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**Nontraditional Monetary Policy Options:
Is Commodity-Based Stabilization Policy Worth
Another Look?**

Richard Burdekin

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CLAREMONT MCKENNA COLLEGE



500 East 9th Street
Claremont, CA 91711
Phone: (909) 607-3203
Fax: (909) 621-8249

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Richard C. K. Burdekin
Claremont McKenna College

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Abstract

The very low interest rates and inflation rates of recent years has generated renewed interest in alternative policies that would not leave central banks trapped by the zero lower bound on nominal interest rates. Amongst this debate, surprisingly little attention has been paid to the possibility of commodity purchases by the central bank, however. Commodity-based stabilization policy was widely advocated during the deflationary environment prior to World War II and has been put into practice in China and, to a more limited scale, in the United States in the form of the government's silver purchase programs and the more recent utilization of the Strategic Petroleum Reserve. This paper reviews these experiences and considers whether there is any useful scope for commodity-based stabilization today.

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Contact: Richard C. K. Burdekin, Jonathan B. Lovelace Professor of Economics, Claremont McKenna College, 500 E. Ninth Street, Claremont, California 91711.
Phone (909) 607-2884; Fax (909) 621-8249
E-mail: richard.burdekin@claremontmckenna.edu

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[U]nder a paper-money system, a determined government can always generate higher spending and hence positive inflation... To stimulate aggregate spending when short-term interest rates have reached zero, the Fed must expand the scale of its asset purchases or, possibly, expand the menu of assets that it buys.

(Federal Reserve Governor Ben S. Bernanke, November 21, 2002)

The Bush administration should replace the Saudis as the Fed of the oil market. The U.S. government should announce that we will start selling the Strategic Petroleum Reserve (SPR) with the intention of capping the price of crude at \$40 a barrel ...

(Yardeni, 2004, p. 3)

INTRODUCTION

The very low interest rates and inflation rates of the early twenty-first century have led some observers to draw incipient parallels with the apparent ineffectiveness of monetary policy during the deflationary environment of the 1930s (cf, Burdekin and Siklos, 2004). Much attention has also focused on ways in which monetary policymakers might circumvent the constraint imposed by the zero lower bound on nominal interest rates. Bernanke (2002), for example, discusses such “nontraditional” monetary policy options as buying longer-term government debt or even private or foreign debt.¹ Bernanke and Reinhart (2004, p. 89) emphasize the importance of introducing such policies before rates are cut to zero because of the risk that the public will “interpret a zero reading for the overnight rate as evidence that the central bank has ‘run out of ammunition.’” They worry that expectations of policy ineffectiveness could become self-fulfilling. Eggertsson and Woodford (2003) also point to the importance of managing expectations when interest rates are close to zero and argue that adopting a price level target is the best means to this end (see also Bernanke, 2003). The means of achieving any such price level target remains in question, however, as does the ability of the central bank to credibly commit to it. After all, it would imply enforced contractionary policy as soon as prices start to go up again. Other more radical options

for offsetting deflation include the levying a tax on money holdings to defeat the zero lower bound on interest rates – see Goodfriend (2000) and Buitert and Panigirtzoglou (2003).

Japan's experience with continued deflation despite the Bank of Japan's zero interest rate policy has become a particular *b.Ate noire*. For an inflation target to solve the problem, the Bank of Japan would have to find a way to inflate without relying upon the standard vehicle of cutting short-term interest rates. Svensson's (2001) case for inflating through currency depreciation under a temporary exchange rate peg is theoretically appealing, but at the same time seems dangerously reminiscent of the competitive devaluations of the 1930s. If the bottom line is a need to inflate, a more appropriate focus would seem to be reserve and monetary base expansion (Hetzel, 2003). But this still leaves open the question of the potential *modus operandi* for effectively restoring price stability in the presence of near-zero interest rates and deflationary pressures. The option of carrying out purchases of common stocks rather than the traditional government debt was put into practice by the Bank of Japan in September 2002. The Bank of Japan's purchases of stocks direct from banks may well have been motivated more as a means of supporting the country's weak banking system than as an anti-deflation device, however. As Schwartz (2003) observes, this policy also had the undesirable side-effect of disrupting the Japanese bond market. The Hong Kong Monetary Authority previously resorted to direct stock purchases in 1998 as part of their attempt to ward off speculation against the Hong Kong dollar during the Asian financial crisis that was spearheaded by the short selling of Hong Kong stocks by a group of prominent hedge funds (see Krugman, 1999; Jao, 2001). The intervention did succeed in maintaining the currency peg but may have been rather a pyrrhic victory, leaving Hong Kong with a currency that rose sharply against those of most of its Asian neighbors and contributed to its subsequent bout of deflation. Jao (2001, p. 205) concludes that, although the policy was "quite successful in protecting the integrity of the currency and the banking sector, a heavy price was paid, in terms of the worst recession in 40 years."

Before moving from stock purchases to any of the rather extreme suggestions laid out more recently, this paper argues that policymakers might reconsider an old idea: commodity-based stabilization

policy. Faced with very low interest rates and persistent deflation on a global scale during the Great Depression of the 1930s, economists laid out proposals for a “commodity reserve standard” and intervention that would pull commodity prices up from their depressed levels. Some proponents saw this as an alternative to the old gold standard but others saw intervention in commodity markets as simply a means of achieving the desired expansionary end – as in , say, the US silver purchase program that began under President Roosevelt. Although no formal commodity link for the national currency was ever adopted, either in the United States or elsewhere, intervention in commodity markets was an important part of both Nationalist and Communist stabilization policy during the Chinese Civil War. Meanwhile, the United States has embraced not just silver purchases but also the more recent issue of intervention in the oil market via the Strategic Petroleum Reserve. In this paper these experiences are re-examined in conjunction with a range of proposals for commodity-based stabilization both old and new.

Commodity-based stabilization’s disappearance from the radar screen today is exemplified by the recent survey by Yates (2004) of proposals for achieving monetary effectiveness in the presence of very low interest rates: although all the other proposals noted above are covered in the otherwise exhaustive survey piece, commodity markets receive not a single mention. The recent concern with rising oil prices suggests that commodity prices certainly have not been rendered irrelevant in the face of the recent trend towards a more service-based economy, however. Although the US economy in the twenty-first century may well be less exposed to oil price hikes than was the case in the 1970s, the potential negative effects of high oil prices remain significant (see Jones, Leiby and Paik, 2004, and the references cited therein) and “the risk of more serious negative consequences would intensify if oil prices were to move substantially higher” (Greenspan, 2004). Commodity price fluctuations may also be more than just a source of inflationary or deflationary pressures. Barsky and Kilian (2002, 2004) argue that oil prices, in particular, have typically more reflected macroeconomic trends than supply-side conditions since 1970 – and that the key impetus behind not only US inflation performance but also oil price trends in the 1970s was the combination of monetary ease and dollar weakness.

Commodity-based stabilization is itself only intervention in a different market from the government bonds that we are used to seeing central banks buy and sell in gigantic quantities. Are government securities fair game and everything else off limits? This certainly was not the conventional wisdom in the past. Nor have open market purchases and sales of government debt always been the mainstay of US monetary policy. When large-scale open market operations were initiated by the Federal Reserve in 1932, this policy was viewed as an “extraordinary” break from conventional practice:

Never before has a purchasing campaign been carried on intensely after member bank indebtedness to the Reserve System had been largely liquidated. Never before have the free reserve balances of member banks been deliberately piled up, apparently with the object of tempting them into extending more credit.

(Dolley, 1933, p. 518)

If the ultimate goal is overall price stability, targeting the price of government securities, or their counterpart interest rate, is certainly one means to that end if the target is adjusted correctly in the face of inflationary or deflationary pressures. Past experience makes clear that it is not the *only* means to that end, however. Targeting commodity prices could allow an immediate escape from the zero lower bound on interest rates, as well as potentially yielding a target correlated with the general price level. In this way, a commodity standard may be viewed as a means of achieving an inflation or price-level target – or, at the very least, as a complementary objective.

AN ALTERNATIVE COMMODITY-BASED STANDARD?

The principle of governments buying and selling surplus stocks to maintain supplies and stabilize prices (and avert famine) is very old indeed and can even be found in the Old Testament:

[F]or the next seven years there were bumper crops everywhere. During those years, Joseph took a portion of the crops grown in Egypt and stored them in nearby cities... At last the seven years of plenty came to an end... There were crop failures in all the surrounding countries, too, but in Egypt there was plenty of gain in the storehouses... So with severe famine everywhere in the land, Joseph opened up the storehouses and sold grain to the Egyptians.

(Bible Gateway, 1996: *Genesis 41*)

This practice was also endorsed by Confucius in China during the sixth century B.C, and stabilization of grain prices became an important part of early Imperial Chinese policy. In 54 B.C. Kang Shou-ch'ang formally

proposed that all the provinces along the boundary of the empire should establish granaries. When the price of grain was low, they should buy it at the normal price, higher than the market price ... When the price was high, they should sell it at the normal price, lower than the market price ...

(Chen Huan-Chang, 1911, p. 572)

The practice of releasing supplies of a key commodity onto the market at times of rising prices was subsequently embraced as a major part of the Communists' anti-inflation policy during and after the Chinese Civil War as discussed in the next section of this paper. On a smaller scale, President Bill Clinton employed a portion of the United States' Strategic Petroleum Reserve (SPR) in a similar fashion in 1996, ordering the sale of a portion of these reserves in an attempt to combat rapidly rising gasoline prices. Blumstein and Komor (1996, p. 274) embrace this kind of intervention as a regular strategy:

Price controls and crude oil allocations have been tried and found wanting. A better alternative is for the government to participate in the oil market in much the same way that the Federal Reserve participates in the market for government securities.²

The use of the SPR in a similar fashion in the face of the 2004 run-up in oil prices was the subject of much debate (see, for example, Yardeni, 2004) but pressures for intervention were generally resisted by the Bush administration at that time. Interestingly, though, in the same year China began development of its own strategic oil reserve – with its oil reserve base in Zhenhai (the first of four planned installations) scheduled for completion in 2005 (*People's Daily Online*, October 10, 2004).

Commodity-price-based stabilization policy, in fact, received widespread support in the first half of the twentieth century as an alternative to a precious metal standard. Laughlin (1901, pp. xi-xii), for example, concluded that the objective of “a less changeable standard for paying long term contracts” could best be achieved “by creating a legal unit of payment derived from the prices of a sufficient number of staple articles.” An adjustable commodity-based dollar was formally laid out by Fisher (1920), who

suggested adjustments in the number of resource units in the dollar to achieve price stability. If prices fell below target by 1%, for example, the dollar value of the resource unit would be raised by 1% – at the same time automatically lowering the number of resource units in the dollar. In 1923 Fisher began publishing a weekly index of wholesale prices to draw public attention to the fluctuations in the dollar's purchasing power (Fisher, 1934, pp. 384-385) – at the same time perhaps illustrating the desirability of adopting a scheme to offset such fluctuations. The hypothetical gains from an historical implementation of Fisher's compensated dollar are demonstrated by Bordo, Dittmar and Gavin (2003), who find significant reductions in price level and inflation uncertainty compared to the gold standard.

Meanwhile, Hall (1982) shows that a particular mix of ammonium nitrate, copper, aluminium and plywood would have closely tracked the overall US cost of living over the 1946-1980 period. Under the proposed stabilization scheme, the government would settle for no more than defining, and adjusting, the dollar's value in terms of the selected commodity units – and Hall (1982) actually advocates prohibiting any direct government intervention in the commodity markets. Lewis (1925) previously suggested an alternative set of representative key commodities, including silver alongside wheat, cotton and iron, with currency to be convertible into warrants to buy pre-specified amounts of these commodities. From an early date, doubts have been raised, however, about whether the range of suitable commodities would be wide enough to be representative of the commodity price level as a whole and whether, “if over-production were general, it would leave other goods to decline in price” (Clark, 1933, p. 82). Moreover, while Lewis (1925), like Hall (1982), argued that government warehousing of the commodities in question would not be necessary, commodity-based proposals have more often been based upon government stocks and direct government intervention in commodity markets. Graham (1937) and Keynes (1938) both favored the use of government stocks, for example. Keynes (1938, p. 454) also pointed to an “experimental purchase by the Bank of Sweden of certain stocks of commodities as a form of central banking reserves alternative to gold, a policy which could be a means, if widely pursued, of flattening out the fluctuations in prices.”

Graham (1941) proposed that a commodity reserve currency be established with Federal Reserve banks buying warehouse receipts for the chosen commodity units so as to “redeem their liabilities, on demand, in commodity units or gold at the option of the holder.” Free convertibility into a range of basic commodities was endorsed by Lester (1939, pp. 302-303), who argues that “[s]ubstitution of a goods standard for the gold standard would tend to make our basic industries react more as the gold industry does during a business decline.” The premise that a commodity reserve currency could be adopted as an alternative to the old gold standard received serious consideration in the 1930s and 1940s. Einzig (1936) stressed the infeasibility of Britain acquiring enough gold to restore parity with the French and US gold reserves and advocated commodity reserve backing for the pound. Einzig (1936, p. 207) also noted the scope for allowing foreign debtor countries to pay their debts in the form of commodities under this arrangement and referred to the example of Hungary settling her debt to Switzerland in the form of a special wheat export. Meanwhile, Hayek (1943, p. 183) praised the automaticity of Graham’s proposed commodity reserve currency under which “the business of the monetary authority would be as mechanical as the buying and selling of gold under the gold standard.”

During the discussions that set up the International Monetary Fund, it was proposed that buffer stocks of raw materials be incorporated in the new international monetary system (see Graham, 1944). Critiques pointed, however, to the practicality and cost of the proposed commodity market interventions as well as questioning whether the scheme could really give rise to the kinds of automatic adjustments seen under the gold standard (see, for example, Beale, Kennedy and Winn, 1942). In an exhaustive review of Graham’s proposal, Bennett and associates (1949) question whether the stabilization gains would be sufficient to outweigh the costs of implementation. Finally, Friedman (1951) emphasizes the relatively narrow range of suitable, standardized commodities as well as high elasticity of supply that would lead to large output responses to price changes, thereby forcing commensurately large fluctuations in the stock of money under the commodity reserve currency scheme. Friedman (1951, p. 232) concludes that in

seeking to gain the countercyclical advantages of a fiat standard while retaining the physical base of the gold standard, commodity-reserve currency seems .. to fall between two stools and, like so many compromises, to be worse than either extreme. It cannot match the nonrational, emotional appeal of the gold standard, on the one hand, or the technical efficiency of the fiat currency, on the other.

As a basis for an international monetary standard, the criticisms may well have merit. But could more limited applications of the idea of commodity-backing still make sense? There are certainly examples of governments undertaking commodity-based loans, dating back at least to the Confederacy's cotton-backed bonds of 1863 (see, for example, Brown and Burdekin, 2000). Another case is Hungary's 1944 wheat loan that linked payments of both capital and interest to the price of wheat (Graham, 1944, p. 118). Nor is settling debts in commodity terms a relic of the past, as Iraq's recent "oil for food program" attests. Finally, while not a deliberate policy, a clear link between the strength of the national currency and the value of the primary export commodity is evident in Russia and many oil-producing nations within OPEC (Frankel, 2003a,b; Gavrilencov, 2004). Another instance of an important commodity linkage is the Chilean peso vs. world copper prices (Frankel and Saiki, 2002; Spilimbergo, 2002). Frankel (2002, 2003a) and Frankel and Saiki (2002) suggest that policymakers in such commodity-dependent nations should embrace this link by deliberately tying monetary policy to the nation's primary commodity price. That is, stimulate monetary expansion whenever the nation is faced by declining demand for the commodity (or commodities) in question. An alternative compromise, suggested by Frankel (2003b, p. 57) for the specific case of Iraq, would be to at least add oil to a currency basket and

define the value of the dinar as one-third of a U.S. dollar plus one-third of a euro, plus one-one-hundredth of a barrel of oil. Unlike other proposals for nominal anchors, this is one that an oil producer like Iraq could live with even if there are big swings in international exchange rates or world oil prices in the future.

Under the pure commodity peg, oil producers would simply tie their monetary policy to the oil price, expanding when oil prices fall and contracting when oil prices rise. Such a strategy is often seen to work well in Frankel and Saiki's simulations and has strong intuitive appeal given that it is almost inevitable that an oil-dependent country will face deflationary pressures if oil prices plunge and

inflationary pressures if oil prices surge upwards. Similarly, gold-dependent economies would tie their monetary policy to the gold price but, unlike the typical experience under the old gold standard, gold could actually be expected to be a good proxy for overall price pressures in such a gold-driven economy. Even larger economies could benefit from this strategy, at least in comparison to the more popular alternative of pegging to the US dollar. For example, Frankel (2002, p. 6) notes that, had Argentina adopted a wheat-peg rather than a dollar-peg during 1991-2001, the Argentinean peso would have depreciated rather than appreciated as it did over the latter part of this period. The dollar peg was deflationary just as the gold peg was deflationary for the United States and many other countries in the late nineteenth century and during the Great Depression – and the authorities in each case ended up maintaining a fixed single-asset price while as almost other prices declined. Thus just as Lester (1939) argued the merits of stabilizing commodity prices over the old gold standard, Frankel's work points to the potential gains for smaller, commodity-exporting economies pegging the domestic currency price of that commodity rather than tying their currencies to the dollar or other foreign currency. As with Graham's earlier proposal, the objective is to achieve automatic expansion when market conditions weaken.

BIMETALLISM AND THE US SILVER PURCHASE PROGRAMS

The option of basing policy decisions, or even the monetary unit itself, on a composite commodity standard shares some of the arguments made for a bimetallic standard rather than a pure gold or pure silver standard. In the bimetallic case, stabilizing effects derive from the increased minting of the cheaper metal if shifts in demand and supply cause the other to appreciate (see, for example, Dowd, 1996). In the late nineteenth century, for example, relative scarcity of gold caused its command over goods and services to rise. Under the gold standard this required goods prices to fall and the resulting deflation led, in the United States, to considerable hardship in the agrarian sector and calls for a return to the free coinage of silver that had been the rule prior to the Civil War. Had the bimetallic standard not been removed under the 1873 Act, increased minting of silver likely would have significantly reduced,

perhaps even eliminated, the deflationary trend of the 1880s and 1890s (see, for example, Drake, 1985; Friedman, 1992; Velde, 2002). This automatic expansionary response would have occurred as silver market price fell below its mint value based upon the old 16:1 ratio against gold. Calls for this restoration of bimetallism persisted until deflationary pressures were alleviated by new gold production near the end of the century, with the final defeat of this movement usually tied to the lost presidential campaign of William Jennings Bryan in 1896.

A perennial criticism of bimetallism remains the problem that, unless these relative market values remain very close to the ratios laid down by the mint, it will not be possible for both metals to be widely in use at the same time, however (see, for example, Laughlin, 1901; Redish, 2000). In any event, while agitation for silver never did lead to the restoration of a bimetallic standard, it did spur the adoption of a series of major silver purchase programs in the United States. With silver never being a key US commodity export, such a singular focus on silver could not be optimal unless silver were highly correlated with the overall level of commodity prices. On the other hand, this could still offer an improvement over the gold standard so long as silver was at least a better proxy than gold. This was almost certainly the case in the years after 1873. But the first major silver purchase program adopted in 1890 was doomed to failure because, with the US dollar still held tied to gold, any monetary expansion could hardly fail to trigger offsetting gold outflows and/or pressure for dollar depreciation that would require either a reversal of the expansion or a devaluation of the currency. The Sherman Act of July 1890 called for a doubling of the limited silver purchases under the old Bland-Allison Act of 1878, using the new Treasury notes of 1890. These were legal tender notes convertible into either gold or silver. Total silver purchases were 168.7 million ounces of silver at an average cost of \$0.9244 per ounce (see Table 1).

The Sherman Act's incompatibility with the gold standard frustrated its intended expansionary effects, however (Roper and Wagner, 1991). The new notes issued in exchange for the silver ended up losing 30% of their backing because the price of silver fell after purchases began, dropping to \$0.65 per

ounce by 1896 (Laughlin, 1901, p. 260). Meanwhile, inflation fears and external shocks like the Barings crisis helped trigger an outflow of gold and decline in gold certificates while “the banks strove to get rid of their silver; ceased to pay in gold to the Treasury ... for duties; and silver streamed into the Treasury” (Laughlin, 1901, p. 261). According to Taussig (1892, p. 59) “the decline in the Treasury’s gold receipts was the certain proof of a redundant issue of silver.” Much of the intended expansionary effects of the silver purchases were thereby offset – although some modest overall money growth was achieved in the period leading up to repeal of the silver purchases in September 1893 (see Table 2). On August 26, 1893, Congressman Bourke Cockran summed up the experience as follows:

I think it safe to assert that every commercial crisis can be traced to an unnecessary inflation of the currency, or to an improvident expansion of credit. The operation of the Sherman Law has been to flood this country with paper money without providing any method whatever for its redemption. The circulating medium has become so redundant that the channels of commerce have overflowed and gold has been expelled.³

The failure of silver purchase program was reflected in widespread gold hoarding and increased exchange rate and inflation uncertainty. The program was finally repealed in 1893 in the face of growing gold outflows. Suspension risk fueled rising nominal interest rates (Calomiris, 1994) and Hallwood, MacDonald and Marsh (2000) also link the passage of the Sherman Act in July 1890 to an immediate, and significant, shift in expectations of dollar devaluation. The gold drain was exacerbated by the Baring failure in Europe (Taussig, 1892). The gold outflow ended up offsetting most of the expansionary effects hoped for by the silverites (Friedman and Schwartz, 1963; Timberlake, 1978). Actual devaluation may have been staved off, in part, because of a tightening of bank credit in the face of the bank runs in mid-1893 that encouraged domestic hoarding and helped reverse the gold outflow (Miller, 1996). Miller (1996, p. 639) adds that additional restrictions on cash payments were imposed by the banks from August 3-September 2, leading to a premium on gold and currency that “was not expected to last very long ... [and] gave way to a dramatic inflow of ... more than \$40 million in gold” in just four weeks.

Despite the problems with the silver purchase policies of the 1890s, large silver purchases were again authorized under the Silver Purchase Act of June 1934 as part of President Roosevelt’s New Deal

policies. The constraint of the gold standard was removed first in this case, however. Prior to going off gold in 1933, the US government pursued attempts at securing an international agreement that might make bimetallism a feasible option (Froman, 1936; Timberlake, 1978). But attempts at international agreement failed and in the end the silver purchase act was little more than a convenient vehicle for securing political support for the expansionary monetary policy desired by FDR (Frohman, 1936; Brattner (1938a,b) Frohman, 1936; Friedman, 1992). Some net expansionary effect likely remained even after taking account of reduced gold purchases after the silver program was adopted (Friedman and Schwartz, 1963). Bernanke (2003) credits the accompanying 40% devaluation of the dollar against gold in 1933-1934 as a key policy shift that permitted sufficient monetary expansion to reverse the deflation and also argues that this “episode illustrates that monetary actions can have powerful effects on the economy, even when the nominal interest rate is at or near zero, as was the case at the time of Roosevelt’s devaluation” (Bernanke, 2003, p. 7).

Large gold purchases had begun in October 1933 and the aim of the government’s “gold policy was to raise the price level of commodities, particularly farm products and raw materials, which sustained the greatest relative decline during the preceding years of deflation” (Friedman and Schwartz, 1963, p. 465). The overall US money supply rose by 9.5% from June 1933 to June 1934 and 14% and 13% over the next two fiscal years (Friedman and Schwartz, 1963, p. 544). Although the primary driver for this was the expansion in Federal Reserve notes, silver rose from less than 12% of total US currency in 1932-33 to nearly 25% of total currency in 1938 – see Table 3. (Despite the pace of purchases declining after that point, the silver purchase acts were not finally repealed until June 1963.)

The silver purchases were, naturally, of disproportional importance to domestic silver producers and western silver producing states, both of whom benefitted greatly (Friedman, 1992). There were severe deflationary consequences for other countries with high levels of silver coinage (like Mexico) or countries still on a silver standard (including China and India), however. China, in particular, faced severe deflationary pressures as its exports became more and more expensive abroad (Friedman, 1992).

After the world silver price rose with the US purchases, China's Nationalist government on November 4, 1935 introduced a new national currency, the fapi. The fapi replaced the silver yuan except in Manchuria and Taiwan – which were under Japanese control until August 1945 and November 1945, respectively² – and it subsequently suffered 1700 fold depreciation over the eight years of the 1937-1945 Sino-Japanese War.

CHINA'S EXPERIENCE WITH COMMODITY-BASED STABILIZATION POLICY⁴

As early as 1938, China's Nationalist government began to purchase and re-sell commodities at below-market prices as an anti-inflationary measure (Hsia, 1953, p. 21). However, in order to get supplies of the commodities on the market, the official prices had to be progressively increased so that the inflationary pressure was more accommodated than suppressed. A more stringent program of price freezes and rationing was introduced on January 15, 1943. At the same time, the Nationalist government tightened its supply control over the production and distribution of such key commodities as cotton, rice and wheat--supplementing the collection of land taxes-in-kind that began in late 1941. Hsia (1953, p. 22) points out, however, that upward revisions of the ceiling prices were still needed to keep commodities flowing from the countryside (where there was little or no enforcement of the price controls) to the cities (where the ceiling prices were more rigorously adhered to). Price controls were imposed as part of the August 19, 1948 monetary reform. But even drastic enforcement of the price controls in Shanghai under Chiang Kai-shek's son, General Chiang Ching-kuo, failed. On November 1, 1948 Chiang Ching-kuo resigned after "the refusal of producers to send stocks of foodstuffs into Shanghai created an emergency food shortage, the artificial controls gave way to pent-up economic pressures and the tempo of economic deterioration reached an unprecedented rate" (US Department of State, 1949, p. 278). The Nationalist government soon collapsed in the midst of rampant budget deficits, inflation and military defeat and their remaining forces fled to Taiwan during 1949-1950.

Even with the Communist forces' successes on the battlefield, their renminbi currency (which in Chinese means literally the "people's currency") also depreciated rapidly in 1949. Communist issues of renminbi increased from 19 billion in December 1948 to 280 billion in July 1949 and 810 billion in September 1949 (see Table 4). These note issues were needed to finance the continued large military expenditures, and in the Huabei area (encompassing Beijing and Tianjing) 69.5% of total expenditures in April 1949 were funded by the budget deficit (Hsüeh, 1986, p. 28). The Communist authorities, like the Nationalists before them, responded to the resultant inflationary pressures by direct intervention in commodity markets. State trading units were established, obtaining their supplies through the tax-in-kind, from the output of state enterprises, and by purchase of private sector output. Up until March 1950 the regional state trading companies operated independently, but local state trading companies reacted on a large scale to the April price jump in Beijing and Tianjing by concentrating their supplies of grain, cotton yarn and other essential commodities. Between April 23 and April 31, the state trading companies sold 4.9 million kilograms of grain in Beijing and another 37.4 million kilograms in Tianjing. In April, the maximum daily supply of grain by the state trading companies was 2.5 times higher than the normal volume of market supply in the two cities (Pien Hsieh Tsu, 1986, pp. 78-79). Following this intervention, the authorities moved to strengthen the power of the state trading companies and to set up a specialized trading unit to handle each of the key commodities. State trading companies also extended their activities into the retail sector so that they could deal directly with the public (Pien Hsieh Tsu, 1986, pp. 80-81).

The government's commodity price focus also extended to the banking sector. Under the "parity deposit system" introduced by the People's Bank of China on April 20, 1949, the value of deposits was set in terms of a commodity unit that conformed to the consumption pattern of the local population. This essentially indexed deposits to commodity prices. Accounts in foreign currencies were also permitted, so long as the foreign currency was converted into renminbi at the time of withdrawal. This parity deposit system was accompanied by quite substantial growth in the volume of bank deposits in Tianjing--where the volume of bank deposits rose more than 20-fold between March 1949 and June 1949 (Pien Hsieh Tsu,

1986, p. 81). On June 14, 1949 this parity deposit system was extended to Shanghai. Even though the volume of Shanghai bank deposits remained extremely low in absolute terms (in October 1949 deposits in Shanghai banks stood at less than 5% of the 1937 level), bank deposits did at least more than keep pace with commodity prices between July and October 1949 (see Hsia, 1953, p. 61). This may have helped to lay the groundwork for the more substantial reduction of cash in circulation that was achieved under the March 1950 stabilization measures.⁵

The first nation-wide intervention by the state trading companies took place in November 1949. By this time, the state trading companies controlled approximately 70% of the nation's supply of coal, 30% of cotton yarn, 50% of cotton cloth, 66% of salt and 33% of grain (Ma and Kao, 1990, p. 20). The trading units could also now jointly allocate and transport nationwide as much as 2.5 billion kilograms of grain (Hsüeh, 1986, p. 32). In an attempt to bring down prices and withdraw currency from circulation, the state trading companies unloaded commodity stocks in the big cities. Between November 1 and November 8, 1949, 13.6 million kilograms of grain were put on the market in Beijing and, on November 7, grain equivalent to 10 times the normal daily trading volume was put on the market in Shanghai (Pien Hsieh Tsu, 1986, p. 107). Sales by the state trading companies withdrew as much as 30 billion renminbi from circulation in Shanghai between October 10 and November 10 (Shang-hai Sh' Hui K'o Hsüeh Yüan: Ching Chi Yen Chia So, 1958, p. 362). A further 12.5 million renminbi were drawn out of circulation in Beijing and Tianjing in November, which amounted to 13.63% of the total local money issue as of the end of October 1949 (Pien Hsieh Tsu, 1986, p. 107).

Unlike the experience under the previous two inflation spikes, the state trading companies were now able to establish price leadership in the key commodity groups (Hsüeh, 1986, p. 34; Pien Hsieh Tsu, 1986, p. 110). The commodity price stabilization policy involved not only selling commodities whose price had gone up but also entailed purchasing commodities whose price had gone down--as applied to cotton yarn, cotton cloth and grain in Shanghai, Tianjing, Hankou and Xian in late 1949 (Pien Hsieh Tsu, 1986, p. 109). On December 15, 1949 the state trading companies in Shanghai and Tianjing raised their

prices on cotton yarn because the market price had fallen below the floor price laid down by the Central Committee in Shanghai (Pien Hsieh Tsu, 1986, p. 110). The growing effectiveness of the state trading agencies was demonstrated in the action taken to counteract the soaring price of cotton yarn in Beijing in November 1949. After mobilizing its supply of cotton yarn, the state trading company put it on the market at the end of the month and brought the price of cotton yarn in Beijing down from 5.2 million renminbi per hank to 3.8 million in just a few days.

Other measures aimed at combating the November 1949 price jump included new efforts at increasing tax collection by cracking down on tax evasion and fraud. By December, tax collections in Shanghai stood at nearly double the September amount while December tax collections in Tianjing were more than five times higher than in September. There were also efforts to tighten money circulation by postponing expenses and freezing and recalling bank loans. Bank deposits continued to grow rapidly under the parity deposit scheme (Table 5). The total currency issue in February of 4,100 billion renminbi was still 2.05 times higher than the November 1949 total, however (Hsüeh, 1986, p. 35). Meanwhile, the state trading companies' price stabilization efforts were buttressed by the growing establishment of state retail stores during 1950, following a shift in emphasis from wholesale to retail prices in the previous year.⁶ Faced with another big price jump in February 1950, the state trading companies supplied large quantities of grain and cotton cloth in the big cities. The trading companies also sought to equilibrate relative prices of commodities over the different regions and to encourage retail trade by widening the spread between retail and wholesale prices (Pien Hsieh Tsu, 1986, pp. 96-100).

Surprisingly, the authorities succeeded in stabilizing prices despite the fact that the budget deficit remained at 40% of total expenditures through the second quarter of 1950--pending the substantial reduction in the deficit to 9.8% of expenditures in the third quarter (Jung, 1951, p. 1355; Ma and Kao, 1990, p. 21). Prices begin to decline in March 1950 and the exchange value of the currency stabilized. Compulsory subscriptions to the government's Victory Bonds issues may have played a role in the price decline. The "Decision on the Unification of State Financial and Economic Work" that was passed on

March 3, 1950 was probably key, however. Besides providing for a unified government budget, this directive required that "cash funds of all military and political organs and of state enterprises, excepting a specified amount to be reserved for immediate expenditure, must be deposited in the state banks" (see Hsia, 1953, pp. 63-64). The decline in the velocity of money at this time is reflected in the falling turnover rate for deposits at private banks in Shanghai. The turnover rate fell from 52 during 1949, to 12 during March 1950, and to 4 in the first half of April (Hsin, 1954, p. 25). Meanwhile, the total volume of deposits in Shanghai banks and banking offices rose by 158% between January and April 1950 (Ling and Lei, 1959, p. 65). The March 3 directive also provided for centralized revenue collection, and required that tax receipts, profits from state enterprises and warehouse stocks were all to be directly transmitted to the central government (Ch'en, 1984, pp. 65-70). Following the fiscal reforms, the budget deficit declined to 6.4% of expenditures by the fourth quarter of 1950 according to Jung Tzu-ho, the Vice-Minister of Finance (Jung, 1951, p. 1355). For the year as a whole, Jung estimated that the budget deficit was constrained to 16.7% of total expenditures (as compared to the 18.7% figure laid down in the original draft budget--Table 6).

On April 7, 1950, the People's Bank of China was put in charge of administering the cash control program announced as part of the March unification measures. All inter-unit payments were now to be cleared through the People's Bank and deposits in private banks and lending to the private sector were forbidden (Hsia, 1953, pp. 64-65; Ch'en, 1984, pp. 67, 71). The April 7 directive was followed by a sharp increase in bank deposits and the volume of deposits at the People's Bank, for example, increased from 428.3 billion renminbi at the end of March to 1,089.6 billion at the end of April (see Hsia, 1953, p. 64). But the reduced currency in circulation soon led to problems with deflation. Currency in circulation as a ratio of total bank deposits fell from 166.6% in March 1950 to 33.3% in May 1950 (Hsia, 1953, p. 65) and the overall money supply declined to approximately 4,000 billion renminbi on May 5, 1950 (Ch'en, 1984, p. 85) from 4,100 billion on February 28, 1950 (see Table 4). In the face of this monetary contraction, general wholesale price indices calculated for six districts and seven major cities declined by

30.8% and 21.3%, respectively, between March 1950 and May 1950 (Pien Hsieh Tsu, 1986, p. 119). Meanwhile Shanghai wholesale prices fell by 16.6% in April and by 3.4% in May (Shang-hai ShA Hui K'o Hsüeh Yüan: Ching Chi Yen Chia So, 1958, pp. 376-377). The price declines were accompanied by a business slump as "consumers were sure of a further decline in price and refrained from buying any more at least for the time being" (Hsin, 1954, p. 4). Shanghai alone saw the closure of more than 6000 businesses March and May 1950 (Shang-hai ShA Hui K'o Hsüeh Yüan: Ching Chi Yen Chia So, 1958, pp. 376-377). Prices even fell below the level of production costs, with the April 1950 market price of cotton yarn in Shanghai, for example, being 9.1% below costs (Pien Hsieh Tsu, 1986, p. 123).

The state trading units responded to the deflation by allowing their quoted price to rise above the prices offered by private businesses (Hsin, 1954, pp. 26-27). In Shanghai, for example, the market price of cotton yarn on May 24, 1950 was 15% below the price quoted by the state trading company (Pien Hsieh Tsu, 1986, p. 120). The state enterprises were instructed to make further efforts to boost commodity and agrarian prices rise after the May 25 meeting of Deputies of Industry and Commerce. The Shanghai state trading company raised its offer price for cotton yarn by 17% and extended contracts to purchase 35% of total private cotton yarn production (Shang-hai ShA Hui K'o Hsüeh Yüan: Ching Chi Yen Chia So, 1958, pp. 378-379). Furthermore, loans and deferred taxes were provided to private enterprises as a means of boosting economic activity. State enterprises also now gave contracts to the private sector and provided free materials to certain textile, rubber, paper and machine-tool producers.

A renewed round of deflation set in during the winter of 1951-1952, however, following the end of the Korean war. Shanghai wholesale prices fell by 6.7% between December 1951 and May 1952 while wholesale prices for an index of the seven biggest cities fell by 4.9% over this same period (Pien Hsieh Tsu, 1986, p. 220). This was partly driven by the government's own "Three-anti Movement" of December 1951 that targeted alleged waste, inefficiency and corruption within the government agencies, and levied substantial fines on the state trading companies. In some areas, the state trading companies

ceased purchasing entirely in the first half of 1952. Another “Five-anti Movement” targeted private businesses and levied heavy fines – with total fines from the two movements accounting for as much as 43,971.1 billion renminbi in the 1952 fiscal budget, or approximately US\$1.7 billion (Hsin, 1954, pp. 39-40). There was a widespread business slump, and in Guangzhou, for example, retail sales in the second quarter of 1952 were 38.44% below the second quarter of 1951 (Pien Hsieh Tsu, 1986, 220). From June 1952, a series of price initiatives were introduced to reflate the weak economy. As with the earlier measures undertaken in May 1950, the state trading companies were instructed to increase purchases from the private sector and promote sales. In November 1952, further price initiatives enlarged the price differential between wholesale and retail prices and required the state trading companies to close some of their branches and give some of their retail business to the private sector (Pien Hsieh Tsu, 1986, p. 229).

CONCLUSIONS

Coincidentally, discussion of a formal commodity-based monetary standard in the west peaked during the 1940s around the same time that China’s commodity-based stabilization policy was being applied. Proponents sought a way to reverse the generalized price declines of the 1930s and also, in many cases, to restore the automaticity of the old gold standard. In comparison to gold, a commodity standard would almost inevitably be better tied to the overall price level but, at the same time, more difficult (critics would say impossible) to administer. This does not mean that commodity-based stabilization is of no relevance today, however. Not only did selling stocks of key commodities in the market certainly seem to have been an important, and seemingly-effective, component of Communist anti-inflation policy in 1949-1950 but also purchases by the same state trading companies helped alleviate subsequent deflation in 1950 and 1952. Commodity purchases or sales could also be a useful vehicle for achieving needed monetary expansion or contraction in other cases, as evidenced, for example, by the US silver purchase program in the 1930s. As silver prices fell with the aggregate price level, supporting silver and abandoning gold unquestionably moved monetary policy in the right direction – a direction that may well

also have unfolded automatically under a bimetallic standard in line with the counterfactual evidence on the earlier late nineteenth century deflation. There is certainly no reason that central banks must buy and sell only financial assets. And, if one moves beyond government bonds because of concerns about the zero lower bound on interest rates, it is not clear that purchases of common stocks is any way less manipulative than buying and selling commodities.

Besides the potential use of commodity market intervention as a *modus operandi* for monetary expansion or contraction, the other question is the appropriate target for monetary policy. A broadly-enough defined commodity basket would be an almost perfect target, as suggested by Fisher (1920) and demonstrated empirically by Bordo, Dittmar and Gavin (2003). But practical implementation remains a problem. A single commodity price target would, on the other hand, be more feasible but desirable only to the extent that this single commodity price was well correlated with the aggregate price level. Frankel (2002, 2003a) and Frankel and Saiki (2002) suggest that these conditions apply for small, resource-dependent economies and advocate pegging the currency to the price of the nation's primary export commodity. Although not a perfect policy prescription, the authors' policy simulations suggest it is a potentially promising approach and, almost always, better than the more widespread practice of tying the domestic currency to a foreign currency unit like the US dollar. Even in larger economies, a temporary commodity-price peg could potentially be a useful ingredient in warding off deflation. As the Japanese case attests, pegging interest rates, even at zero, may not be enough to defeat deflation and if one moves to "quantitative easing" the policymaker still needs a vehicle for the purchases and some way of gauging the expansionary effect. In the particular case of Japan, which imports most raw materials, policymakers could even focus on land, the value of which has plunged since 1989 and severely hurt the balance sheets of individual and commercial landholders alike.⁷

FOOTNOTES

1. Hanes (2004) shows that, during 1934-1939 in the United States, having overnight rates at zero did not preclude significant effects of reserve supply changes on longer-term interest rates. This implies that the interest-rate channel of monetary policy is not necessarily blocked even after short-term rates have been cut to zero.
2. Devarajan and Hubbard (1984) also consider the merits of this kind of intervention but suggest that selling futures contracts from the SPR is likely to have stronger effects on oil prices, and expectations, than purely spot market transactions. Their key focus is on combating “panic buying” in the face of a supply disruption. Hoarding of inventories and speculative demand would be discouraged so long as the futures contract sales “guarantee that a specified amount of SPR oil will be available at a certain time in the future. Thus ... the futures contract here plays the role of a credible guarantor of the government’s SPR drawdown policy...” (Devarajan and Hubbard, 1984, p. 189).
3. Quoted in Reed (1993, p. 71).
4. This section draws, in part, upon past work with Wang Fang (Burdekin and Wang, 1999).
5. An extension of the parity deposit system, implemented by the People's Bank of China in Hankou, instituted gold and silver parity deposits (Pien Hsieh Tsu, 1986, p. 92).
6. The list prices set by the state trading companies were still based on cost and profit--and the pricing of salt, for example, allowed for a profit margin of 3-7% (Hsia, 1953, p. 38).
7. On the importance of this link, see Kuttner and Posen (2001) and Burdekin and Siklos (2004).

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TABLE 1: Silver Purchases under the Sherman Act, 1891-1894

<u>Fiscal Year</u>	<u>Millions of Fine Ounces</u>	<u>Cost in Millions</u>	<u>Average Price per Ounce</u>	<u>Bullion Value per Silver Dollar</u>
1891	48.393	\$50.577	\$1.045	\$0.808
1892	54.356	51.107	0.940	0.727
1893	54.008	45.531	0.843	0.652
1894	11.918	8.716	0.731	0.566
TOTAL	168.675	\$155.931	\$0.924	\$0.715

Source: Laughlin (1901, p. 299).

TABLE 2: Currency Expansion Before and After the Sherman Act, 1889-1896

Year (End of Month)	<u>Silver Coins</u>	<u>Silver Certificates and Notes of 1890</u>	<u>Gold Certificates</u>	<u>US Notes and Currency Certificates</u>	<u>National Bank Notes</u>	<u>Total Currency</u>
<i>(In millions of dollars)</i>						
1889 (March)	108	251	129	321	218	1,027
(September)	110	277	117	325	200	1,029
1890 (March)	112	291	135	340	186	1,064
(September)	118	316	158	341	177	1,110
1891 (March)	120	344	144	345	168	1,121
(September)	120	379	113	345	166	1,123
1892 (March)	121	404	154	354	169	1,202
(September)	125	434	121	340	165	1,185
1893 (March)	126	452	112	334	172	1,196
(September)	123	474	80	340	201	1,218
1894 (March)	113	470	70	344	197	1,194
(September)	113	452	65	323	203	1,156
1895 (March)	114	445	49	294	203	1,105
(September)	117	437	51	304	207	1,116
1896 (March)	118	441	43	266	214	1,082
(September)	117	443	39	284	221	1,104

Source: Timberlake (1978, p. 32).

TABLE 3: Composition of US Currency Before and After the 1934 Silver Purchase Act

End of June	<u>Total</u>	<u>Gold</u> ^a	<u>Silver</u> ^b	Federal Reserve <u>Notes</u>	<u>Other Currency</u> ^c
	<i>(in millions of dollars)</i>				
1932	5,408	882	640	2,780	1,107
1933	5,434	299	647	3,061	1,428
1938	6,461	78	1,612	4,114	655

Notes:

^a Includes both gold coin and gold certificates

^b Includes silver dollars, silver certificates, Treasury notes of 1890 and subsidiary silver

^c Includes National Bank notes, minor coin, US “greenback” notes and Federal Reserve Bank notes

Source: Friedman and Schwartz (1963, p. 492).

TABLE 4: Communist Note Issue and Prices, 1948-1950

	Cumulative Note Issue (in billions of renminbi)	Wholesale Prices (Index for 13 Major Cities)
December 31, 1948	19	100
January 31, 1949	--	153
April 30, 1949	--	287
July 31, 1949	280	1059
September 30, 1949	810	--
October 31, 1949	1,100	--
November 30, 1949	2,000	5376
December 31, 1949	2,670	--
February 28, 1950	4,100	--

Sources: Note issue data are from Ch'en (1984, pp. 29, 39), Pien Hsieh Tsu (1986, pp. 95, 112) and Hsüeh (1986, p. 28). Wholesale price index given by Ma and Kao (1990, p. 18).

TABLE 5: Bank Deposits in Shanghai, Tianjing and Hankou in 1949

	Bank Deposits in Shanghai (in renminbi)	Bank Deposits in Tianjing (in renminbi)	Bank Deposits in Hankou (in renminbi)
October 1949	77,736	160,913	41,497
November 1949	4,204,109	296,061	103,204
December 1949	6,924,658	482,139	1,073,246

Source: Pien Hsieh Tsu (1986, p. 109).

TABLE 6: Income Sources in the Communist Draft Budget for 1950

Item	Percentage of Revenue	Percentage of Total Budgetary Income (Including Deficits)
Public Grain	41.4	33.7
Other Taxes	38.9	31.6
Income from State Enterprises	17.1	13.9
Income from Warehouse Clearance	2.4	1.9
Other Receipts	0.2	0.2
Deficit made up by Bonds		7.2
Deficit made up by Note Issue		11.5

Note: The above budget was issued in Beijing in December 1949.

Source: Chao (1952, p. 2)