shanghai] (Shanghai: Shanghai Renmin Chubanshe, 1980), 128: "嘉定縣為較准砵秤告示碑" "康熙五十八年, 知縣張寅詳奉布政使楊批示, 立石南翔城隍行祠內, 略曰, 「秤以十六兩為乙斤, 戥以民間通用十三號法馬為准, 從前一秤三錘, 任意輕重, 手法高低等弊, 盡行革除。」"

³⁴ The Tung Wen College 東亞同文書院, *Shinkoku shōgyō kanshū oyobi kin'yō jijō* 清國商業慣習及金融事情 [The Qing commercial customs and finance] (1904), 140.

³⁵ Wu Chengluo (1937, 279–281, and 298); *Shinkoku gyōsei hō* 清國行政法, 卷三, 107; 村松祐次, 中國經濟の社会態制 (東洋經濟新報社, 1975), 145–147.

³⁶ Wu Chengluo (1937, 273).

stipulates penalties for using non-acceptable weights and measures, the government maintained a *laissez-faire* attitude toward them in the market place.³⁷

The contrasting pictures of the Qing weighing and measuring system depicted in both the *Great Qing Code* and the *Shinkoku shōgyō kanshū oyobi kin'yū jijō* illustrate the coexistence of official regulations (formal constraints) by the Qing government and private practices (informal constraints) in the marketplace, with the application of the former being far from universal. The next section explores the actual operation of the weighing and measuring system in private areas under conditions where the government's regulations fell short of total enforcement.

Actual Conditions of the Private Weights and Measures in Use

While the preceding section highlights the discrepancy between the state regulations and private use of weights and measures, this section illustrates the degree of this discrepancy. In his study on the rice prices of the Guangdong region, Chen Chunsheng 陳春聲 makes an intriguing comment: "Although the Guangdong region lacked uniformity in weights and measures, since the merchants were well acquainted with their local conditions, they faced little difficulty in making conversions between them."³⁸ In order to clarify this observation further, this section examines the differences between and within regions.

Variations from One Region to Another

Nationwide statistics on weights and measures are only available from the late Qing, with no such surveys of weights and measures conducted prior to the nineteenth century. However, sporadic statistics on grain measuring containers and silver weighing balances appear in provincial officials' reports (*zouzhe* 奏摺) from the mid-Qing period. Provincial officials reported information regarding the privately used containers for measuring grain in comparison to official standard measures. Table 2 presents the differences in volume between official and private measures by region.

Although the examined areas are too limited to reflect nationwide conditions, the data demonstrate an unmistakable trend of difference between officially-used *hu* 斛 and their privately used counterparts. The largest discrepancy, from Yunnan 雲南 (3.0), was 3.75 times bigger than the smallest one, *honghu* 洪斛 (0.8), if *Guandonghu* 關東斛 (0.5) is excluded. Moreover, as the differing ratios (1.5 and 1.6) within Guizhou 貴州 suggest, there were variations within the same region. Table 2 also reveals that rice-exporting regions tended to use relatively larger *hu* 斛.

³⁷ Arai Seiji 荒井政治, "Igirisu ni okeru ichi no hattatsu ni tsuite" イギリスにおける市の發達について [On the development of cities in England]. *Shakai keizai shigaku* 社会経済史学 25, no. 1 (1959): 68–69.

³⁸ Chen Chunsheng 陳春聲, *Shichang jizhi yu shehui bianqian—18 shiji Guangdong mijia fenxi* 市場機制與社會變遷—18世紀廣東米價分析 [Market systems and social changes: Analysis of Guangdong rice prices in the eighteenth century] (Guangzhou: Zhongshan Daxue Chubanshe, 1992), 265.

Table 2. Ratio of local private *hu* 斛 to official standard *hu*³⁹

Localities	Ratio to the standard	Localities	Ratio to the standard
1. 貴州府城	1.5	7. 貴州府城	1.6
2. 重慶府城	2	8. 宜昌府城	2.4
3. 長沙府城	1.1	9. 洪斛	0.9
4. 貴州府城	1.5	10. 洪斛	0.8
5. 重慶府城	2.3	11. 關東斛	0.5
6. 雲南府城	3.0		

In his trade guidebook, *Shanggu bianlan* 商賈便覽 (Manual for merchants), “Pingcheng shipu” 平秤市譜, published in 1792 (the seventeenth year of the Qianlong era), Wu Zhongfu 吳中孚 (fl. 1769–1792) described weight units for silver as follows:

Currently, only the *kuping* 庫平 have uniform weight value across the nation, and are also called *sima pingwei* 司馬平惟. Previously, the *lao guangmaping* 老廣碼平 from Guangdong was almost equal to the *kuping*, but the recent *xin guangma* 新廣碼 lacks several *fen* 分 per one hundred *liang* 兩 (tael) [in comparison with the *kuping*]. Previously, the *lao caofa* 老曹砵 of Suzhou 蘇州 lacked 2 *liang* 兩 and 5 *qian* 錢 per every several hundred *liang*, compared with the *kuping*. The recent *xin caofa* 新曹砵 varies in size and weight; nonetheless, many towns are using *caofa* 曹砵 in their transactions and exchanges. Currently, both capitals, every provincial capital, and prominent market towns are employing both the *kuping* and the *caoping* as standard weights [in weighing silver]. Although individual market towns have their own weights of differing sizes, it is still possible to conduct transactions between them by calculating the size out of weight according to the *kuping* and the *caoping* standards.⁴⁰

The excerpt above indicates how commercial transactions were possible across cities and provinces in the midst of a bewildering variety of weights and measures. Indeed, the *kuping* remained in nationwide use as the official unit for weighing silver, while the *caoping* paralleled it as the private weight in marketplaces, especially the nation’s major commercial centers.⁴¹ However, the *caofa* 曹砵, including the *xin caofa* 新曹砵, was not uniform throughout the nation, resulting in sizes differing from one region to another. The same guide, *Shanggu bianlan* 商賈便覽 (*juan san* 卷三, “Gexing maimai damatou” 各省買賣大馬頭), provides the names and sizes of the silver weights used in major commercial centers (Table 3).

³⁹ ① 宮中檔康熙朝奏摺, 康熙52年1月13日, ② 宮中檔雍正朝奏摺, 5–726 四川, ③ 宮中檔雍正朝奏摺, 雍正元年9月6日, ④ 宮中檔雍正朝奏摺, 同4年4月29日, ⑤ 宮中檔雍正朝奏摺, 同5年7月11日, ⑥ 周於礼「條陳征緬事宜疏」, 皇朝經世文編, 卷87, ⑦ 宮中檔雍正朝奏摺, 7年11月7日 ⑧ 宮中檔乾隆朝奏摺, 17年4月25日 ⑨ 皇朝政典類纂, 卷113「市易」⑩ 皇朝政典類纂, 卷113「市易」⑪ 皇朝政典類纂, 卷113「市易」.

⁴⁰ *Shanggu bianlan* 商賈便覽, 卷之五「平秤市譜」: “天下惟庫平劃一, 又名司馬平. 從前廣東老廣碼平與考評相倣, 近來新廣碼, 每百兩有小數錢不一. 而各鎮蘇州老曹砵比庫平, 每百少二兩五錢. 近來新曹砵, 有多少小錢數不一. 而各鎮買壳兌換, 市用曹砵似處多, 所以兩京各省各鎮以庫曹二平宗之爲譜. 雖各處市鎮各有別議行規規之平, 太所者多, 然當以庫曹二平爲譜, 較之大小, 會算而定交易可也.”

⁴¹ Miyashita (1952, 106).

Table 3. Names and weights of balances used in major commercial centers

Centers	Name of the balance	Ratio to the <i>kuping</i> (庫平)	Ratio to the <i>caoping</i> (漕平)
Nanjing (南京)	Qianping (錢平)	0.990	1.015
Nanjing (南京)	Muping (木平)	0.980	1.005
Nanjing (南京)	Liangshiping (糧食平)	0.951	0.975
Suzhou (蘇州)		0.975	1.000
Jiangxidatongzhen (江西大通鎮)	Doumaiping (荳麥平)	0.897	0.92
Jiangxiwuzhen (江西吳鎮)		0.96	0.984
Jiangxijingdezhen (江西景德鎮)		0.937	0.96
Jiangxijingdezhen (江西景德鎮)		0.917	0.94
Jiangxizhangshuji (江西樟樹集)		0.985	1.01
Jiangxizhangshuji (江西樟樹集)		0.970	0.994
Jiangxishengcheng (江西省城)		0.980	1.005
Ganzhoufu (贛州府)		0.990	1.015
Hangzhou (杭州)	Qianping (錢平)	0.942	0.966
Ningbo (寧波)		0.985	1.01
Shaoxing (紹興)		0.980	1.005
Fujianhengcheng (福建省城)	Qianping (錢平)	0.980	1.005
Fujianhengcheng (福建省城)	Zahuoping (雜貨平)	0.965	0.99
Hankouzhen (漢口鎮)	Qianping (錢平)	0.956	0.98
Sichuanshengcheng (四川省城)		1.000	1.026

Table 3 reveals that the units for weighing silver varied by region, although the differences between them were significantly smaller than those in the capacity measures for grain. In general, the regional weights were smaller than the *kuping*, with the exception of Sichuan Province, while the *caoping* of Suzhou stood at the median in regional variation.

However, the small difference in weights for weighing silver is not comparable to the small difference in weight units for weighing large volume goods apart from gold, silver, and medical materials. With the possible exception of grain, contemporary goods in large volumes were generally measured by weight using *jin* 斤 and *dan* 擔 (100 *jin*). Writing in the Kangxi era, Hu Zhao 胡煦 (1655–1736) claimed that the “*dengcheng* 戥秤 of each province varies depending on employing *sufa* 蘇法 (*fama* of Suzhou) or *guangfa* 廣法 (*fama* of Guangdong). In using the balance, one *jin* is represented as 14 *liang*, 16 *liang*, 18 *liang*, and even 24 *liang*, because there had been no uniform weighing units.”⁴² Essentially, the different weights resulted in the *liang* value of one *jin* unit differing from one region to another.

Table 4 lists the regional ratio of *sheng* 升 to *shisheng* 市升 according to size, revealing that the smallest (0.476) was from Hexian 賀縣 (Guangxi), the largest (8.400) was from Lanzhou 蘭州 (Gansu), and the difference between them was

⁴² Xi Yufu 席裕福, ed., *Huangchao zhengdian leizuan* 皇朝政典類纂 (卷一百三), 「市易」一「權量」 「付錄」 胡煦 「請釐定制度疏」: “各省原不一戥秤蘇法, 廣法之不同. 其秤亦有十四兩, 十六兩, 十八兩, 二十兩之不同. 是輕重之, 在各省原不一具衡也.”

a ratio of 17.6. While the regional variation in the size of the capacity measuring instruments is indisputable, there is a correlation between the size of the capacity measuring instruments and regional economic development. In this respect, with the exception of Guangzhou 廣州 (4.865), the regions using smaller capacity units—including Xiamen 廈門 (0.890), Suzhou 蘇州 (1.006), Hangzhou 杭州 (1.053), and Shanghai 上海 (1.075)—tended to be more economically advanced. In contrast, the regions using larger capacity units—such as Qiqihaer 齊齊哈爾 (Heilongjiang, 4.221), Chifeng 赤峯 (Hebei, 5.065), Weichang 圍場 (Hebei, 6.106), Rongcheng 榮城 (Shandong, 8.000), and Lanzhou 蘭州 (Gansu, 8.400)—were typically less economically developed.

Table 4. Regional variations of capacity measures (per *sheng*) in the Republican era

Region	Name or use	unit	Conversion to <i>shisheng</i> (市升)
Hexian (Guangxi) 賀縣 (廣西)	Jiutongyongsheng (舊通用升)	per <i>sheng</i>	0.476
Jinan (濟南)	Jiuliangxingshang (舊糧行商)	per <i>sheng</i>	0.547
Qidong (Jiangsu) 啓東 (江蘇)	Jiutongyongsheng (舊通用升)	per <i>sheng</i>	0.741
Xiamen (廈門)	Jiuyuanzhuidou (舊鬥錐斗)	per <i>sheng</i>	0.890
Fuzhou (福州)	Jiumisheng (舊米升)	per <i>sheng</i>	0.919
Nanchang (南昌)	Jiumisheng (舊米升)	per <i>sheng</i>	0.920
Suzhou (蘇州)	Jiutongyongshu (舊通用斛)	per <i>sheng</i>	1.006
Hankou (漢口)	Jiugonghu (舊公斛)	per <i>sheng</i>	1.030
Hangzhou (杭州)	Jiuhangsheng (舊杭升)	per <i>sheng</i>	1.053
Anqing (安慶)	Jiumisheng (舊米升)	per <i>sheng</i>	1.056
Shanghai (上海)	Jiumiaohu (舊廟斛)	per <i>sheng</i>	1.075
Xiamen (廈門)	Jiuguxingdou (舊鼓形斗)	per <i>sheng</i>	1.077
Zhangjiakou (張家口)	Jiujitongdou (舊九筒斗)	per <i>sheng</i>	1.110
Beiping (北平)	Jiuxishidou (舊西市斗)	per <i>sheng</i>	1.197
Beiping (北平)	Jiuliangmaihu (舊糧麥斛)	per <i>sheng</i>	1.198
Hankou (漢口)	Jiufanhu (舊樊斛)	per <i>sheng</i>	1.422
Kaifeng (開封)	Jiutongyongshu (舊通用斛)	per <i>sheng</i>	1.450
Xian (西安)	Jiumisheng (舊米升)	per <i>sheng</i>	1.630
Dagu (Shanxi) 大谷 (山西)	Jiuguandou (舊官斗)	per <i>sheng</i>	2.029
Fanyang (瀋陽)	Jiufandou (舊藩斗)	per <i>sheng</i>	2.257
Taiyuan (太原)	Jiuguandou (舊官斗)	per <i>sheng</i>	2.382
Changchun (長春)	Jiutongyongshu (舊通用斛)	per <i>sheng</i>	2.421
Suiyuan (綏遠)	Jiuguandou (舊官斗)	per <i>sheng</i>	2.535
Yantai (煙台)	Jiujindou (舊鎰斗)	per <i>sheng</i>	2.826
Changchun (長春)	Jiutongyongshu (舊通用斛)	per <i>sheng</i>	2.961
Chengdu (成都)	Jiutongyongsheng (舊通用升)	per <i>sheng</i>	3.200
Qiqihaer (齊齊哈爾)	Jiutongyongsheng (舊通用升)	per <i>sheng</i>	4.221
Guangzhou (廣州)	Jiumidou (舊米斗)	per <i>sheng</i>	4.865
Chifeng (赤峯)	Jiutongyongdou (舊通用斗)	per <i>sheng</i>	5.065
Weichang (圍場)	Jiutongyongdou (舊通用斗)	per <i>sheng</i>	6.106
Rongcheng (Shandong) 榮城 (山東)	Jiuxiangsheng (舊廂升)	per <i>sheng</i>	8.000
Lanzhou (蘭州)	Jiushisheng (舊市升)	per <i>sheng</i>	8.400

Variations within Region

While local gazetteers were silent on the topic of weights and measures in large cities such as Suzhou and Shanghai, local gazetteers of market towns provide some details. Nonetheless, detailed records on the weights and measures found in local gazetteers are rare, with the possible exception of *Jiaqing Zhuli xiaozhi* 嘉慶 珠里小志 (*juan san* 卷三), “Fengsu” 風俗.⁴³

The *Zhuli xiaozhi* was the local gazetteer of Zhujiājiao 朱家角鎮, a market town in Qingpu *xian* 青浦縣, Songjiang *fu* 松江府. It was published by a local elite named Zhou Yubin 周郁賓 in the twentieth year of the Jiaqing era (1815). Located in the western suburb of modern Shanghai, near Suzhou *fu* 蘇州府, Zhujiājiao was a market center in the flourishing Yangzi delta. It was referred to as the “producer of rice and fish,” and the town, where “merchants gathered like clouds,” was known for its thriving trade in cotton and cotton products. The “Household and Population” (戶口) section of the gazetteer recorded 1,500 households and a population of 6,000.⁴⁴

With regard to the *chi*, *suchi* 蘇尺 and *muchi* 木尺 were cited in comparison to the *guanchi* 官尺 (official foot), as illustrated in Table 5. It should be noted that the difference between the former and the *guanchi* 官尺 was as much as six inches.

Table 5. Variations of capacity measures in terms of *chi* (尺)

Name	Length	Name	Length
<i>Guanchi</i> (官尺)	10 <i>cun</i> (寸)	<i>muchi</i> (木尺)	6 <i>cun</i> (寸)
<i>Suchi</i> (蘇尺)	9 <i>cun</i> (寸) 7 <i>fen</i> (分)		

In regard to capacity units such as the *hu* 斛, the gazetteer makes it clear that the town of Zhujiājiao used what they called *qiaohu* 橋斛 as the “standard measure” in grain transactions, and that in terms of capacity size, *qiaohu* 橋斛 could contain “5 *dou* 斗 and 6 *sheng* 升.” This indicates that a certain standard unit for capacity measuring existed in the town. The subunits of *qiaohu* 橋斛 contained *yinghudou* 應斛斗 (5 *yinghudou* = 1 *hu* of *qiaohu*) and *gongsheng* 公升 (10 *gongsheng* = 1 *yinghudou*). Apart from the *qiaohu* 橋斛 affiliates, there were other kinds of *hu* 斛,

⁴³ Zhou Yubin 周郁濱. *Zhulixiaozhi* 珠里小志 [Little gazetteer of Zhujiājiao township], 卷三「風俗」(中國地方志集成鄉鎮志專輯 2, 上海古籍出版社, 1992), 510–511: “市中量物曰斛 (按農田余語, 今之官斛, 起于賈似道) 曰斗曰升 (升斗古今不同, 顧寧人謂三代以來升斗, 至隋而大變)。古以十斗爲斛, 今以十斗爲石, 五斗爲斛 (按葦航記讀, 宋韓彥古爲戶部尚書, 孝宗問曰, 十石米有多少。對曰萬合千升, 百斗廿斛。然則五斗爲斛, 宋時已然)。珠里用橋斛 (容五斗六升, 四鄉之斛有五斗四升至五斗七升八升者已, 市中糶糴皆以橋斛爲準)。橋斛有四 (東市西市中市北市), 昔皆劃準, 今東西市二市斛稍大。又有刻字斛 (容五斗八升), 十升爲一斗, 市有應斛斗 (五斗應橋斛一斛), 准斗 (容糶升十升), 豐斗 (容五升謂之五升斗)。十合爲升, 市中公升 (五十升應橋斛一斛), 烏鎮升 (六十升應橋斛一斛), 糶升 (米鋪所用, 七十升或七十五升應橋斛一斛)。稱物曰稱 天平稱 (十六升爲斤), 雙稱 (三十二兩爲斤, 地貨用之), 行掛稱 (十九兩五錢爲斤, 亦地貨用之), 會同稱 (二十二兩爲斤, 昔年肉莊所用), 公稱 (十七兩六錢爲斤, 今肉莊所用), 角稱 (廿一兩六錢爲斤), 店掛稱 (十五兩三錢爲稱斤), 盤稱 (十四兩八錢爲斤), 酒稱 (十二兩爲斤), 桐油稱 (即砵子稱, 十五兩三錢爲斤)。度物曰尺官尺 (十寸), 蘇尺 (九寸七分), 木尺 (六寸)”

⁴⁴ Mori Masao, 森正夫, “Shukakakuchin ryakushi” 朱家角鎮略史 [Brief history of the Zhujiājiao town] in Mori Masao, ed., *Kōnan deruta shichin kenkyū* 江南デルタ市鎮研究 [Study of the Jiangnan delta market towns] 57–128 (Nagoya: Nagoya Daigaku Shuppankai, 1992).

dou 斗, and *sheng* 升, such as *kezihu* 刻字斛, *zhundou* 准斗, *fengdou* 豐斗, *wuzhensheng* 烏鎮升, and *tiaosheng* 糶升. For example, as the smaller *tiaosheng* 糶升 was affiliated to the *zhundou* 准斗 category rather than the *yinghudou* 應斛斗, 10 *tiaosheng* 糶升 equaled 1 *zhundou* 准斗. However, the gazetteer provides the relative sizes of these extra measuring units vis à vis the *qiaohu* 橋斛 equivalents, and their capacity values can be expressed in terms of the *dou* 斗, as illustrated in Table 6.

Table 6. Variations of capacity measures in terms of *dou* (斗)

Name	Capacity in <i>dou</i>	Name	Capacity in <i>dou</i>	Name	Capacity in <i>dou</i>
<i>Qiaohu</i> (橋斛)	5.6 <i>dou</i>	<i>Yinghu-dou</i> (應斛斗)	1.12 <i>dou</i>	<i>Gongsheng</i> (公升)	0.11 <i>dou</i>
<i>Kezihu</i> (刻字斛)	5.8 <i>dou</i>	<i>Fengdou</i> (豐斗)	0.5 <i>dou</i>	<i>Wuzhen-sheng</i> (烏鎮升)	0.093 <i>dou</i>
		<i>Zhundou</i> (准斗)	0.75–0.8 <i>dou</i>	<i>Chansheng</i> (糶升)	0.075–0.08 <i>dou</i>

In *Zhujiajiao*, *qiaohu* 橋斛, as the standard capacity measure, was used to understand the differences in size of other measuring containers. Moreover, *hu* 斛 did not represent the same size over the course of time. Accordingly, the gazetteer observed that while *qiaohu* 橋斛 had been “uniform” in size in the past, a slightly larger *qiaohu* was being used in the town’s east and west markets. The surrounding farming areas also tended to use a larger *qiaohu*, which could contain between 5 *dou* 4 *sheng* and 5 *dou* 8 *sheng*.

Table 7 illustrates that the weight value of one *jin* 斤 computed in uniform *liang* 兩 for each *cheng* 秤 (steelyard) varied substantially: the smallest was 12 *liang* for *jiucheng* 酒秤 (steelyard for wine) and the largest, which was 2.6 times greater, was 32 *liang* for *shuangcheng* 雙秤. The variation in the unit weight value among the steelyards had much to do with the goods weighed. Interestingly, two types of steelyard (*huitongcheng* 會同秤 and *gongping* 公平) were used to weigh meat, calculated at 22 *liang* and 17 *liang* for one *jin*, respectively. Unfortunately, the *Zhuli xiaozhi* only indicates “old” (昔) and “current” (今) measures without specifying the dates of their usage. Nonetheless, the gazetteer reveals the changes in the weighing instruments.

Table 7. Differing values of one unit (one catty or *jin* 斤) for weighing balances/steelyards

Name	Weight per <i>jin</i>	Use	Name	Weight per <i>jin</i>
<i>tianpingcheng</i> (天平秤)	16 <i>liang</i> (兩)		<i>jiaocheng</i> (角秤)	22 <i>liang</i> (兩)
<i>shuangcheng</i> (雙秤)	32 <i>liang</i> (兩)	Goods	<i>dianguacheng</i> (店掛秤)	15.3 <i>liang</i> (兩)
<i>hangguacheng</i> (行掛秤)	19 <i>liang</i> (兩)	Goods	<i>pancheng</i> (盤秤)	14.8 <i>liang</i> (兩)
<i>huitongcheng</i> (會同秤)	22 <i>liang</i> (兩)	Meat	<i>jiucheng</i> (酒秤)	12 <i>liang</i> (兩)
<i>gongping</i> (公平)	17 <i>liang</i> (兩)	Meat	<i>tongyoucheng</i> (桐油秤)	15.3 <i>liang</i> (兩)

The weight value of the *liang* 兩 unit was not uniform in the Jiangnan area. For example, within the Suzhou *fu* (sub-prefecture) the balances for weighing silver varied from one place to the next, as reflected in land contracts, which stipulated the specific balance for weighing the silver paid to buy land. A series

of land contracts contained in the *Qianlong jian Suzhou Yuanhe xian Bixianguan zhichan jilu* 乾隆間蘇州元和縣碧仙館置產記錄⁴⁵ list a variety of balances, such as *Chenduansheng* 陳端生, *fama Zhouzhuang ping* 法馬周莊平, *fama caoping* 法馬曹平, and *fama Chenduansheng caoping* 法馬陳端生曹平,⁴⁶ which had differing weight values for one silver *liang*. Although there was no single standard balance for weighing silver, one balance, the *Chenduansheng* 陳端生 (named after the money exchanger Chen Duansheng 陳端生)⁴⁷ was used more frequently (Hamashita 1983) than the others.⁴⁸

As noted, within a given district, a variety of weighing and measuring instruments with differing unit values and target objects were used. The weights and measures used during the Qing period were very different from the unified system with definite unit values used today. The official standard weights and measures stipulated by the Qing government had a remarkably limited application in private transactions in marketplaces, creating “an asymmetry in available information”⁴⁹ regarding the official standards between the state and the market. With the limited applicability of the “formal constraints” of the official rules for the country’s weights and measures, market transactions were largely conducted under the “informal constraints” of market conventions. The next section discusses how Qing officials and intellectuals addressed these discrepancies between the state and market in defining and using the country’s weights and measures.

Perceptions of the Problems of Qing Weights and Measures among the Elite

This section examines Qing policy reform proponents’ perceptions of the problems of Qing weights and measures and the corrective measures they suggested. More specifically, this section discusses the policy proposals advanced by the central government, local government, and local literati circles.

The case of Zhang Zhao 張照 (1691–1745), a former minister of the Board of Punishments from Songjiang Prefecture 松江縣, illustrates the debates and policy proposals developed at the central government level. Zhang Zhao blamed the lapse in enforcing the official standards of weights and measures as the reason for their eventual disarray in his memorial of 1741 (the sixth year of the Qianlong reign):

The current problems lie not in the lack of regulations but in the failure to keep them. I propose that the official models of *chi* 尺 (foot), *heng* 秤 (balance or scale), *fama* 法馬 (official balance weights), and *dou* 斗 (peck) and *hu* 斛 (half bushel) are constructed on

⁴⁵ Hong Huanchun 洪煥椿, *Ming Qing Suzhou nongcun jingji ziliao* 明清蘇州農村經濟資料 [Materials on the rural economy of Suzhou in the Ming and Qing] (Nanjing: Jiangsu Gujie Chubanshe, 1981), 144–168.

⁴⁶ *Ibid.*, 271–275.

⁴⁷ Hamashita Takeshi 浜下武志, ed., *中国土地文書目錄・解説 Chūgoku tochimonjo mokuroku gaisetsu* [Catalogue and explanation of land documents of China] (Tokyo: Tōkyō Daigaku Tōyōbunka Kenkyūjo Tōyōgaku Bunken Sentā 東京大学 東洋文化研究所附属 東洋学文献センター, 1983), 69.

⁴⁸ *Ibid.*, 8.

⁴⁹ George A. Akerlof, “The Market for Lemons: Quality Uncertainty and the Market Mechanism,” *Quarterly Journal of Economics* 84, no. 3 (1970).

the basis of the table [included in the *Da Qing Huidian*], and distributed throughout the country. I further propose that the table of weights and measures included in the *Da Qing Huidian* be carved out on printing blocks, and copies distributed to all the provinces with a clear prescription against its breach, so that all the people may well know and follow the standards. This measure will certainly bring unity to the system of weights and measures. It is true that current customs vary from region to region, and what is taken as convenient is different according to local customs. Nevertheless, if we [central] officials hold on to a set of regulations, and straighten out the local differences with central uniformity, consistent practices will be ushered in without damaging local transactions. This is what I heard earlier from the Kangxi Emperor. . . . If the [central] government, however, deviates from its own standards of weights and measures in pursuit of profits, then the people are bound to think that the state does not maintain a fixed set of standards in the first place and will attempt to establish their own practices. With the passage of time, the [central] government has found it convenient to tolerate what has been practiced in private transactions. This has been the fundamental reason for the failure to achieve uniformity in weights and measures generation after generation.⁵⁰

The gist of Zhang Zhao's proposal was that the unification of weights and measures would be an achievable objective if the proactive central government established a set of regulations and enforced them rigorously. Continuing this line of argument, Zhang Zhao reminded his audience of the Kangxi Emperor's policy on weights and measures. It was under his auspices that the unification of the Qing weights and measures across the country had been undertaken. The following decree of 1704 (the forty-third year of his reign) reveals what he believed to be the principal cause for the problematic variations in the empire's weights and measures:

In our view, the weighing balances currently used in markets in each province vary in their weight values, yet their differences are not that substantial. The capacity size of *dou* 斗 (peck) and *hu* 斛 (half bushel) differ greatly from each other—not only those used in each province but also even those used in cities and villages within each county. The status [of *dou* and *hu*] has come to this because intermediaries (*yakuai* 牙儂) and appraisers (*pingjiaren* 評價人) engage in profiteering.⁵¹

It is unclear what sources the Kangxi Emperor used to conclude that the variations in weight measuring instruments were more problematic than those of capacity measuring instruments such as *dou* 斗 and *hu* 斛. Nonetheless, he echoed many reform officials of the Qing government, who attributed the disarray in the

⁵⁰ He Changling 賀長齡, and Wei Yuan 魏源, eds., *Huangchao jingshiwen bian* 皇朝經世文編, 卷56, 張照「論樂律及權量疏」:「今日非法度之不立, 在奉行之未能. 請命有司按表成造尺秤法馬斗斛, 頒行天下, 再為申明違式之禁, 務使劃一. 并令直省將會典內權量表刊刻頒布, 使人人共曉, 或亦同之之一法也. 五方風氣不齊, 民俗所便各異. 然在官者有一定之程. 則能以我之至齊齊彼之不齊, 而不齊者亦齊. 其所不齊亦無害. 臣昔聞於聖祖仁皇帝者如此. . . . 必以為度量權衡, 國家本無定準. 假而民間各自為制. 浸假而官司轉從民制以為便. 此歷代度量權衡所以不同之本也.」

⁵¹ *Qingchao wenxian tongkao* 清朝文獻通考, 卷160:「朕見, 各省民間所用等稱. 雖輕重稍殊, 而尚不甚懸絕. 惟斗斛大小迥然各別. 不獨各省不同. 即一縣之內. 京城鄉村亦不相符. 此皆牙儂評價之人希圖牟利之所致也.」

weights and measures to dishonest intermediaries and emphasized the central government's initiatives in rectifying the chaotic practices associated with them. Soon after the decree of 1704, the central government abolished several province-specific measures, such as *guandong dou* 關東斗 (*dou* current east of Shanhaiguan) and *Shengjing jinshidou* 盛京金石斗 (*dou* current in Shenyang), and distributed the standard *tiedou* 鐵斗 (iron *dou*) and *tiesheng* 鐵升 (iron *sheng*) throughout the empire.

A similar approach to the problems of the weights and measures can be found in the late Qing:

In 1870 (the ninth year of the Tongzhi reign), the emperor issued a decree to the government ministry as follows; “The imperial censor Deng Qinglin 鄧慶麟 reported that in areas like Funing County, Yongping Prefecture of Zhili Province, the bottoms of *dou* 斗 and *hu* 斛 are made into opening part,⁵² [so to speak], so that dishonest merchants turn them to their own advantage. Further investigation is needed.” The governor of Zhili Province shall be ordered to send a strict order to such counties as Funing and Lulong under Yongping Prefecture that the *dou* 斗 and *hu* 斛 in question follow the standard models distributed by the Board of Revenue, thus effecting uniformity. If any province is found guilty of condoning arbitrary use of private *hu* containers, concerned governors are commanded to send a strict order to local officials in charge that any violation against the standard practice be investigated and prohibited completely.⁵³

Here, three points are noteworthy. First, like the Kangxi Emperor, the divergent practices of weights and measures were mainly attributed to the greed of merchant intermediaries. Second, the decree was triggered by the problem detected in Zhili Province and mandated the uniform measures of *dou* 斗 and *hu* 斛 in every province. Third, unlike the Kangxi Emperor, the central government did not distribute standard measures.

The three debates above emphasize the central government's role in standardizing and unifying weights and measures throughout the empire amidst the divergence and disunity in the system as a result of dishonest merchants who violated standards in their pursuit of profits. This line of thought locates the problems as rooted in the failure of private parties to use standardized weights and measures rather than in government regulations. Therefore, administrative power was focused on curbing private violations of the standard weights and measures. This approach diverged from the need to unify the institutions and regulations of weights and measures, suggesting that the central government's reform efforts constituted an administrative burden or a disruptive intervention into private practices. The following examples illustrate the central government's cautious

⁵² It seems that the drafter of the decree employed a metaphorical rather than literal use of words to indicating the flagrant misrepresentation of the *dou* 斗 and *hu* 斛 to the advantage of deceitful merchants.

⁵³ Xi Yufu 席裕福, ed., *Huangchao zhengdian leizuan* 皇朝政典類纂, 卷113「市易」: “同治九年諭, 內閣御史鄧慶麟奏, 直隸永平府屬撫寧等處, 所用斗斛, 以底作口, 惡級奸商藉此從中漁利, 請飭查等語。著直隸總督嚴飭永平府屬指撫寧盧龍等縣, 地方所用斗斛, 務當遵照部頒正式, 俾歸劃一。至各直省, 如不遵定例, 擅用私斛情弊, 并著各該督撫查明, 一體嚴禁, 以符定例。”

approach to managing weights and measures.

In an example of the government's reluctance to accept local innovations, the Yongzheng Emperor's response to the suggestion by Governor-General of Fujian Gao Qizhuo 高其倬 (served 1725–1729) was to use *fama* 法馬 (official balance weights) as the standard. Governor-General Gao reported that in Fujian Province, the weights of silver, copper coins, and grain paid to the provincial tax commissioner (*buzhengshi* 布政使) varied because his taxation agencies used only single pieces of standard *fama* distributed by the Board of Revenue, which had worn out and become lighter. When this happened, the provincial tax commissioner requested new standards; however, it took time for them to be delivered and they continued to collect taxes using the older, lighter standards while waiting for the replacements. Gao suggested that the Board of Revenue send the *fama* in pairs so that they could be immediately replaced, to which the emperor responded:

What is said in Gao Qizhuo's memorial is off-target, complicated, and not fitting to protocol. The *fama* distributed by the Board of Revenue carries standard weight in value, and the same is true of the distributed *tiehu* 鐵斛. The provincial tax commissioner of every province is required to construct with precision the *fama* to be used in his province on the model of the *fama* already distributed and to make sure that all parties keep using the standard weights and measures in unison. In cases where someone attempts to change the standard weights and measures in receipts and payments, that person ought to be strictly investigated and punished. This can be called a "normal way of doing business" (*jingchang zhi dao* 經常之道). How has it come about that the provincial tax commissioner's agency has employed only one piece of *fama* until it wears out, thus falling short of the standard weight value? Exchanging used *fama* for new ones at the Board of Revenue, as suggested by Gao Qizhuo, is too cumbersome a procedure, and sounds like a children's game. His proposal has not taken the real situations [of tax collecting] into account.⁵⁴

From a modern perspective, Gao Qizhuo's idea to retain the standard weight value of *fama* by replacing old weights with new weights was neither "cumbersome" nor a "children's game." Nonetheless, the Yongzheng Emperor's lukewarm response to Gao's innovative idea is anecdotal evidence of the Qing central government's resistance to implementing new procedural and regulatory reforms to achieve the empire-wide unification of weights and measures.

The Yongzheng Emperor's unenthusiastic response to Gao Qizhuo's reformatory suggestion arose from concerns regarding the official weights and measures used to collect taxes. A similar attitude of the central government toward achieving uniformity for private weights and measures is evident in the Qianlong Emperor's response to a suggestion in 1736 from the Governor of Jiangxi, Yu Zhaoyue 俞兆岳, who insisted that "achieving uniformity in the private weights

⁵⁴ Xi Yufu 席裕福, ed., *Huangchao zhengdian leizuan* 皇朝政典類纂, 卷113, 「市易」: "高其倬此奏迂闊鄙瑣失禮之甚。部中所頒法馬, 乃輕重合宜之式樣, 如所頒鐵斛一例之事, 各省布政使, 自然照此式樣較準, 不失毫釐, 製成法馬日日彈用, 并令閩屬地方劃一遵奉, 其或有出納之際, 加重減輕者, 皆當嚴查, 比較參處。此乃經常之道, 豈有錢糧總匯之布政司出納繁多, 專以法馬一副日日彈用, 以致銅質銷磨輕重失實之理, 且部中循環更換, 亦不勝其繁, 有同兒戲。高其倬迂闊若此, 宜乎福建各屬收解錢糧不等, 如奏摺所云也。"

and measures ought to be one agenda of the empire.” The emperor replied that the “uniform application of laws, as well as weights and measures, has been said to be a manifestation of the kingly rule [of a benevolent monarch] because [rulers] are deeply concerned with the daily usage and livelihood of the people as well as their customs and feelings. The argument for their uniformity is legitimate. However, disruption to the people’s lives as a result of radical changes [in the weights and measures] should be avoided.”⁵⁵

The emperor’s remarks implied that the implementation of uniform weights and measures was ideal for a sage ruler, but that if the weights and measures served their purpose despite their lack of uniformity, changing them would be disruptive. The early Qing central government’s commitment to uniform weights and measures and the rigorous supervision of their implementation by the provincial governments, as reflected by the Kangxi Emperor, gradually gave way to a cautious approach geared toward avoiding disruptions in their use in private practice. In this respect, the actions of dishonest merchants—intermediaries deemed to be in the perennial pursuit of selfish interests—were given too much credit for the issues arising from the broad variation and disunity in current weights and measures. The central government assigned most of the responsibility for investigating and punishing dishonest merchants to the provincial governments. More often than not, proposals for institutional and procedural reform and innovation to unify current weights and measures were dismissed as disruptive to the well-functioning status quo.

The provincial government’s attitude toward current weights and measures was centered on a legal approach to the problems caused by privately-constructed weights and measures, as put forth by Lu Ying 遼英 in his literary collection, *Chengqiulu* 誠求錄 (Records of sincere seeking), published in the eleventh year of the Qianlong Emperor:

As weight balances (*cheng* 秤) and grain measures (*hu* 斛) determine the weight and capacity of many things, they should have been constructed in accordance with the standards to unify customs and institutions. When investigating private weight balances and grain measures in the Luozheng District (Guangdong Province), their values (85) fell short of the legal standards (100). Moreover, the origin of the names of the balances and measures, such as *tancheng* 灘秤 and *tandou* 灘斗, is unknown. Unclear variations in the weights and measures and different prices of goods handled by merchants were bound to give rise to disputes in the market and inconveniences in trade. The *Qing Code* stipulates that everyone who falsified a government-issued *hu* 斛 (half bushel), *dou* 斗 (peck), *cheng* 秤 (balance), or *chi* 尺 (foot-rule) by augmenting or diminishing it, would be sentenced to sixty strokes with the heavy bamboo, and the government officer [who constructed or altered it] would receive the same penalty. The privately used *tancheng* 灘秤 and *tandou* 灘斗 should have been adjusted to the officially-used *simacheng* 司馬秤 and *cangdou* 倉斗 by increasing their capacity and weight, respectively. Instead, if the *simacheng* 司馬秤 and *cangdou* 倉斗 were used [to the exclusion of

⁵⁵ 高宗實錄, 卷19, 乾隆元年5月 10月條: “又條奏民間斛之制宜劃一。禁演扮淫戲以厚風俗等語。得旨。王者之道。同律度量衡。蓋以此民間日用最切之事。而風俗人心之所關也。宜令劃一之奏。是。但不可有欲速之心。致民間有所不便。則得矣。”

the *tancheng* 灘秤 and *tandou* 灘斗], then misunderstandings in the market would be avoided, and the price values of commodities would remain constant. The military agencies had strict orders to investigate and punish offenders, and villagers and *dibao* 地保 (local notables) of the district in question were notified that all transactions should be conducted in accordance with the established rules, using the *simacheng* 司馬秤 and *cangdou* 倉斗. The *dibao* 地保 were required to communicate this notice widely throughout the district so that within fifteen days the usage of the *tancheng* 灘秤 and *tandou* 灘斗 should have ceased.⁵⁶

Lu Ying confirmed that the disputes and confusion in the marketplaces of the Luozheng District stemmed from the proliferation of privately-constructed weights and measures, such as the *tancheng* 灘秤 and *tandou* 灘斗, along with the official weights and measures. His solution was to supersede the privately-constructed *hu* 斛 (for grain measures) and *cheng* 秤 (for weight balances) with the officially-used *hu* and *cheng*, such as *cangdou* 倉斗 and *simacheng* 司馬秤. To execute his proposed reforms, Lu Ying suggested the legal measure of punishing offenders.

In stark contrast, the following statement by the provincial tax commissioner office (*Buzhengsi* 布政司) in Zhejiang Province in the thirty-eighth year of the Qianlong reign (1773) illustrates a *laissez-faire* approach, recognizing what was already being practiced in the marketplace:

Your subjects have observed that although the *sheng* 升 and *dou* 斗 currently being used in the marketplace vary in name, the people have long been at peace with each other in using them, and moreover, they have not been newly created by individual store households, who rather have acceded to their convenience. Although the weights and measures constitute a part of the state's institutions, as seen in the monetary practices in the capital (Beijing) where a variety of silver weighing balances like *kuping* 庫平, *shiping* 市平, *nanshi* 南市, and *xishi* 西市 coexist in concord, the weight of the respective balances determines the value of silver money. Likewise, the current cases of *sheng* 升 and *dou* 斗 cannot be unified into one single standard unit, respectively. If the concerned censor's memorial [calling for eradicating market-specific *sheng* 升 and *dou* 斗 in violation of official standard ones] were adopted, the rice and grain merchants inside and outside of the capital would be thrown into confusion by such an abrupt change. Moreover, in the complicated course of issuing officially stamped *dou* 斗, clerks will have the opportunity to profit illegally, resulting in little benefit for the administration.⁵⁷

⁵⁶ Lu Ying 遼英, *Chengqiu lu* 誠求錄 [Record of sincere seeking]. 「爲飭諭斛秤宜遵定制以臻劃一事」:「照得秤斛兩項乃百物之受裁,以爲平準製造,有一定之式,不許增減,所同風俗一制度也。查羅定地方民間所用秤斛,按照成法,每石每斤,只得八五之數,名爲灘秤灘斗,不知何所由來。一州之中斗秤有大小之迥別,各行之內物價有貴賤之不同,市廛易起爭端,交易殊多不便。律載斛斗秤尺,作弊增減者,杖六十工匠同罪。況用灘斗灘秤較之司馬倉斗,勢須遞加。何若遵用倉斗司馬,既省周折而于價值,仍無損益。除移協營及行捕巡一体查禁外,合行出示曉諭,爲此示仰,闔屬里民地保人等知悉,嗣後一切交易,務宜遵奉定制斛用倉斗司馬,該地保遍行傳諭,通限半月之內,所有灘秤灘斗,悉行銷毀。」

⁵⁷ *Zhizhe chenggui* 浙浙成規 [Established rules for governing Zhejiang], *Guanzhen shu jicheng* 官箴書集成, vol. 6 (Huangshan: Huangshan Shushe, 1997) 「市廛牙鋪居民戥秤尺斛斗升聽從民便永禁官爲驗烙以免擾累」:「臣等覆查,市集所用升斗,既係有各項名色,歷來民間使用相安已久,并非鋪戶創設,自可聽從其便。況權度量衡,皆屬國家定制,即如京城錢行,有庫平市平南市西市諸名色,總以錢平之大小定錢價之低昂,通融經理。與升斗事同一例,勢有不能盡歸劃一者。若如該御史所奏...京城內外所有米糧行戶,一時驟令改易,事涉紛更。且驗烙官斗,輾轉領給,徒啓吏胥需索之端,於實政殊無裨益。」

Acknowledging the capital (Beijing) as the pacesetter, the Buzhengsi recommended a laissez-faire policy toward weights and measures as long as the market transactions were conducted in a stable and predictable manner. This suggestion was eventually approved and applied to the entirety of Zhejiang Province, and can be understood in the context of the mid-Qing economic prosperity, as by then the conventions for commodity transactions had been well established:

If following the suggestion by the concerned county, the measures would be inspected and stamped one by one, not only would yamen clerks avail themselves of the pretext to stir up trouble, but local villains will also take advantage of it to plot fraud. Moreover, the duties of local officials will become excessive, and given the large number of marketplaces and multitude of stores and residents within the boundaries of one district, its scales, foot-rules, *hu* 斛, *sheng* 升, and *dou* 斗 exceed a hundred, thousand, ten thousand, or [even] ten thousand times ten thousand in number. There is not time to crosscheck each [measure and weight] against the standards. If such duties are assigned to yamen clerks, they will diminish what is large, or augment what is small, causing countless problems. Still worse, [some villains] may enter into the marketplace to investigate [the weights and measures] with no stamped marks and attempt blackmail, causing unspeakable harm. This measure [suggested by the magistrate] claims to benefit the people in name, yet in reality, it will disturb them.⁵⁸

Finally, the local gentry class also partook in policy debates on and advanced suggestions regarding weights and measures. Wang Zhesheng's (dates unknown) 王喆生 suggestion reflects a particularly interesting perspective. Wang passed the civil examinations, the *jinsi* (進士) degree, in the twenty-first year of the Kangxi reign (1682), but spent the rest of his life as a member of the local gentry in Kunshan County, Jiangsu Province. The following excerpts are from Wang's letter to a local magistrate, in which he objected to the enforcement and supervision of official standards, fearing the high costs and provision of opportunities for fraud for corrupt officials and criminals:

The variations in today's rice prices are by no means derived from the differences in weight and the size of rice commodities. The rice price in the countryside and urban areas remains uniform; however, the [weighing and measuring instruments such as] *dou* 斗, *hu* 斛, and *fama* 法馬 remain as yet unstandardized. Moreover, not to mention the countryside, within several *li* 里 of given walled towns, the price of rice remains the same, but the *dou*, *hu*, and *fama* used by merchants differ from those in the east to those in the west, and from those in the south to those in the north. Because of this difference [in weighing and measuring instruments], there comes about a difference in price. In the past, Magistrate Wei had initially intended to impose a unified system [of weights and measures] to prevent fraudulent practices. However, he feared that stubbornly adhering to [the standards weights and measures] issued by the Board of Revenue might not be of help in bringing in merchants from all directions, resulting

⁵⁸ *Zhizhe chengui* 治浙成規, 「市廛牙鋪居民戡秤尺斛斗升聽從民便永禁官爲驗烙以免擾累」: “若如該縣所議, 逐件驗烙, 不特胥吏得以藉端滋擾, 卽地棍亦得借以圖詐。且地方官公務殷繁, 一邑之大四境之廣, 市廛之多, 牙鋪居民之衆, 其戡秤尺斛升斗, 何止百千萬億。若逐一親較, 則日不暇給。若仍委之書吏, 則以大爲小, 以小爲大, 其弊不可枚舉。甚而入市搜尋, 查無烙痕, 輒行圖詐, 其害有不可勝言者。是名爲便民, 實以擾民。”

in blocking the flow of rice, causing the people pain. Therefore to “benefit the people” (*bianmin* 便民) by “letting trade flow freely” (*tongshang* 通商), the merchants were allowed to adjust their measuring and weighing instruments slightly [vis à vis the official standards]. At that time, the merchants and people were willing to obey [the measure by the magistrate], and all parties [involved in market transactions] praised its convenience. [Thereafter], it reported to the superiors [that the measure] has become established as the rule, and [the current weighing and measuring instruments] have been inspected and stamped accordingly. Calculating what is most convenient and suitable [to the people] at a given time by penetrating into the people’s feelings is the affair of a truly wise government official.⁵⁹

Wang advocated a regime of local autonomy in defining and using weights and measures, as maintained by local governments. His rationale for this proposal lies in the promotion of trade, which he believed would genuinely benefit the people.

Conclusion

Unified metrological systems reduce the cost of assessing the value of traded commodities. As such, there is no doubt that the Qing government desired to usher in an empire-wide unified system of weights and measures. Only the central government could carry out such sweeping reform to achieve a unified system of weights and measures based on its official standards. Only the central government could determine and establish a system of weights and measures for the entire empire, mobilizing a vast network of central and provincial officials using a well-ordered hierarchy of local officials to do so.

However, the regulations on weights and measures proclaimed by the Qing government were not necessarily consistent with the principles and rationales underpinning the ideals of a unified system of weights and measures. While the official regulations on weights and measures were extended and developed over time, they were often contradictory and conflicting, producing a host of disputes and problems when they were applied in both official and market transactions. Nevertheless, following the Kangxi reign, there was a marked decline in the proactive and coordinating efforts of the central government to unify the practices of existing weights and measures. Providing the weights and measures worked on their own, reform was sidelined in favor of maintaining the status quo.

To ensure the use of its official standard weights and measures in market transactions, the Qing government copied and issued official prototypes of weighing and measuring instruments preserved in the central agencies to provincial governments. The provincial governments—and the Buzhengsi 布政司 (provincial tax commissioner office) in particular—were supposed to inspect and stamp the local weights and measures in accordance with the official standards.

⁵⁹ Wang Zhesheng 王喆生, *Suyan wengao* 素岩文稿 [Wang Zhesheng’s writings], 卷14, 「與李邑侯論法斛」: “但今米價之貴賤, 絕不因輕重大小而殊。鄉城之米價劃一也, 而斗斛法碼, 未嘗劃一。且無論於鄉, 即一城之中東西南北數里而止, 米價無有不同, 斗斛法碼之在牙行者, 東不同於西, 南不同於北也。此其不同之故, 殊於價耶。往年魏父母釐正之日, 意主劃一, 以杜奸弊。又恐拘於部頒, 則無以招徠四方之賈, 米壅不行, 仍為民病。故以通商者, 便民酌少廓之。爾時商民允服主客稱便。詳憲定制, 印烙遵行。夫通達下情, 以劑量時宜, 眞賢有司之事也。”

However, as this article demonstrates, there was a lapse in the distribution of the official standard weights and measures across the empire, as well as in the supervision of their usage, as time progressed. Consequently, an asymmetry in the available information on the standard weights and measures developed between the state and the market. This led to a discrepancy between the government regulations on weights and measures (formal rules) and the market conventions (informal constraints)—one that remained unresolved until the twentieth century, when Chinese governments (imperial, Republican, Communist) began unifying the country's weights and measures by introducing the metric system as the sole legal standard in China.

In addition to the policy issues arising from the Qing practices of weights and measures, there was a lack of consensus among the Qing leadership, including the emperors, provincial officials, and gentry. The Kangxi emperor led the reform effort to unify the existing weights and measures by becoming personally involved in defining the empire's weights and measures and disseminating these definitions through publication.⁶⁰ Later policy proposals tended to limit the scope of their approach, with a more cautious route taking preference. The rigorous enforcement and stringent supervision of the official standards was implemented to eliminate the dishonest practices of merchants in defining and using weights and measures for selfish gains. However, the government's reservations toward taking a more interventionist approach were the result of a fear of disrupting the status quo of existing market customs. Despite their emphasis on the different roles of the government in managing the weights and measures for market transactions, both aimed to stabilize market transactions. It was not until the late nineteenth century that the unification of weights and measures across the country began to be considered essential for promoting the growth of the national economy in the face of aggression from other countries, whose unified metrological system provided a model for China to emulate.⁶¹

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⁶⁰ Endymion Wilkinson, *Chinese History: A New Manual* (Cambridge, Massachusetts and London: The Harvard University Asia Center for the Harvard-Yenching Institute, 2012), 562.

⁶¹ Wu Chengluo (1937, 281–284).

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