

MARIA THERESA'S THALER: A CASE OF INTERNATIONAL MONEY

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INTRODUCTION

Today we are seeing the advent of the euro and the increasing discussion of "dollarization," the adoption by a country of the U.S. dollar or other major currency (such as the euro) as its currency.¹ This represents something of a return to the past in that one can argue that prior to the rise of national currencies in the 19th and 20th centuries, dollarization—in the sense of a country using another country's money—was common [Helleiner, 1997].

One particularly noteworthy historical example of an international money is the silver coin known as the Maria Theresa thaler or taler (MTT). (Appendix A provides a physical description of the coin.) The story of the rise and subsequent decline in the role of the MTT is the reverse of the story of the rise of national monies. My goals in providing a rich description of a particular case are to illuminate the general phenomenon and perhaps to provide an entertaining anecdote for teachers of international finance or money and banking.

The next section discusses the history of the MTT, followed by some analysis of the reasons for its waxing in the 19th century and its subsequent waning. The paper concludes with a summary.

HISTORY

Between 1741 and the present, mints throughout Europe (plus Bombay) have produced some 390 million or more MTTs (also known as Maria Theresa or Levant dollars), amounting to about 300 million ounces of pure silver.² The only other coin of the modern era that was arguably more important in international trade than the MTT was the Mexican peso or Mexican silver dollar [Andrew, 1904; Pond, 1941b]. If the Mexican dollar provided a great part of the silver that Flynn [1995] credits with providing the basis for the development of world trade from the 16th century, the MTT provided the silver that fueled Europe's trade with the Middle East, the Arabian Peninsula, and the Horn of Africa in the 18th and 19th centuries.³

Eight Hapsburg mints and the successor Austrian mint in Vienna produced more than three-quarters of the documented mintages (Table 1). For reasons we discuss below, from the mid-1930s to 1961, mints in Birmingham, Bombay, Brussels, Lon-

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TABLE 1
Reported Mintages of Maria Theresa Thalers
for Hapsburg or Austrian Mints

Years	Mint	Mintage
1741-1750	Hapsburg Mints	Unknown
1751-1866	Hapsburg Mints	82,719,621
1751-1781	Hall, Günzberg, Kremnitz & Vienna	30,681,337
1782-1866	Karlsburg, Kremnitz, Prague & Vienna	37,209,331
1820-1866	Venice & Milan	14,828,953
1867-1915	Vienna	115,495,163
1920-1929	Vienna	53,676,003
1930-1937	Vienna	3,613,165
1751-1937	All Hapsburg or Austrian	255,503,952
1946-1955	Vienna	109,739
1956-1970	Vienna	10,189,577
1971-1980	Vienna	25,206,475
1981-1990	Vienna	12,841,973
1991-1998	Vienna	480,370
1946-2000	Vienna	48,850,513
1751-2000	All Hapsburg or Austrian	304,535,465

Sources: Pre-1945—[Hans 1950]; Post-WWII—Austrian Mint.

don, Paris, Rome and Utrecht also produced the MTT (Table 2). (Appendix B provides some information on other possible mints and on a gold variant.)

By the mid-19th century the MTT had come to circulate from the northwest coast of Africa to Madagascar and from the Turkish coast of the Black Sea to Muscat [Stride, 1956]. In time the MTT came to be legal tender in many countries well into the 20th century. In particular, it survived as legal tender in Saudi Arabia (until 1928), Ethiopia (until 1945), Yemen (until 1962), and Muscat and Oman (until 1970).⁴

Countries where the coin circulated or where one can still come across it include Albania, Algeria, Bahrain, Borneo, Cameroon, Central African Republic, Chad, Djibouti, Egypt, Eritrea, Ethiopia, Ghana, Kuwait, Lebanon, Libya, Malta, Mauritius, Moldavia, Morocco, Niger, Nigeria, Palestine, Saudi Arabia, Serbia, Somalia, Sudan, Syria, Tanganyika, Togo, Tunisia, Turkey, Uganda, the United Arab Emirates, Walachia, both Yemens, and Zanzibar. Rossi [1999] provides photos of MTTs with counter-stamps from the Azores, Brazil, China, Java, Kuwait, Madeira, Mozambique, the United Kingdom, and the United States. The coin traveled not only in trade, but probably also with pilgrims returning to, for example, Java or Borneo, from the Hajj (pilgrimage) to Mecca. Peng [1994] reports that the MTT (which he calls the Double-Headed Silver Eagle) was among the foreign silver coins circulating in China during the Qing Dynasty period (1644-1911).

The first thaler with the portrait of Maria Theresa dates to 1741, the year after she acceded to the throne. The following year saw the striking of two thalers with her portrait, one in Vienna and one in Kremnitz (then Hungary, now Slovakia). Maria Theresa's husband, Franz Stephan of Lorraine, was elected Holy Roman Emperor in 1745 and reigned as Franz I until his death in 1765. As his wife, Maria Theresa then

TABLE 2
Reported Mintages of Maria Theresa Thalers for non-Austrian Mints

Years	Mint	Mintage	Sources
1870s	Birmingham	Unknown	Ofonagoro [1979]
1935-1939	Rome	19,446,729	Italian Royal Mint records ^a
1937-1938	Paris	4,512,750	Hans [1950]
1936-1941	London	14,724,016	Regoudy [1992]
1937-1938	Brussels	9,845,000	Royal Belgian Mint
1939	Utrecht	116,060	Boegheim [1991]
1940-1942	Bombay	18,864,576	Stride [1956]
1946	Paris	5,522,750	Hans [1950]
1957	Paris	2,074,456	Behrens [1969]
1949-1961	London	5,435,054	Broome 1972]
1949-1955	Birmingham	3,428,500	Behrens [1969]
1954-1957	Brussels	1,150,024	Royal Belgian Mint
1935-1961	All non-Austrian	85,119,905	

a. Giulio Bernardi (Italian Numismatic Association).

bore the title of "Empress" and this title appears on her coins from 1746 until her death in 1780. Unfortunately, the earliest mintage figures date only to 1751.

On September 21, 1753, Empress Maria Theresa signed a coinage convention with the Prince Elector of Bavaria that, amongst other things, defined the silver content of every type of coin and fixed the ratio between the gulden and thaler at 2:1. Thereafter, coins meeting these standards came to be known as Convention thalers.

After Maria Theresa died in 1780, her son and successor, Joseph II, permitted the mint at Günzburg (today in Bavaria, but at that time Hapsburg territory) to continue striking thalers with the 1780 dies. A decree of 1783 ordered the Günzburg mint to strike the 1780 coin for any merchant who provided the metal. The reason for continuing the production of the MTT, even for private parties, was the demand from the Levant for this now familiar coin. The decision to use the existing dies essentially fixed the design of the MTT to the present. Since 1780, all the coins have been re-strikes carrying the date 1780.⁵ This does not mean that these were the only Hapsburg thalers to circulate in the Levant. Earlier and later thalers also migrated, as Freeman-Grenville [1977] discusses with respect to a collection of thalers from Yemen, but the 1780 MTT came to dominate.

A key figure in the spread of the MTT was Count Johan von Fries (1719-1785). Of Alsatian origin, he ably served the Hapsburg Empire, and as a result, won a number of favors [Flandrin, c.1997]. One was the monopoly on the delivery of all thalers to Turkey, both those minted on his behalf and those minted for other merchants [Jungwirth, 1991]. The thalers moved through Trieste and were important in the trade of coffee, which was shipped from the former port of Al Mukha (Mocca) in Yemen. By the 1760s, travelers reported encountering MTTs in Arabia. The Arab merchants, in turn, used the silver for trade with India and China.

The first accounts of MTTs in Ethiopia date from 1769 where they started to show up in the coastal port of Massawa primarily as payment for slaves [Pankhurst, 1979-80]. At that time, and for many years before, Spanish (Mexican) dollars had circu-

lated throughout the Middle East, at least in coastal ports, but gradually the MTT came to displace them. The MTT also penetrated into the interior of Ethiopia, though this occurred slowly because it took some time for rural inhabitants to come to prefer them to bars of salt or bolts of cloth as money. Still, eventually the MTT won out and Ethiopia began to run the balance of trade surpluses necessary to facilitate the growth of the money stock.

Vienna (1751-1919) and Günzberg (1763/4-1802) were the primary mints for thalers in the Hapsburg Empire. However mints in Karlsburg (1785-1803), Kremnitz (1781-1786), and Hall in the Tirol (1751-1765 or so) also produced MTTs in the 18th century. Leypold [1975] argues that Milan commenced production in 1787.

Jungwirth [1991], based on earlier sources, reports that from 1785 on, the French had to pay for silk with silver. After the exportation of French silver coins was forbidden, the silk importers used MTTs and other foreign coins. The thalers came from Augsburg and Günzberg and left through Marseilles. This explains the (apparently abortive; see Appendix B) interest in Marseilles in producing MTTs. The thalers that passed through Livorno, Genoa, and Trieste to pay for coffee, silk, and other imports from the Levant came from Hall.

Pankhurst [1963b] reports that although James Bruce, traveling in Ethiopia in 1773, made no mention of the MTT, by 1805, Henry Salt reported that the coin was well known. Freeman-Grenville [1977] infers from the omission of any mention of it in J.L. Burckhardt's description of the money found in the Hijaz that it had not reached Saudi Arabia by 1814 though it was already known in Yemen. The collection of MTTs from Yemen that he describes includes specimens from Günzberg, Hall, Prague, and Vienna.

In 1805, Napoleon abolished the Holy Roman Empire and the mint at Günzberg closed. Between 1805 and 1815, MTTs with the 1780 date were produced, but at a much-reduced rate and Fischel [1912] does not specify at which mint. After 1812, production started to pick up again. Although Fischel shows mintages for Milan and Venice from 1820 on, the Treaty of Vienna returned Milan to Austria in 1815; the mints started operating at that time and Leypold argues that Milan started to produce MTTs immediately and that Venice started in 1817. Later, the mint at Prague (1836-1842) briefly produced the MTT. However, the main source was the mint in Vienna.

The MTT circulated widely in the Mediterranean. For instance, Jungwirth [1991] reports that the MTT was legal tender in the United States of the Ionian Isles from 1836 to 1877.⁶ The MTT remained in circulation in Greece until 1882.

In 1860, the Hapsburgs lost Lombardy and Milan to the newly created Italian state and the Milan mint stopped production of the MTT. In 1866, as a consequence of its defeat in the Austro-Prussian War, Austria lost Venetia and Venice and so production ceased there too. From 1867 on, the mint in Vienna therefore became the sole producer of the MTT for the Hapsburg Empire.

The MTT had lost its status as legal tender in Austria in 1858. However, an imperial edict of 19 September 1857, had given the mint a patent to continue to restrike the 1780 MTT so that the coin would continue in production for trade with the Levant. The Austro-Hungarian government continued to mint the MTT throughout the 19th century at the request of traders who would provide the silver for the Vienna

Mint to mint the coins, for a small fee [Stride, 1956]. Within the Empire, the MTT continued to be legal tender in Bosnia-Herzegovina until 1892 [Pond, 1941a].

Hahn [1996] reports that the opening of the Suez Canal (1869) facilitated the delivery of MTTs to the countries bordering the Red Sea. A year earlier, Britain bought MTTs from the Vienna Mint to finance Napier's punitive expedition into Abyssinia [Hahn, 1996]. However, even before the opening of the Suez Canal, there are reports of the use of MTT by the Majeerteen clan on the Horn of Africa [Durrill, 1986]. Durrill mentions accounts from before 1840 to the 1880s of MTT being used for dowries, for local taxes, and as an annuity (360MTT/annum) from the British to the local Sultan to render assistance to British survivors of shipwrecks.⁷ Travelers' reports show the MTT in Northern Nigeria, Uganda, and Zanzibar [Thomas, 1952]. We have accounts from the 1870s stating that the going rate for a male slave, aged 15-18, in the Southern Sudan was 15-20 MTTs [Moore-Harell, 1998].⁸ The Anglo-Egyptian Expeditionary Force for the relief of Khartoum in 1885-86 brought MTTs with it [Deacon, 1943; 1950].

Estimates of the money stock in Lagos in 1880 indicate the existence of substantial private holdings of MTT exceeding the stock of British currency in the Lagos Treasury by 30 times [Ofonagoro, 1979]. Apparently the local population preferred MTTs to British currency and the MTT remained legal tender from 1861 until its demonetization in 1880. For a period, the official value (against sterling) of an MTT in Lagos exceeded their cost in Europe, and local merchants arbitrated the discrepancy.⁹ Demonetization brought with it a prohibition on further importation of MTTs, real or counterfeit.

In 1885, Italy occupied the former Egyptian port of Massawa. A debate followed about what money Italy should introduce in its new colony [Pankhurst, 1963a]. Some advocated minting MTTs using the dies still resting in the Milan and Venice mints, arguing that using the dies was legal because the MTT was no longer legal tender and the Austrians were minting the MTT for private parties. Minting Italian MTTs would also be profitable as the Austrian brassage of 1.5 percent appeared to exceed costs.¹⁰ However, the Italian government, concerned about its relations with an important neighbor, wanted the Austrians to agree to this proposal. In 1887, the Italians commenced negotiations that broke up quickly over Austrian unwillingness to cede minting rights.

In the Ottoman Empire, the government issued a 20-piastre piece in an attempt to oust the MTT [Deacon, 1943]. However, between 1884 and 1889, the Emperor Yohannes IV sent about one-third of a million MTTs to the Ethiopian community in Jerusalem to pay for the construction of a church in honor of the Virgin Mary [Pankhurst, 2000b].

The MTT remained popular in East Africa. After the German East Africa Company was established in 1888, it prohibited the importation of the MTTs into Tanganyika in 1893, and attempted to withdraw them from circulation in 1896 [McCarthy, 1976]. Similarly, the German authorities in Togo and Cameroon banned the importation of the MTT in 1889, also with less than full success.

In 1889, Italy claimed Ethiopia as a protectorate in the treaty of Ucciali. In 1888 production of the MTT in Vienna for sale to Italy spiked to finance its campaign in Eritrea and its failed attempt to conquer Abyssinia. In 1890, the Italians attempted

to introduce their own coins, the *tallero Eritreo* and colonial 50 centessimi and one- and two-lira coins. They minted a total of 200,000 *talleri* (in 1890 and 1896) and 600,000 *talleri's* worth of lira (at the official conversion ratio). Still, the *tallero Eritreo* was a complete failure. Pankhurst [1963a] suggests three reasons for the failure. First, the fineness was 0.800 rather than the 0.8333 of the MTT.¹¹ Second, the Italians fixed the value of the *tallero* at 5 lira, which overvalued the lira.¹² Third, the authorities did not demonetize the MTT.

The Austrian Law of 1892 established a gold standard for the Austro-Hungarian Empire, and demonetized silver. Still, Section 22 of the Act explicitly recognized the MTT as *handelsmünze*—trade money—rather than *Kronenwahrung*—crown currency [Stride, 1956]. The Vienna Mint turned out some 23 million MTTs between 1892 and 1897, destined in large part for Italy to support Italy's colonial ambitions. For instance, after the disastrous battle of Adowa (1896), Italy paid Menelik two million MTTs in war reparations.

In Ethiopia, Menelik II introduced his own coin, the *Birr*, in 1894 (and again between 1899 and 1904) of the same size and weight as the MTT and at a fineness of 0.835, which he had minted in Paris. Menelik's coins proved to be too few in number (approximately 900,000) to displace the MTT.¹³ This coin came also in denominations of one-half, one-quarter, one-eighth and one-twentieth *Birr* and these did circulate.¹⁴

Gervais [1982] reports that the French government used the MTT in Central Africa but tried to eliminate them in West Africa. As late as 1901, the British colonial government still accepted MTTs for some official transactions in Southern and Northern Nigeria [Ofonagoro, 1979]. However, in 1902, the colonial government in Nigeria banned the use of "primitive money," a term for such currencies as cowry shells, manilas (horseshoe-shaped metal bars) and the "ubiquitous Maria Theresa dollar" [Hawkins, 1958]. Apparently primitive money continued in use until the government's compulsory redemption of several forms in 1949.

In 1905, Menelik granted the National Bank of Egypt a fifty-year concession to establish a banking monopoly in Ethiopia. The resulting Bank of Abyssinia had the right to hold all government funds, issue government loans, print bank notes and mint coins [Schaefer, 1992]. In 1914-15, the Bank issued bank notes denominated in thalers and these circulated in Addis Ababa, primarily among Europeans [Pankhurst, 1965].¹⁵

One operational problem with the MTT as money was that it came in only one denomination. Menelik's *birr* and the *tallero eritreo* had octal and decimal subsidiary coins, respectively, but neither of these existed in any quantity. What apparently was more common was the use of commodities for small change. Thus, in Ethiopia we see use of bars of salt, lengths of cloth, iron objects, copper bracelets, beads, and cartridges [Pankhurst, 1962]. In East Africa (Uganda to Zanzibar) we find accounts of exchange rates of the MTT against cowry shells. From West Africa we also have accounts of exchange rates of the MTT against cowries and other local or "primitive monies" but also, at least in Chad, against Bapterosses, a type of porcelain bead.¹⁶

Between 1915 and 1920, Vienna minted no MTTs because World War I and the collapse of the Hapsburg Empire interrupted production. In 1919, the Vienna Mint became the sole mint for the new Austrian Republic and the Republic claimed the succession rights to the Hapsburg Holy Roman Empire for the Mint. Unfortunately,

the new monetary law of 1924 did not mention the MTT. Still, Hirsch [1967] reports that although there was some diplomatic dispute about the possibility of other countries producing the MTT, eventually the international community acceded to the Austrian claim for a monopoly.

In 1918 during the reign of Victor Emmanuel III, the Italians again tried to introduce their own thaler in Eritrea (the *tallero d'Italia*, aka *tallero veneto*), which, however, never found favor [Deacon, 1943] and of which only about a half-million were minted. The design was strikingly similar to that of the MTT and the purity was 0.835 fine, but the coin differed in some crucial details that reduced its acceptability. There was another, probably more serious problem that may have limited the number introduced into the colony. During WWI, the price of silver rose sharply, peaking in 1919, before plunging precipitously in early 1920 [Leavens, 1939]. With Italy on the gold standard, maintaining the colony on a silver standard would initially have been extremely expensive.¹⁷

During the 1920s, Vienna struck several tens of millions of MTTs. However, in the first half of the 1930s, Vienna produced fewer than 4 million. Several factors were probably responsible. First, the Depression reduced the demand for silver, and the price of silver fell by about 50 percent between the mid-1920s and the early 1930s. Second, it is possible that speculators substituted gold for silver in anticipation of an increase in the official price of gold.¹⁸

In 1931, a little more than a year after becoming Emperor, Haile Sellasie created the Bank of Ethiopia, which took over the assets of the Bank of Abyssinia. As part of the reform, Haile Sellasie introduced decimal denominations but his coins too did not circulate widely and the MTT continued to provide the bulk of Ethiopia's money.

Between 1934 and 1936, Italy invaded Abyssinia. This provided the principal Fascist leaders, Pietro Badoglio, Rodolfo Graziani and Attilio Teruzzi, with an opportunity to loot the country. For instance, Badoglio reportedly appropriated half the 1.7 million MTTs the Italians seized from the Bank of Ethiopia and used the proceeds to build a villa in Rome [Pankhurst, 2000a].

In 1935 Italy prevailed upon the Austrian government to cede to it the minting rights for the MTT. Gervais reports that Mussolini cited the 19th century production in Milan and Venice as precedent for his request. The agreement between the Austrians and the Italians was that Italy would have the right to mint the MTT for 25 years. During this period the Vienna Mint undertook to mint no more than 10,000 MTTs per year and to decline all external orders. The agreement also stipulated that the Vienna mint would hand over the necessary dies to the Royal Italian Mint [Hans, 1961]. Hirsch [1967] cites a report that the MTTs Mussolini produced were of indifferent quality and inadequate quantity. However, the fineness of the Italian MTTs was 0.835, like that of its earlier *tallero d'Italia*. Moreover, the UK Royal Mint reported that the Italian coins were of quality workmanship. As far as quantity is concerned, Italian records show that the Italian Royal Mint produced 19.5 million MTTs.¹⁹ The charge of an inadequate quantity may have a different origin.

Before their invasion of Ethiopia, the Italians allowed the official exchange rate of the lira against the thaler to fluctuate. This was important because between 1933 and 1937, the United States purchased silver, driving up its value [Friedman, 1992].

With the lira defined in terms of gold, the official lira-thaler exchange rate rose from 4.75 in November 1934 to 12.5 a year later.

After their invasion of Ethiopia and consolidation of their three possessions—Eritrea, Ethiopia, and Italian Somaliland—the Italians attempted to eradicate the MTT [Pankhurst, 1970a]. However, in order to reduce the cost of their occupation, they again adopted a fixed exchange rate of five lira per MTT, which proved to be a mistake because it created an opportunity for arbitrage [Schaefer, 1996].

The Italians refused to mint MTTs for private parties for export to Ethiopia so merchant banks approached various non-Italian mints with a request that they produce the coins. In 1935, the Monnaie de Paris made its own dies; however, it did not start producing until 1937 [Regoudy, 1992]. The first non-Italian mint actually to produce the MTTs was the Royal Mint in London (in 1936), at the request of the bankers, Johnson Matthey & Co. Before producing the MTTs the Controller General of the Royal Mint, Sir Robert Johnson, sought a legal opinion. The eminent jurists he queried ruled that because the coin bore the portrait of a 200-year old monarch of a state that no longer existed and were of a denomination long superseded, the MTTs were simple metallic disks with a design, despite the custom of referring to them as money [Regoudy, 1992]. The British further argued that Vienna had abrogated any claim to monopoly by turning the dies over to Italy, and the Italy's refusal to mint MTTs for private parties meant that any rights accorded to Vienna had ceased to exist [Stride, 1956].

In 1937, the Monnaie de Paris and the Royal Belgian Mint in Brussels also started producing the MTT; the Belgians did so under contract to Samuel Montagu & Co., a rival firm to Johnson Matthey. Stride [1956] reports that these versions were not as scrupulous copies of the originals as London had produced and so were not as acceptable in the Middle East and East Africa. Still, merchants brought in MTTs minted abroad, exchanged them for lira in Ethiopia (at the lower market rate rather than the official rate), exported the lira via Djibouti and Aden, and then sold the lira back to the Fascist government through its banks in Italy [Schaefer, 1996]. In early 1937, Italy gave up the 5-to-1 exchange rate and increased the official rate, but apparently the official rate lagged the blackmarket rate by about 5 lira per thaler [Pankhurst, 1970a].

Pond [1941a] reports that in 1937, an agreement between England and Italy led to a cessation of coining in London. However, Pankhurst [1970a] and Regoudy [1992] report that London still minted some 5 million MTTs in 1938, though it did not mint any in 1939. In 1938, the Royal Dutch Mint in Utrecht started producing the MTT [Boegheim, 1991]. (The outbreak of WWII prevented the planned shipment of the coins to Aden; all but 60 were subsequently melted down.) In 1938, Hitler seized Austria and so until the end of World War II the Vienna Mint produced only Reichsmarks.

London resumed minting MTTs in 1940, the war having rendered moot any agreement with an Axis power. The English also shipped dies to India, enabling the Bombay Mint to produce almost 19 million MTTs between 1940 and 1942. However, the purpose of all this activity now was counter-attack, not arbitrage. The Anglo-Indian forces used these MTTs when they drove the Italians out of Ethiopia, Eritrea and Italian Somaliland [Thomas, 1952; Stride, 1956; Miller, 1999]. From the British victory to

the end of World War II, the MTT again became legal tender in Ethiopia. In 1945, a decree and subsequent minting (in Philadelphia) of Ethiopian dollars put an end to the practice [Wasserman, 1946]. In 1946-47, the Ethiopian government shipped numerous MTTs to the United States to be melted down and minted into Ethiopian dollars [Hans, 1951].

After the war, some production of MTTs outside of Austria continued. A mint in Birmingham produced 3.5 million between 1949 and 1955 for the merchant bank Samuel Montagu & Co., and the London Mint produced 5.4 million between 1949 and 1961. Brussels also produced a little over 1 million between 1954 and 1957, also for Samuel Montagu.²⁰ Lastly, Paris minted some 5.5 million in 1946 and 2 million in 1957.

In the 1950s, and for many years before, Aden was the main entrepôt for the MTT [Stride, 1956]. Apparently schroffs (merchants) bought the MTTs from bullion brokers and sold them to Arab trading companies and Bania and Jewish merchants who in turn sold them to Arabs and Somalis.²¹

Austria also resumed minting the MTT in 1946. It has since minted the MTT every year (except 1950), to the present. Between 1946 and 1955, the Vienna Mint produced an average of 10,000 coins per year, in rough conformity with the agreement with Italy. However, in 1956, Austria regained its independence. Also, Hirsch [1967] reports that in 1957, the Royal Mint had won a case in the Italian courts (on appeal) where it sought to enjoin a private syndicate from producing gold sovereigns in imitation of the British coin that Britain had stopped minting in 1925, when it went off the gold standard.²² The Royal Mint therefore instructed the private mint in Birmingham to cease production [Regoudy, 1992] though it continued itself to produce MTTs. In 1957, then, Birmingham, Brussels, and Paris ceased production and the Vienna Mint stepped up production.

When Austria's agreement with Italy ran out in 1960, the Austrian government was anxious to restore its monopoly. It therefore contacted the British and requested that the Royal Mint cease producing the MTT. The Royal Mint acceded to the Austrian request and in 1961 made its last MTT.

The MTT still circulated widely in the Middle East. For instance, in the 19th century and until World War I, MTTs served for salary payments in Bahrain, especially for pearl divers [Darley-Doran, 1995]. As a result, the local value of MTTs in terms of other currencies fluctuated with the pearling season. After WW I, pearl exports declined as cultured pearls from Japan became more common. Still the MTT remained an important part of the circulating medium.

In 1962 a revolution in North Yemen brought a government intent on modernizing the country to power. This government introduced its own currency; until then the MTT had been legal tender. When Bahrain announced that it intended to introduce its own currency, *The Economist* reported "For all practical purposes, most private transactions are still based on gold in the form of British sovereigns, and Maria Theresa thalers. This is true even in Kuwait, its dinar notwithstanding" [1 August 1964]. Muscat and Oman did not introduce a national currency before 1970. Instead, locals used Kuwaiti and Bahraini dinars, Muscati, Dhofari and Omani baiza, MTTs, and Gulf rupees [Symes, undated].

The total Austrian production since the resumption of minting after WWII has amounted to almost 49 million pieces. Of those, 46 percent were minted in the three years 1975-77. Commercial banks in Britain, Switzerland, and Vienna provided the silver and all the coins were shipped directly to Jeddah.²³ Flandrin [c1997] reports that this demand represented silver speculation by various Saudi parties in alliance with the Hunt brothers, and followed the rise in oil prices. The Hunt brothers continued to accumulate silver until 1980 [Barnhill and Powell, 1981]. After the collapse of the silver "bubble," the speculative demand disappeared.

The most recent account that I have found of the MTT still functioning in a monetary role comes from rural Ethiopia. Apparently in 1982, the wage for a child shepherd was 12 MTT per annum [Klinge, c.1999].

Today, the Vienna Mint still produces small numbers of MTTs for collectors and jewelers (as an exotic and attractive element rather than as a source of silver; see below). It sells the coins in bulk to dealers who then retail the coins. In 2000, it sold 9,721 MTTs.

Before leaving the history and turning to the economics of the MTT, it is worth pointing out that in many places the MTT not only performed all the usual functions of money (medium of exchange, store of value, and unit of account), but also served a number of other non-, or at least less, commercial functions. In Ethiopia it became a unit of weight for gold [Pankhurst, 1970b]. Elsewhere in sub-Saharan Africa, it formed part of African matrimonial negotiations [Gervais, 1982]. Griffiths [1938] reports its use as an amulet to ward off the evil eye. Throughout the Middle East and Africa, the MTT proved a ready source of silver for jewelry and silversmithing. Regoudy [1992] provides several contemporary illustrations from the Middle East of the use of MTTs for women's jewelry, though this represents savings as much as adornment.²⁴

INTERNATIONAL MONEY VS. NATIONAL MONEY

Whether a coin (or more generally, money) comes to be used outside its country of origin depends both on its characteristics and on the need for it. That is, the issue is one of the supply of a suitable money and the demand for it. Both are necessary and neither is sufficient.

Mundell [1999] argues that the usefulness of a currency as international money depends on its stability. This, in turn, depends on four factors: strength of the issuing state, fallback value, stability of monetary policy, and size of transactions domain.

The strength of the issuing state may have been a factor in the very earliest days of the MTT, but clearly was not after the end of the Hapsburg Empire, and probably not for a century before that. For the MTT, the fallback value was the most critical feature in generating the initial acceptability of the MTT outside its borders, with the other factors being derivative or irrelevant. In the earliest treatise on the subject of international money, *A Discourse Upon Coins*, which Bernardo Davanzati published after lecturing to the Florence Academy in 1588, Davanzati pointed out that state money had its value by government fiat whereas commodity money had its value from the supply and demand for bullion. State money was valid only within the boundaries of the state whereas commodity money was valued everywhere.²⁵

The stability in monetary policy derived from the MTT's character as commodity money. As the British argued in 1936, the MTT was simply a lump of silver, standardized as to size, fineness and appearance. The Hapsburgs, the Austrians, and all later imitators realized that the acceptability of the MTT rested on the standard, not on fiat, and so adhered to the standard. Furthermore, the beautiful and ornate design made counterfeiting difficult, and the lettering on the edge prevented undetected clipping (see Appendix A). Almost none of the extant articles on the MTT mention—either in the form of travelers' tales or examples of fraudulent coins—instances of sub-par counterfeiting.²⁶ Chippola makes the general point about trade currencies that "The maintenance of stable fineness was very important for the destiny of a coin and this importance was in direct correlation to the difficulty of ascertaining the fineness at the moment of payment" [1967, 25].

Stability in monetary policy (that is, a lack of debasement) does not mean price stability. As Leavens [1939] shows, and as I have discussed cursorily, silver prices have fluctuated dramatically over the MTT's lifetime. Also, seasonal changes in demand can cause price fluctuations since the supply of currency is relatively inelastic. In addition to the accounts from Bahrain's pearl industry (above), Edo [1975b] points out this seasonal fluctuation was a problem in Saudi Arabia, where the Hajj induces a seasonal influx of pilgrims. This price instability is a well-known weakness of commodity money and one that became avoidable with the development of (domestically) stable fiat money.

The size of the transactions domain, the last of Mundell's four factors, is somewhat tautological: the MTT is useful as international money because it is used in many countries. The transactions domain reflects both supply and demand and what reduces the tautology is a situation in time. Initially, a large economy will presumably have a large currency circulation, all other things being equal, some of which will be available for use outside its borders. The demand aspect of the transactions domain reflects the social contract or network nature of money [Lagerspetz, 1984]. If some people come to use MTTs then others may come to do so too.

The size of the transactions domain obviously was a factor in the MTT's acceptability for many years. The process of replacing international monies such as the MTT (and the Mexican dollar and others) was not one of simple erosion. Instead it took place in a context of a changing geopolitical environment in which the geographical scope had to expand before it could contract.

During what Robinson [1964] calls the Commercial Era (1500-1850), the MTT's geographical reach expanded. The Commercial Era was a period of European exploration and the development of trade, and it was trade that spread the MTT.

Cohen [1998] argues that from the Treaty of Westphalia (1648) on, we have seen the diffusion of the idea of the sovereign state with its symbols: one army, one flag and one currency. However, as Helleiner [1997] points out, the creation of a national money coterminous with the national territory is really a creation of the 19th century and later. It began first in the United Kingdom and Continental Europe, and then radiated out.

As we have seen, the spread of the MTT and similar trade monies continued well into the Exploitative Era (1850-1914) during which period the European powers acquired many of their colonies, and especially extended their reach inland into Africa.

However, during this period governments in the metropole (Western Europe and North America) finally developed an initial solution to the problem of creating confidence in fiat money in a public cognizant of the history of debasements [Sargent and Velde, 1999]. It took from the 14th to the 19th centuries for the standard formula to develop: the government should mint small coins whose face value should be greater than their commodity value, limit the total production of such coins, and provide for convertibility with unit money. At the same time, countries also moved toward the practice of using coins for small denominations and notes for large [Timberlake, 1974].

The adoption of the gold standard was frequently the transitional event. The adoption brought with it the issuance of silver and copper subsidiary coins with a commodity value below their face value, but convertible at will into gold. The demonetization of silver in the metropole also helped bring about the decline of the trade dollars because it removed the colonies from their transactions domain [Andrew, 1904].

The development of the concept of national money also depended on the development of the technology to produce consistent, well-made coins [Sargent and Velde, 1997] and on the rise of nationalism. Fiat money may have a value in trade because it is of uniform quality [Haegler, 1997], demonstrated by the quality of production. Lastly, as Helleiner [1998] argues, currency contributes to a sense of national identity in numerous ways. For instance, as the ideology of nationalism spread, national leaders saw in money a powerful way to disseminate national symbols.²⁷

The metropolitan governments then applied this idea of national money to the monetary systems they created for their colonies. Toward the end of the Exploitative period, as we have seen above, all the Colonial powers (British, French, German and Italian) sought to replace the MTT and other "primitive money" with their own coins and notes. The motives surely included the extension of imperial symbols, linking them together with local images,²⁸ a civilizing mission that included the introduction of a more modern monetary system made up of standard units and their denominations that would replace what were in practice systems of commodities (for example, cowries, MTTs, and gold coins such as sovereigns) and that would be more convenient (less heavy for large transactions) than a full-bodied silver-based money, and a desire to capture any possible seigniorage. Still, as we have also seen, the effort to replace the MTT frequently required the coercive power of the state.

There are two, not mutually exclusive, arguments for the durability of the MTT. Chown [1999] argues that Gresham's Law—bad money drives out good—applies only if a government succeeds in forcing its citizens to accept the "bad money" at an effective fiat value.²⁹ Where states were weak, merchants and citizens refused to use the "bad money" and enforced their preference for "good money". Gresham's Law aside, one can make a case that "better" money erodes the use of "good". The history of the conflict between bullion currencies suggests a market preference for coins that were harder to forge, contained more silver, and were of a higher purity, even though none of the coins in question traded on the basis of their face value [Andrew, 1904]. A second explanation for the durability of the MTT is that, given network externalities, it is difficult for a new standard to replace an established standard. The network externalities argument appears more persuasive because, as I have mentioned earlier, in several cases the MTT held off the challenge of equally full-bodied local coins.³⁰

The Concessionary Era (1914-1945) saw the plateauing of colonialism; Italy's invasion of Ethiopia and Japan's invasion of Manchuria and China were the last hurrah. In Ethiopia and the countries of the Arabian peninsula there were some attempts by independent governments to establish their own currencies, but little came of this. As far as the MTT was concerned, it neither gained nor lost appreciable ground.

The MTT's persistence may have been a consequence of several factors. The states where it still circulated were administratively weak. Nationalism was not well-advanced in the Red Sea and Gulf littorals where especially on the Arabian peninsula the states were feudal sheikdoms. Lastly, the governments lacked an economic incentive to pursue the issue given the small gains to be expected from seigniorage (see below).

It was the National Era (1945-1970s) that saw the complete demise of the monetary role for the MTT. By the mid-1970s, all the states of the Arabian Peninsula had introduced national currencies, leaving no country where the MTT would still have been legal tender.

Robinson [1964], in a remarkably prescient forecast, suggested that an International Era would emerge in the 1970s. He saw the period as one of a pendulum swing back from the intense nationalism of the previous era. As one manifestation of this we are seeing the renaissance of international monies.

However, the acceptability of fiat money outside the borders of the issuing state required the development of confidence in the stability of these currencies. Only recently with the U.S. dollar and now the euro have we solved Davanzati's problem. As Ritter [1995] points out, the transition from commodity to fiat money requires that the government be credibly able to promise to limit the issue of money. It has taken some time for U.S. Federal Reserve and the Bundesbank (and its offshoot — the European Central Bank) to earn the trust of non-citizens with respect both to monetary policy and convertibility.

It is not clear that the benefit of seigniorage to the governments concerned was ever a major factor in the decline of the MTT. Before the development of fiat money the gains would have been limited and so the influence minor. In time, as the public came to accept fiat money, the appropriation of seigniorage may have become a greater issue because the seigniorage to be gained was greater.

In the Middle Ages and for some time thereafter, absent debasements, seigniorage was probably not a major source of government revenue. Rolnick, Velde, and Weber point out that for France, for instance, "seigniorage was a negligible source of revenues during normal years, usually 5 percent or less" [1996, 796]. By the middle of the 19th century, the Vienna Mint was coining MTTs using customers' own silver for a brassage of only 1.5 percent. De Foville [1898, 12] lists "...the Mexican dollar, the thaler of Maria Theresa, the talari of Menelik, the French piaster used in Indo-China, the British dollar, etc." as examples of silver coins circulating in the world and trading on the basis of their bullion content. To this, one could add the Philippine peso, the Spanish 5 peso, and the U.S. trade dollar. As late as 1952, the charter for the Saudi Arabian Monetary Agency forbade the Agency to issue paper money [Edo, 1975a]. As he notes, "...the prohibition was made when full-bodied metallic coins were stan-

dard in most parts of the Peninsula, and government officials were uncertain whether the public was ready to accept a paper currency" [1975a, 10].

By the second half of the 20th century, many governments had solved the problem of creating confidence in fiat money that was more convenient to use than full-bodied money. That this money also yielded more seigniorage was an added benefit. Fischer's [1982] estimates show that by the late 20th century the value of seigniorage in developed Western economies was on the order of 1-5 percent of GNP. More recently, Click [1998] estimated the annual contribution of seigniorage for some 90 countries for the 1971-90 period. The low was 0.4 percent of annual GDP for New Zealand and the high was 15 percent for Israel. The median was at 1.6-1.7 percent for Malaysia and India. For Ethiopia, seigniorage was 2 percent of GDP. Click found no relationship between seigniorage and government spending.

CONCLUSION

The Maria Theresa thaler is a unique phenomenon for its combination of longevity and geographical spread. It succeeded and survived not because it changed but rather because it did not.

What gradually eroded demand for the MTT was the spread of the modern state with its national money. Over time states generally were able to induce their citizens to use the domestic currency, an inducement that rested on the states' success in learning how to create confidence in their own fiat monies, which on other grounds (such as cost of production and ease of use) were a better instrument. This process of the replacing of the MTT also rested in part on states' ability to enforce legal tender laws, which were probably critical in bringing about coordinated switches out of a well-established standard (the MTT) to a new standard (the domestic fiat currency). Until then, in many countries consumers used a coin "that bore the portrait of a 200-year-old monarch of a state that no longer existed and was of a denomination long superseded."

APPENDIX A

Description of the Maria Theresa Thaler

The coin has a diameter of 39.5 mm and is an alloy of silver and copper (833 1/3 Ag; 166 2/3 Cu). It weighs 28.0668 grams of which silver represents 23.3890 grams. In grains the amounts are 433 and 361. Among silver trade coins (for example, the Spanish-Mexican peso and the U.S. trade dollar), the Maria Theresa thaler has the lowest fineness except for the Spanish 5 peseta piece or the Philippine dollar of 1897 [Andrew, 1904].

The obverse of the Thaler has a portrait of the mature Empress. She wears a widow's veil (which was reduced in order to meet Arabian demands) and a brooch with nine pearls. The inscription "M. Theresa D.G.R. Imp. Hu. Bo. Reg." translates as: Maria Theresa, by the grace of God [Holy] Roman Empress, [and] Queen of Hungary and Bohemia. Below the bust one finds the initials "S." and "F." These stand for the names of the master and warden of the Günzburg mint in 1780, Tobias Schöbl and Joseph Faby.

The coin's reverse shows the imperial double-headed eagle with the arms of Austria at the center, surrounded by four quarters representing Hungary, Bohemia, Burgundy and Burgau (Günzburg). The inscription reads "Archid. Aust. Dux. Burg. Co. Tyr. 1780 X" and translates: Archduchess of Austria, Duchess of Burgundy, Countess of Tyrol, 1780.

The edge of the coin has the motto of the Empress "Iustitia et Clementia" (Justice and Clemency) interspersed with various ornaments in the form of leaves and rosettes. The raised lettering prevents clipping, or at least makes it more obvious.

APPENDIX B

Some Numismatic Details

There is some dispute over whether or not other mints produced the MTT but if they did the numbers were minuscule. There is also evidence for the production of some gold versions of the MTT.

Alessandrini [1969] and Pagani [1965] assert that the Mint in Florence started producing MTTs in 1814 and again in 1828 under Ferdinand III and Leopold II of Lorraine. Rossi [1999] repeats Leybold's [1975] position that the claim that Florence produced the thalers is highly unlikely and that there is no evidence of production; Leybold suggests that the coins attributed to Florence were probably minted in Milan. However, Broome [1984] makes a case based on his analysis of one particular variant of the MTT that the mint in Florence may have produced some coins for the Principality of Lucca and Piombino around 1814.

Zay [1892] reports that in 1788, Gaillard, Director of the Marseilles Mint, had acquired letters patent authorizing him to produce MTTs for the Levant. However, Broome [1984] reports that in a typescript for a second edition, Zay notes that Napoleon refused permission in 1802. Regoudy [1992] denies that Marseilles produced any MTTs.

Reports also exist that mints in Antwerp, St. Petersburg or Leningrad [Behrens, 1969] and Turkey produced the MTT but for these I have been unable to find sources that provide any supporting examples, dates or reports of quantities minted. Hans [1950] reports that the government of the U.S.S.R. denies any Russian production. Regoudy [1992] agrees that there is no evidence to support the claims for Antwerp and Leningrad.

Lastly, there is evidence of a gold version of the MTT. In 1926, the Hauptmünzamt in Vienna struck three for clients: two for customer "Asavay" and one for "Mr. Schwertfeger." One of these is in the British Museum (Inv. No. 1926-5-16-1). In a personal communication (5 September 2000), Dietmar Spranz, the Master of the Austrian Mint, reported that in 1936, the British made some gold MTTs. Apparently a Swiss company also made some for sale in the U.S.. These coins differ from the strikes produced in Vienna and the Austrian Mint considers them counterfeits. One was offered to the Mint in the 1990s but the Mint declined to purchase it. It is not clear which of all these pieces is the one Deacon [1944] describes.

NOTES

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1. Currently, Panama (1904), Ecuador (1999) and El Salvador (2000) have adopted the U.S. dollar as their currency. In the past, other countries too have used the U.S. dollar. These include Liberia (1944 to 1986) and Cuba (1899 to 1914). From 1914 to 1950 the U.S. dollar remained a parallel legal tender in Cuba.
2. Behrens [1969] states that 800 million were produced between 1780 and 1969, an assertion that Krause picks up. The number appears improbable, given the data that we have on the mints that surely produced most of the coins.
3. The silver itself came from mines in Bohemia and Tyrol. Prior to the discovery of silver in Peru, Bolivia and Mexico, the mint with the greatest output of large silver coins in the 16th century was that of Joachimsthal (St. Joachim's dale) in the Bohemian Erzgebirge. The word "dollar" is a corruption of "thaler", itself a shortened form of "Joachimsthaler." According to Andrew's [1904] estimates, Austria-Hungary accounted for about 38 percent of Europe's total production of silver between 1493 and 1900. However, all of Europe accounted for only about 9 percent of world silver production over that period, giving Austria-Hungary about 3 percent of the total.
4. For details on the changeover for the countries of the Peninsula see Edo [1975b]. For Ethiopia see Wasserman [1946].
5. A restrike retains the design of an earlier coin down to the original date. In all, numismatists have identified almost 30 variants of the MTT (primarily in small details of the design, especially the edge treatment) corresponding to the different mints.
6. The United States of the Ionian Islands was a British Protectorate from 1815 to its cession to Greece in 1864. The Greek name for political entity was *Ionios Koinopoliteia*; variant translations include Union or Confederation of the Ionian Islands or Isles.
7. Apparently the normal local practice was to loot shipwrecks, which occurred at a stable rate of 2-3 per annum, and to leave the survivors to perish, or even to kill them.
8. This translates into current U.S.\$420-525, after one converts MTTs to Egyptian pounds to sterling to current sterling to U.S. dollars.
9. Ofonagoro [1979] reports that local merchants had even arranged with Birmingham manufacturers to supply them with large quantities of counterfeits at bargain prices. Unfortunately I am unaware of any further details such as the firms involved or mintages.
10. Brassage is a fee for the cost of minting the coin.
11. Apparently the Eritreans referred to the *tallero* as the "bad" thaler and the MTT as the "good" taler. Curiously, one of the standard references gives the fineness of the *tallero* as 0.900. At 0.800, the actual fineness of the *tallero* was less than the 0.835 that was the standard for silver coins under the Latin Monetary Union of which Italy was a member, and which was the fineness of the Italian lira and the colonial 1 and 2 lira coins.
12. As Leavens [1939] shows, at the time the implicit price of the silver in the lira was U.S.\$1.332/oz. [0.999 fine] whereas the market price was about U.S.\$0.60 in New York. (For the silver in the lira to be worth one lira, the market price of silver would have had to have been U.S.\$1.332/oz fine (0.999). At this time, the implicit price of silver in the U.S. dollar was U.S.\$1.2929/oz fine.) This made the Italian coins an expensive source of silver relative to the MTT. Furthermore, five lira would yield a total of 20.875 grams of fine silver, whereas the *tallero* represented 22.5 grams of fine silver. Not surprisingly, the authorities would not accept lira in exchange for *talleri*. The MTT contained 23.3890 grams of fine silver; no one would offer an MTT for five lira or one *tallero*.
13. The Ethio-Italian Additional Convention (1889) had specified that Ethiopia would mint its money in Italy. However, Menelik II abrogated the Ethio-Italian Treaty of Wechale (1889) and chose Paris instead [Pankhurst, 1965].
14. With Austrian assistance the Ethiopians established a mint in the Imperial Palace in Addis Ababa but this produced only a limited number of the fractional coins [Pankhurst, 1965].
15. The denominations were 5, 10, 50, 100 and 500 thalers.
16. Bapterosses were porcelain pearls or beads that took their name from their inventor and manufacturer, Félix Bapterosses (1813-1885) of Briare in France.
17. At about the same time (1919-21), the UK went through three currency changes in East Africa. Essentially, the white settlers and the colonial authorities favored tying the currency issued by the new East Africa Currency Board to sterling, which was on the gold standard. However, the Indian trading community favored a link to the Indian rupee, which reflected their involvement in the trade of the Indian Ocean, and which trade was arguably more important than the white settler's limited agricultural export trade. Unfortunately, India was on the silver standard. The choice, therefore, had major distributional consequences for the wealth of the two communities. Ultimately, the EACB fixed to Sterling [Mwangi, 2000].
18. I would like to thank one of the referees of this *Journal* for this point.
19. Between August 1935 and March 1937, it produced at a rate of 900,000/month—13.7 million for the account of the Italian Treasury and 4.3 million for the account of the Governor of (Italian) East Africa. In fiscal 1937-38, the mint produced 0.5 million MTTs for the account of Banco di Roma, and in fiscal 1938-39, 0.5 million for the Treasury, and 0.2 million (plus) for both the Banco di Roma and the Banca d'Italia. I am indebted to Bernardi Giulio, the President of the Italian Numismatic Association, for the information on the Italian production. Unfortunately, annual figures for the period 1935 to 1937 are unavailable.
20. The mint shipped the MTTs to Aden except for the last 24 coins, which the mint sent directly to London as compensation for a weight difference. In 1956 the Banque de l'Indochine wished to place an order for 100,000 MTTs for their branch in Djibouti but the Belgian Mint did not respond to this demand. (Personal communication from Didier Vanoverbeek of the Brussels Mint).
21. Yule and Burnell [1903] define a banian (banyan) as "A Hindu trader, and especially of the Province of Guzerat, many of which class have for ages been settled in Arabian ports and known by this name; but the term is often applied by early travellers in Western India to persons of the Hindu religion generally. The word was adopted from Vaniya, a man of the trading caste (in Gujarati vaniyo), and that comes from Skt. vanij, 'a merchant.'" The earliest accounts of the Banyans in the Red Sea, the Gulf of Aden and the Horn of Africa date from the end of the 16th century; they survived well into the period of Italian colonialism as the region's ablest traders and moneylenders [Pankhurst, 1974].
22. South Africa continued to mint sovereigns until 1932. In 1952 it started producing a gold pound identical in all material respects (except design) to the sovereign. Great Britain itself resumed minting sovereigns in 1957.
23. Dietmar Spranz, Master of the Austrian Mint: private communication dated 5 September 2000.
24. In many countries custom, or Islamic law, holds that a woman's jewelry, whether dowry, earned from her own labors, or gift from her husband, remains entirely hers even in divorce. Among the Bedouin, a prospective bridegroom pays the bride's father a dowry, part of which the father uses to buy jewelry for his daughter as a wedding present. Any jewelry the bride receives as a nuptial settlement is her own property. This gives women an incentive to hold part of their wealth in the form of bullion minimally transformed into jewelry. Zhang and Chan [1999] interestingly argue that a dowry is a premortem bequest by altruistic parents for a daughter. It not only increases the wealth of the new conjugal household but also enhances the bargaining power of the bride in the allocation of output within that household, thereby safeguarding her welfare.
25. The existence of a state appears to be a sufficient but not necessary condition for the acceptability of fiat money. One of the astonishing phenomena of the Somali economy is the continued circulation of old Somali bank notes [Mubarak, 1995]. The central bank was destroyed and looted in 1991 and central government disappeared in the face of clan warfare so the question of the government's credibility became moot; these worn-out notes in dwindling supply apparently trade freely and maintain their value against foreign currency.
26. There is one account of private production around 1870 but Ofonagoro [1979] does not mention any cheating on the silver content. From the 18th to the 20th century, travelers report that their coins were subject to intense scrutiny and that locals would often reject coins for the slightest discrepancy from some implicit and not entirely consistent standard. There is also a report that one could interpret as the operation of an information cascade. Pankhurst [1963] passes on an account of coins being rejected for being too new. Wear may have functioned as an indicator that the coin had circulated and that others had seen and accepted it. However, too much wear would have reduced the silver content and eroded the fine details that signaled the use of high-quality production techniques.

27. For the Canadian case see Gilbert [1999].
28. See for instance Hewitt [1999] and Mwangi [2001].
29. Velde et al., [1999] have a more nuanced analysis of Gresham's Law and the conditions under which it is likely to persist. However, a key assumption in their model is that individuals cannot tell whether a coin is full weight or debased. In the case of the MTT versus possible supplantors, the difference is obvious.
30. For an interesting U.S. example of "good" fiat money driving out "better" fiat money see Caskey and St. Laurent [1994].

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