Combining International Monetary Reform with Commodity Buffer Stocks : Keynes, Graham and Kaldor[1]

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Abstract

Central to John Maynard Keynes (1941) original Bretton Woods proposal was an international clearing union that would issue a new international currency by fiat called bancor. Among other functions, this international central bank would finance the stabilization of individual commodity prices through commodity buffer stocks. Benjamin Graham's (1944) proposal to Bretton Woods was to also create a new international currency, different from gold or a key country currency, but this new currency would be fully backed by a basket of raw materials. This commodity reserve currency would not only serve in international payment and settlement between central banks, but could be used privately and issued privately through the production of commodities. Both plans went nowhere. In 1964 at the first UNCTAD meeting Nicholas Kaldor revitalized the Graham proposal for international monetary reform and a commodity reserve currency. He addressed the growing crisis in global imbalances between industrialized nations and the under development of nations dependent on commodities for export income. All three proposals were attempts to resolve global imbalances, offer an anchor to real exchange rates, tame cost-push inflation, promote free trade, allow autonomous employment and credit policies, and provide the resource security necessary for equitable robust growth and world peace. In 1972 Kaldor thought that the commodity reserve currency was 20 years ahead of its time. This paper suggests that it remains a futuristic goal rather than something for an outdated era.

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Key Words: Keynes, Benjamin Graham, Kaldor, commodity buffer stocks, international Reserve Currency, international monetary system, global development

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A. Introduction

Keynes, Graham and Kaldor proposed international macro policy management schemes that would offer automatic stabilizers to the international business cycle. Inherent to each was a belief that global trade and sustainable economic development could be promoted through the use of international commodity buffer stocks. All three thought that the market system was inefficient and wasteful in the pricing of primary commodities - it had too many positive feedbacks, production delays, risky carrying costs, multiple equilibria, and inequality in access. All agreed that a far superior mechanism was the 'ever normal granary' or public commodity reservoir. At a small cost, relative to its gains, a buffer stock of commodities could be used by an international authority to stabilize prices and quantities for private producers and consumers.

The introduction of an international ever normal granary would improve the outcomes of private sector production and consumption of commodities - promoting greater investment and anchoring speculative expectations. Their macro proposals are compared and discussed below. This is followed by a history of the volatility of commodity prices that has been increasing over the past 140 years, and the micro economic solutions from the past 30 years that were used to address the havoc that this caused developing countries. The paper then concludes that both Keynes ideas for an international clearing union should be adapted towards a commodity reserve currency. In an appendix is an outline of what the commodity unit of Graham and Kaldor would look like, as well as a simple mechanical portrayal of the payment and settlement between nations under the Gold standard, a Bancor standard à la Keynes, a Bancor standard à la Graham and Kaldor, and the current US dollar standard. Its purpose is to remove the mystic of a commodity reserve currency and highlight the similarities and differences between what are in effect different accounting methods for exchanging and storing tangible and financial assets.

B. The Plans

John Maynard Keynes

In the lead up to Bretton Woods, Keynes (1941) had envisaged five international postwar institutions: the International Clearing Union (ICU), a reconstruction and relief organization, an international fund to finance an international police force and disaster relief, an international trade organization, and international commodity buffer stocks. The latter would be managed by an agency he called the International Commod Control (ICC), where 'commod' was the generic term for an individual commodity. It was best outlined in a draft in 1942 and published after his death in 1974 entitled "The International Control of Raw Materials." [2] While his plan was never seriously considered outside British government circles, Keynes and some of his fellow economists (such as Roy Harrod and Dennis Robertson) regarded it as an issue of utmost importance for securing stability and prosperity in the post war world (Kaldor 1983, p. 243).

Keynes' ICU was the financial core that supported his plans for global governance. The visionary component of Keynes ICU was that he had a *lender* of last resort and put a symmetric burden on both deficit and surplus countries to resolve imbalances, avoiding the deflationary bias that occurred under the gold standard where reserves were scarce due to lack of production and hoarding. This international central bank was designed to place an expansionist, rather than a contractionary pressure on world trade.

In contrast the resulting Bretton Woods institutions, the International Monetary Fund (IMF) and the World Bank (WB) were much narrower in their macroeconomic ambitions.

[2] Keynes was originally encouraged to create an international commodity fund by Roy Harrod who had also promoted the work of L. St Clare Grondona who advocated commodity buffer stocks as a tool of macroeconomic policy, as early as 1939 and as late as 1972 (see Grondona 1972, p.9).

Skidelsky suggests that this is due to the difference in opinions between America and Britain on the breakdown of the gold standard in 1931. The British saw it as a refusal by surplus countries to spend their surpluses – e.g. the United States and France had a 'liquidity preference' for gold. The Americans saw it as the lack of monetary discipline of deficit countries such as those in Latin America (Skidelsky 2005, p.21).

Keynes had preferred rules-based over discretionary counter cyclical policies. The balancing of deficit and surplus reserves was through cooperation and agreement to these rules by its members. The ICU would impose penalties on surplus and deficit countries and strong incentives for surplus countries to spend their reserves held in excess of their quota. Exchange rates would for the most part be fixed with capital controls, though adjustable to equate wage efficiencies across countries and balance trade.

In terms of commodities the ICC, financed by an overdraft from the ICU, would stand ready to buy or sell commodities if prices fall or rise more than 10 percent below or above the long run fundamental price (the long run cost of the most efficient producer). Stabilizing the commodity cycle would promote trade and adequate world effective demand during a world slump.

> "At present a falling off in effective demand in the industrial consuming centers causes a price collapse which means a corresponding break in the level of incomes and of effective demand in the raw material producing centers, with a further adverse reaction, by repercussion, on effective demand in the industrial centers; and so, in the familiar way, the slump proceeds from bad to worse. And when the recovery comes, the rebound to excessive demand through the stimulus of inflated prices promotes, the same evil manner, the excesses of the boom" (Keynes 1942 CP vol 27 p. 121).

Keynes knew well that politically the financing of these buffer stocks would be a large hurdle to the adoption of this program. But he argued that the large sums of money involved in such a scheme was a positive since it offered an easy to implement 'weapon capable of producing

large effects … in both directions on a scale and with an immediacy which is quite impossible for projects of public works.' (Ibid p. 122).

In addition, the existence of an ICU would reduce the problem of cost greatly – pooling the burden of carrying stocks. Without an ICU, a national program that tries to stabilize producer commodity prices for its exports will carry more stocks precisely at the moment when it is least able – during a decline in demand for its product and an unbalancing of its international position (Ibid p.129). Alternatively, having an ICU to back the ICC would render a producing country's raw material stocks always liquid, that is:

> "A producing country is always paid for its output at or above a reasonable minimum price, whether or not the whole of this output passes immediately into consumption, and paid for it in *liquid cash* [Bancor] which it can employ on maintaining its normal volume of imports and its normal standard of life, thus retaining its own stability and being no longer the occasion, by repercussion, of instability in others. There can be no question that the scheme proposed would be of the very greatest value to raw material countries, especially to those which are financially weak, with overseas debt and lacking in reserves or are highly specialized in their produce" (Ibid p. 129).

While Keynes scheme promoted free trade and competition between commodity buyers, sellers and middle men within the 20 percent price range, thus removing the negative spillover effects that subsidies produced in depressing commodity prices, but there were limits that should be enforced:

> "It is necessary…that buffer stock schemes should be framed on lines which leave each country free to give subsidies to their own producers, in order to maintain their standard of living at whatever level they consider suitable. Nonetheless it must be recognized that a real difficulty arises if such subsidies are given on a substantial scale by the wealthier countries. For the effect of the subsidies is likely to be to maintain a larger volume of production in the countries giving them, and thus to check any tendency which might otherwise exist towards a redistribution of world production in favor of countries with more restricted economic opportunities" (Ibid p.124).

Keynes emphasized, "this scheme is a means, and perhaps the only means, of implementing the often-repeated undertaking of free and equal access for all countries alike to the sources of supply of raw materials" (Ibid p.129), the market will not provide such resource or democracy:

"The competitive system abhors the existence of stocks, with as strong a reflex as nature abhors a vacuum, because stocks yield a negative return in terms of themselves. It is ready without remorse to tear the structure of output to pieces rather than admit them, and in the effort to rid itself of them." Keynes (1938, pp. 449)

Keynes did not go so far as to argue for Bancor to be backed by commodities, though the price of Bancor would be pegged to gold. Earlier, in the *Treatise,* Keynes advocates a gold standard which is pegged to an index of 62 internationally traded commodities (Metzler 1988). Since gold prices were unresponsive to the business cycle, this would allow for greater monetary management and responsiveness to changes in investment. He assumed that domestic prices and real wages would fluctuate around such a tabular standard. In his response to Frank Graham's advocacy for a commodity reserve currency as a solution to international monetary reform in 1940, Keynes was supportive but thought the idea as one for the future.

> "I have no quarrel with a tabular standard as being intrinsically more sensible than gold. My own sympathies have always fallen that way. I hope the world will come to some version of it some time. But the opinion I was expressing was on the level of contemporary practical policy; and on that level I do not feel that this is the next urgent thing or that other measures should be risked or postponed for the sake of it…. The right way to approach the tabular standard is to evolve a technique and to accustom men's minds to the idea through international buffer stocks. When we have thoroughly mastered the technique of these, which is sufficiently difficult without the further complications of the tabular standard and the oppositions and prejudices which this must overcome, it will be time enough to think again" (Keynes (1940, pp. 429-430).

Benjamin Graham

Even prior to Keynes commodity buffer stock plans, Benjamin Graham (1937) worked on a national plan that backed the US currency with a basket of commodities.[3] He extended his proposal to an international currency in 1944 following similar global versions from Frank Graham (1942) and Hayek (1943). Like Keynes, Graham had seen the waste and irony that came with the destruction of excess commodity supplies and the strong liquidity preference of the market.

> "[I]f surplus stocks do operate as a national liability rather than an asset, the fault must lie in the functioning of the business machine and not in any inherent viciousness of the surplus itself…Some means must be found to restore the Goddess of Plenty to the role of benefactress-in-chief that was hers without question under a simpler economy." (Graham 1937, pp.16-17)

The originality of Graham's plan, compared to traditional commodity buffer stock schemes, was that it would stabilize an index or average price of a collection of 15 to 60 storable commodities (the broader the better). Relative prices of individual commodities could float according to supply and demand. The composition of the index could be modified from time to time in accordance with suitable statistical techniques. Annual corrections might be based on 10 year moving averages of world production and exports. Private sellers of commodities would be paid just as they are now for their commodities in dollars.

Storage would be contracted out to vendor nations or buying nations for reasons of supply security. Storage costs could be paid for by those who chose to store, profits from buying low and selling high by the ICC, profits from sale of spot for future contracts at a lower price during periods

[3] Graham is well known for his microeconomic advice to investors with his book on fundamental investing, *Security Analysis* (1934) co-authored with David Dodd, still known as the bible of Wall Street. However his macroeconomic advice to policy makers is today largely unknown - *Storage and Stability* (1937) and *World Commodities and World Currency* (1944). Both orientations emphasize the intrinsic value of assets behind short run market prices.

of temporary shortage in individual commodities, or finally by assessed contributions against member nations.

The purpose of the buffer stock is to keep an index of world commodity dollar prices stable within a narrow band, Graham used a 10 percent spread between the buy and sell price of his commodity basket. Stabilizing the commodity unit within the 10 percent band via open market operations would supply reserves counter cyclically as long as commodity prices were positively related to world economic expansion or contraction. In situations of negative correlation due to supply constraints during a downturn some adjustment up of the commodity index could be made. Unlike gold, as the commodity unit rises so too do food, energy and manufactured goods to the extent that they are priced off raw material inputs. Since individual countries can choose to fix or have flexible exchange rising wages in a country can be offset through a devaluation. Countries are also free to run their own counter cyclical fiscal and monetary policies given flexible exchange rates.

While private capital flows are not restricted in finance balance of payment deficits, Graham distinguished his system as a coinage mechanism rather than a credit mechanism. Low income countries compelled to import more merchandise than they export, have an alternative to either the accumulation of debt, foreign aid, selling of their assets, or fight to have trading partners lower their tariffs and accept their goods. On the other side, the issuance of a commodity reserve currency means the accumulation of reserves by surplus countries that can now be converted into material inputs for their manufactured goods whenever they want. Under a system of financial asset accumulation it is not clear that "a chronic-credit nation can spend its fund deposits on goods" (Graham 1944, p.93).

Like Keynes, Graham saw the commodity reserve currency as one that would solve trade disputes by allowing autonomy in policies rather than demonizing trade barriers as pure mischief (Ibid 1944, p.11). While stabilizing an index would be far less effective in negating the effects of individual commodity subsidization programs, it would not lead to an excess build up of one particular commodity out of proportion with industrial use.

The primary goal is to promote investment and the improvement of productivity in the production of commodities so that we live in a world of abundance and sound management principles, rather than destabilizing market speculation. Making commodities liquid will negate the market's abhorrence of stocks that ordinarily puts downward pressure on prices.

Graham's International Commodity Corporation (ICC*) bundled Keynes ICU and ICC into one institution. The purchase price of stockpiling would be paid for by the issuance of inventory receipts that would back the new international reserve currency. Like Keynes, Graham emphasized a rules based system over discretionary policy. Both had international reserves as deposits only by member central banks.[4] The primary difference between Keynes's and Graham's was his stabilization of an index rather than individual prices. In terms of their automatic counter cyclical properties, both used the stabilization of the commodity cycle and the injection of international reserves to commodity producers to stimulate demand. As opposed to the gold standard, here a large number of world incomes and employment depend on the production of raw materials, and stabilization would be faster, on a larger scale and with a more equitable access to reserves.

Under Graham's plan the creation of reserve assets is not based on reciprocal debt or the accommodation of imbalances, but relies solely on the generation of income and production

[4] Grahams Bancor is modified for private holding in the appendix, like gold

through a 'commodity multiplier' similar to the foreign trade multiplier of Harrod. This was much better explained later by Kaldor, who emphasized the stabilization of the commodity unit at a price that would equilibrate the terms of trade between commodities and manufactured goods. Keynes on the other hand clearly accommodated and limited global imbalances, through agreed upon rules forcing surplus countries to spend and increase demand for deficit country goods.

In 1944 Benjamin Graham and Frank Graham created a committee which included numerous academics, Wall Street practitioners, and government policy makers, who signed on to support the inclusion of the commodity reserve currency into the International Monetary Fund charter.[5] Below are the 4 primary advantages to a commodity reserve currency that Graham noted in that proposal and a brief explanation:

1. *Real Exchange Rate Stability*

The primary importance was for a standard of value that like gold could yield an income to its producers. This would enlarge the means by which developing nations could import manufactured goods rather than relying on debt. This purchasing power would remain even if the primary commodity producing nation would devalue its own currency relative to the commodity reserve currency.

2. *Price Stability*

By stabilizing the average price of raw materials Graham felt that it would be a significant stabilizer on the price of finished goods and overall inflation. Frank Graham was more accepting of Keynes skepticism that wage inflation in manufacturing would be a greater issue. Frank Graham advocated flexible exchange rates for sovereign currencies to equate efficiency wages. Whether fixed or floating, the option of a real anchor would create a benchmark for all other prices.

[5] Still alive today Irving Kahn was a supporter on this Bretton Woods proposal and has remained a tireless advocate of commodity buffer stocks. See his http://bufferstock.org website

3. *Existence of Buffer stocks*

Graham's proposal provides the world with self-financing and interest free raw material buffer stocks which do not threaten commercial markets. Like Keynes, Graham was acutely aware of the great fear that businessmen held of buffer stocks and the downward impact on prices. But their creation would not only remove price manipulation from local monopolies, but encourage output expansion. While market proponents advocate price stabilization through futures and price insurance. Buffer stocks importantly offer quantity insurance.

4. *Expanding World Growth*

While Keynes' plan would give a reprieve to deficit countries allowing them to increase their borrowing and stimulate world demand through forced spending of surplus countries, Graham's motivations were quite different. He wanted to subordinate international money, or the clearing of international payments, to the production of useful goods and services. Since commodity units are clearly better things for creditor nations to own than claims against issuers this should come about. "Commodity units afford every country the opportunity to transmute its own productivity into sound international monetary units free from demoralizing fluctuations in exchange value" (Ibid 1944, p.90). Graham often called this his *groceries first* proposal.

Nicholas Kaldor

Post Bretton Woods, while affiliated with the United Nations, Kaldor was the primary draftsman of two bold international coordination policies. The 1949, *National and International Measures for Full Employment* (NIFE), and the 1964, *The Case for an International Commodity Reserve Currency,* which was submitted at the first meeting of the United Nations Conference on Trade and Development (UNCTAD). Both proposals dealt with maximizing the productive use of

each economy's resources and promoting economic progress - moving the world to its production possibility frontier.

In the latter proposal (Hart, Kaldor & Tinbergen, 1964)[6] Kaldor advocated Graham's international commodity reserve currency to achieve three goals. Firstly he wanted to resolve the international liquidity crisis of the 1960s where the limited growth in gold reserves had pushed the US dollar into the role of key currency reserve, and whose growth was dependent on unsustainable US balance of payment deficits. Secondly Kaldor wanted to promote industrialization of the world's poorest countries. Thirdly, he believed that an international monetary system should allow for domestic monetary and fiscal autonomy.

Kaldor called the commodity reserve currency Bancor. In contrast to Graham, he excluded commodities like coal and oil from the buffer stock. Commodities with large volumes of trade and volatile prices would have too large an impact on the other commodities in the basket. Only commodities that were free of price manipulation were included. Kaldor initially proposed to stabilize the gold prices of the commodity index rather than US dollar prices as with Graham. This was more in keeping with Keynes Tabular standard and recognition that the US too should have the option to devalue their currency if need be with respect to Bancor. Like Frank Graham, Kaldor was more sympathetic to flexible or adjustable exchange rates.

Kaldor emphasized the manner in which a commodity reserve currency would equilibrate the terms of trade between commodities and manufactured goods in two ways. One was through cumulative causation, a positive feedback between the two sectors given the buyer of last resort as back up (see below). The other was through a reasonably stable relationship between raw material and industrial prices. In disagreement with conventional thought, Kaldor thought that a

[6] Kaldor drafted the text (Hart, 1991, p. 562); Tinbergen was primarily a signatory (Toye & Toye 2004, p. 221).

slow improvement of the terms of trade towards commodity producers would be a positive outcome for world growth. A deteriorating one would mean lower growth for both the industrial and primary sectors. Kaldor predicted that a volatile relationship in the terms of trade, as seen after the break down of Bretton Woods and its fixed exchange rate regime, would portend a deterioration in terms of trade between commodities and manufactured goods as investment and productivity in raw materials would decline, industry would substitute to and from different supplies, the industrialization of low income commodity producing countries would be hampered, and incomes for both primary and secondary sectors would contract. These broad conclusions come from his closed accounting formulation of world growth, productions and payments; global imbalances due to beggar thy neighbor devaluations; and the destabilizing impacts of commodity speculation. Each is considered below.

1. Circular cumulative causation

Kaldor's distinction between the 'primary' and 'secondary' sectors—'natural resources' and 'industry' —is central to his explanation of the inherent global disparity in economic development between the industrialized North and the commodity-producing South (see Kaldor, 1976, 1979, 1977, 1981, 1983). In Kaldor's view, natural resources such as agricultural, mineral, or energy resources, are 'neoclassical' commodities: stocks are generally 'fixed' in the short run, market clearing is obtained through price adjustments, and for a given technology there are decreasing marginal returns to factor use. Like the Physiocrats, Kaldor believed that productivity gains in agriculture were typically from 'land saving' rather than labor saving techniques. In contrast the manufacturing sector, which transforms primary commodities into capital or consumption goods, exhibits increasing returns to scale and has monopolistic features. Each firm needs to increase market share or its products will be squeezed out of the market. In the long run resource limits

for non-renewables may ultimately constrain capital accumulation, while labor is seen as being in excess world supply for some time to come. In practice, the accumulation of capital is limited only by the demand for these goods (Kaldor, 1983, p. 534). Firms usually operate at less than full capacity with administered (mark-up) prices on costs. Disequilibria in manufactured goods markets are reconciled by changes in the quantity produced (and attendant changes in unemployment, real income, and capacity utilization), while prices remain fixed. The labor market is likewise demand constrained given the mass of underemployment in the developing world especially its rural areas.

The industrial sector is the most dynamic and modernizing sector of a country's economic development and it will have a rate of growth that is mainly determined by the demand for its products from *outside* the sector (Kaldor 1983 p.242). This could be export demand, or demand coming from the agricultural sector *within* a country. Since not all countries can be net exporters, in the limit wealth from the outside is generated by surpluses from land (rather than labor or capital). If growth and income in agriculture is sped up, then their spending will also multiply through to growth in the industrial sector – a commodity multiplier. In an open economy this type of exogenous demand can also come for exports, à la Harrod's foreign trade multiplier. These multipliers were seen as more effective than exogenous government spending when a country has many leakages to imports.

If there is a fall in commodity prices, then conventional theory suggests that the rise in purchasing power of the industrial sector should stimulate additional demand within this sector. But instead there will be a fall off in demand for manufactured goods by the primary sector, this will lead to a reduction in world investment in the primary sector, which is normally financed from the industrial sector, again leading to a fall in manufactured goods. Thus a fall in commodity

prices relative to manufactured goods has a tendency to depress rather than stimulate (Hart et al 1964, p.163).

> "While any given rate of expansion of primary production may be more than is required to support the industrial expansion of the countries which are *already fully industrialized*, it can be viewed as 'excessive' only if we ignored the possibilities of accelerated industrialization I all those areas which still have large labor reserves in agricultural sectors, and whose industrialization could be stepped up very considerably under favorable conditions" (Hart *et al* 1964, p.164).

2. Equilibrating Exchange Rates

Kaldor (1983) believed that the right monetary system would equalize trade balances on manufactured goods between countries. Currency unions were not the solution. Under Verdoorn's law Kaldor described the cumulative causation of a manufacture based economy that becomes a leader in international trade. Increasing returns to scale, both internal and external, would allow for rising productivity, greater market share and again rising productivity – an effective real devaluation. This positive feed back can occur even in the face of high employment and rising wages if productivity is rising faster. These 'go-ahead' countries have a more competitive efficiency wage that shifts manufacturing away from other periphery countries and to their center. The periphery then imports more, de-industrializes and advances by either the financialization of their economy or putting up protective trade barriers.[7] The solution in such a world under fixed exchange rates would be for the periphery to devalue and peg to a lower exchange rate.

However currency realignment has not always been successful in reducing surpluses. In Kaldor's study of appreciations of Japanese and German exchange rates in 1960s and 70s, even with rising labor costs relative to their trading partners, their share of world trade continued to increase at the expense of the US and UK (Kaldor 1983). Kaldor concluded that the appreciation of

[7] Such a process was recently described by Martin Wolf in his grasshopper and ant fable in the *Financial Times* (May 25th, 2010), and is similar to the cumulative causation that Kaldor took from Myrdal.

the Japanese and German currency compensated rising prices of food, industrial materials and oil relative to other manufacturers. This, along with Verdoorn's law allowed these countries' trade surpluses to continue to grow.

Kaldor's answer to this dilemma of setting the right exchange rate was to focus on the terms of trade between manufactured goods and commodities - the raw materials essential to industry. There should be a trade off between ones income from exports and competitiveness. Countries that are the most efficient in producing goods should be the ones to have a competitive edge in exporting. Ordinarily, a manufacturing exporter that imports its raw materials (e.g. China) a devaluation will raise its cost of raw materials and create domestic inflation possibly lead to rising wages and slower productivity growth. Ordinarily, this would raise the cost of manufactured exports and lower competitiveness. But this occurs when countries are alone in maintaining a low exchange rate relative to the international standard (e.g. the US dollar). If there are many other emerging market nations that are also devaluing their currency, including those that primarily sell commodities, all hoping to create a competitive edge and develop their manufacturing base through export-led growth, then this trade off does not occur (Kaldor 1972). The price of the 'value added' by processing activities in terms of basic inputs (food and raw materials) does not decline and there is no real cost to devaluing.

He concluded that if manufactured exports were priced in commodity units this would offer at better balance between the manufacturing trade between the highly industrialized nations and prevent the industrially dominating 'go-ahead' countries from growing through unrequited exports, *at the expense* of other industrial countries, effectively stopping them from exploiting their own growth potential and ability to pursue policies of full employment (Kaldor 1972). Developing countries who primarily export commodities and have the natural resources internally

to promote industrialization might benefit from devaluation and promoting their manufactures and export-led growth. If everyone does this it will put downward pressure on commodity prices reducing their terms of trade. Under a commodity reserve currency commodity prices would remain steady on average and such trade offs would not have the negative spillover effects they now have.

3. The Destabilizing Effects of Commodity Speculation

Kaldor (1986) characterized commodity prices in unregulated markets as a yo-yo, moving up and down by very large amounts, even within a year or less. The market mechanism alone can not ensure a long-run compatibility between the growth of available primary products and the growth of industry.

> The efficiency of this [market] mechanism … depends crucially on the professional traders' willingness to absorb stocks or release stocks in response to variations in market prices that were not unduly large. This in turn depended on the traders having a *firm* expectation of a long run normal price for each commodity, deviations from which would be considered as temporary. The firmer or the more certain the expectation of a normal price …the greater was the traders' willingness to increase their stocks in response to a fall in prices and *vice versa*. ….. Once this belief is impaired or destroyed by the instability of actual prices, the traders' subjective appreciation of the risks incurred in holding stocks is increased, with the result that they require a higher expected compensation for any departure – upwards or downwards – from their normal commitments (their normal stock/turnover ratio). But this means in turn that any variation in the carry-over of stocks from period to period will be associated with a even greater variation of prices, which in turn will have further repercussions on the traders' willingness to take risks. (Kaldor 1983 p.238 - 240).

Volatility in commodity prices will make professional traders shy away from commodity stockpiling causing even more volatility. The large positive feedback that speculators can have on commodity prices can change accepted norms among the mind set of other herding speculators. A commodity reserve currency would offer an anchor.

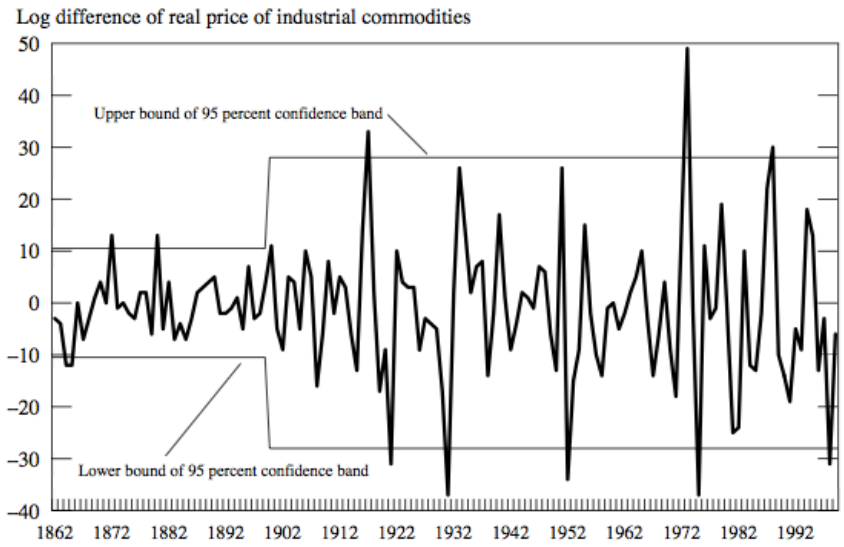
C. History of Commodity Price Volatility and Trends

The history of commodity prices is one of extreme volatility where trends are difficult to discern and highly variable. When valued in a single currency, its volatility is highly dependent on whether that unit is fixed or floating. *The Economist* Commodity Price index is the longest running series, back to 1845. It consists of the prices of textiles, metals, and nonfood industrial commodities, excluding energy, weighted by imports to developed countries. In the four decades prior to the First World War, and in the two decades prior to 1972, nominal prices of industrial commodities were remarkably stable, due to fixed exchange rates. Cashin and McDermott (2002) test *The Economist* price index for 1869 to 1999, USD prices, deflated by US GDP. They show in Figure 2 that prior to the breakdown of the Gold standard in 1913 annual volatility in industrial commodity prices was less than 20 per cent - 10 percent up or down. After this period there were several times that price swings reached beyond this range. After 1971 in the post Bretton woods era and flexible exchange rates the frequency with which price movements exceed two standard deviations appears to increase.[8] Similarly, the frequency of the commodity cycle is much higher in the post Bretton Woods period.[9]

[8] "In the roughly 70-year period from 1899 to 1971, movements in industrial commodity prices exceeded two standard deviations four times, while there were four price movements in excess of two standard deviations in less than 30 years from 1972 to 1999" (Cashin and McDermott 2002, p.188). This is also supported by (Cuddington & Liang 1999).

[9] They show that the mean duration of the floating exchange rate (1971-1999) large boom is *one-tenth* the mean duration of its Bretton Woods (1946-1971) counterpart, while the mean duration of the floating exchange rate large slump is *one-half* the mean duration of its Bretton Woods counterpart.

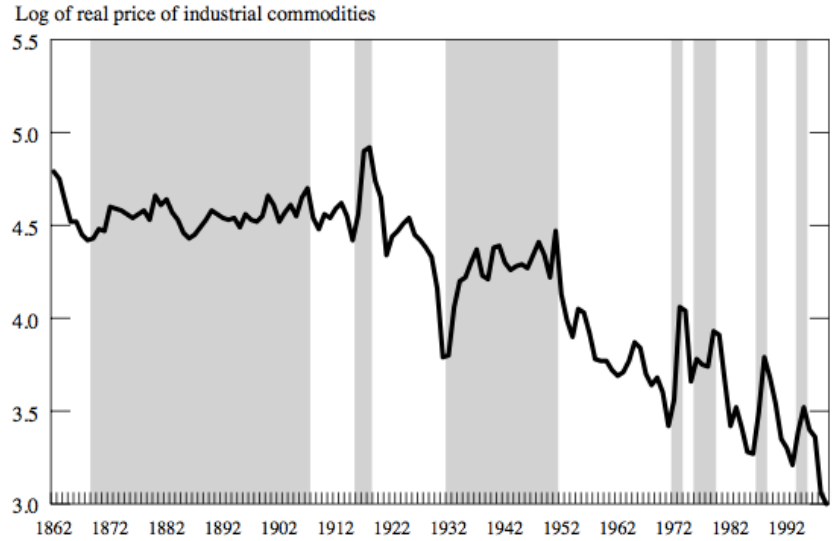
Figure 1. Volatility of Real Price of Industrial Commodities, 1862–1999



Cashin and McDermitt found a downward trend over the entire database (1862 – 1999) increasing in steepness from 1920, though thereafter no significant change in the slope of this trend.[10] Since 2002 this downward trend has been reversed though many warn that such changes are hard to differentiate from volatility. Despite this recent change, one can still conclude that changes in the long-run trends in real commodity prices are small in comparison with annual variability in prices, making short-run movements in commodity prices highly unpredictable but long run movements predictable. The degree of price volatility is commonly recognized as much more troublesome for commodity producers than the downward *trend*.

[10] *The Economist* commodity price index shows an average annual decline in real commodity prices of 1.3 percent per year until 2005 and since this time it has increased by around 12 percent each year.

Figure 2: Large Cycles in Real Price of Industrial Commodities, 1862–1999



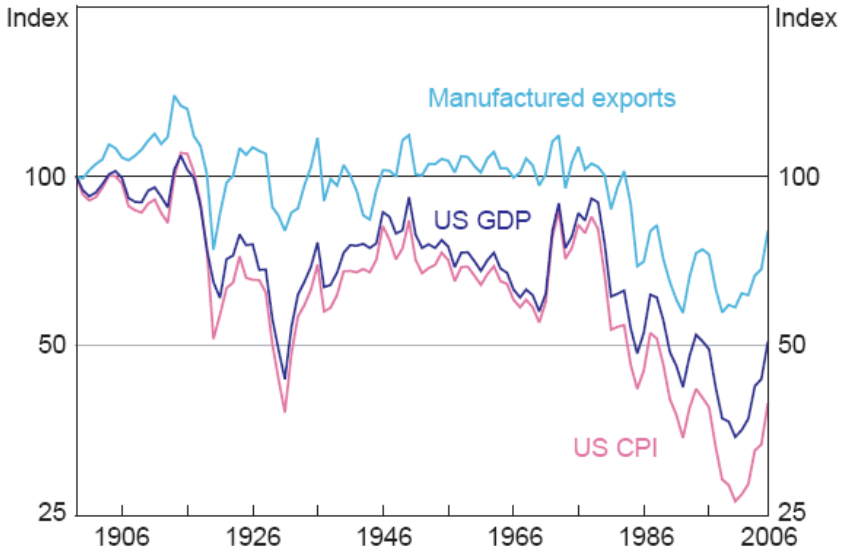
Notes: Shaded portions denote the boom phase, and unshaded portions the slump phase, of each large commodity-price cycle. A large boom (large slump) is defined as a period during which the level of real industrial commodity prices increases (decreases) by at least 25 percent.

Source: (Cashin and McDermitt 2002)

The controversial Prebisch-Singer thesis posits that the terms of trade have deteriorated against primary producers in favor of manufacturers, owing to the low income elasticity of demand for commodities and because total factor productivity increases have been smaller for manufactured goods than for primary commodities, thus price of commodities relative to manufactured goods should decrease over time.[11] Looking at the following graph using the Grilli and Yang commodity price index, which also excludes oil and coal, most of the decline in terms of trade between commodities and manufactures occurred only after the break down of Bretton Woods, see Figure 4. The fixed exchange rate Bretton-Woods era (from 1946-1971) was a relatively steady period for the terms of trade of commodity producers relative to manufacturers.

[11] It is controversial because, example Lipsey (1994) suggests that the relative price decline in commodity prices reflects quality improvements in manufactured goods that are not well reflected in the manufactured goods price index.

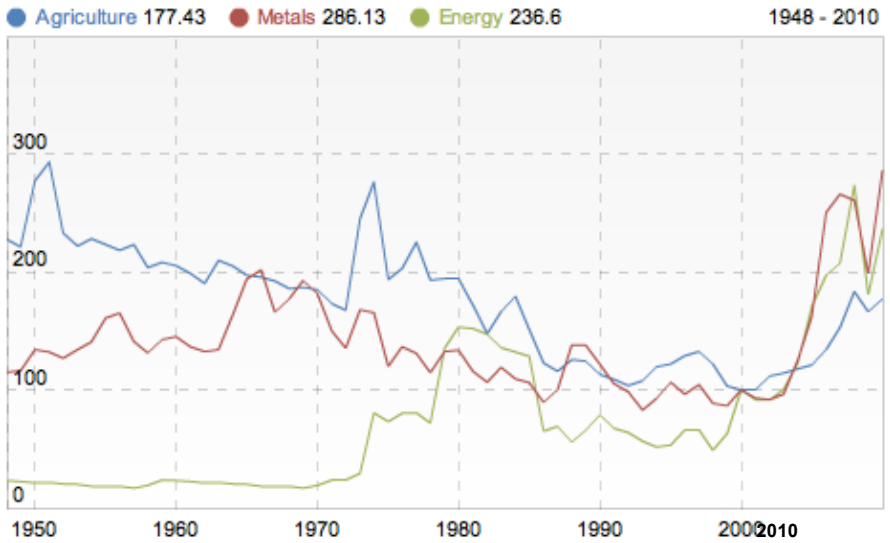
Figure 3. Real Commodity Prices
1900=100, log scale, deflators as indicated



Source: RBA Bulletin April 2007 and compiled from the Grilli & Yang (1988) index of 24 traded non-fuel commodities, modified by Pfaffenzeller et al. (2007).

Taking the World Bank commodity index, which is weighted by export shares from developing countries, and prices are data deflated by manufacturing, Figure 5 breaks up the index into agricultural, metals and energy. The decline during the post Bretton Woods period was mainly in agriculture and less in metals, and it has been reversed since 2002. Since commodity markets are global, and priced in dollars, fluctuating exchange rates will create volatility. But beyond this mechanical effect, these fluctuations have real effects on the supply and demand of commodities, which were elaborated by Kaldor.

Figure 4. Commodity Price Indices
(Real, MUV deflated) (2000 = 100)



Source: World Bank, Development Prospects Group
Accessed: http://economistsview.typepad.com/economistsview/2010/07/placing-the-200608-commodity-price-boom-into-perspective.html

With the move from fixed to floating exchange rates and the greater openness to trade, world demand cycles will cause volatility in supply constrained commodities where inventories are low, volatile commodity prices in turn reduces demand for those goods. Commodity production operates in competitive markets and unlike manufactured goods, surpluses are usually passed onto consumers rather than kept by producers. With an appreciation in the USD commodities prices generally fall as producers local currency depreciates and lower USD prices can be paid. The opposite occurs when USD is falling and local currencies are appreciating, commodity prices in USD must rise to compensate for lost income. A similar pattern arises from loose and tight credit in the global system. Tight credit scenarios and slow world growth are related to falling commodity prices while easy credit and world growth is tied to rising commodity prices. Cabellero *et al* (2008) link this to the shortage of financial assets and liquid private capital markets searching for yield and liquid funds.

Commodity exporting countries must carefully manage their export income which finances their foreign debt and imports of manufactured goods. Gilbert (1989) showed that with the USD appreciation of the 1980s there was a greater-than-proportionate real depreciation of developing country currencies and worsening terms of trade with manufacture import costs rising. The supply of commodities was boosted to maintain export revenues and to service growing debt obligations in the presence of credit rationing and the rising cost of dollar denominated debt. Accordingly the rising supply of commodities during this period dampened prices and led to a greater than proportionate dollar reduction in commodity prices relative to the USD appreciation. Reminiscent of Kaldor's (1932) destabilizing cobb web cycles.

Following the break down of Bretton Woods came the so-called Washington Consensus (1980-2008) that may have also contributed to commodity price volatility. Development agencies promoted micro economic remedies such as diversification away from commodities, removal of buffer stock and quota systems, foreign direction investment, hedging with futures, and a focus on international access rather than domestic supply security.

During the 1980s and 1990s, most developing countries undertook far-reaching reforms focused almost exclusively on market forces for more efficient resource allocation through improvements in the incentive structure and on reduced discretionary state intervention. Domestic investment for diversification, the remedy of choice, was made more difficult by the additional goal of trade liberalization. In part, this was answered by opening up the capital account to promote FDI in the manufacturing sector.

While reducing dependence on agricultural incomes, diversification also reduced food security and rural employment. Rural to urban migration increased and worsened poverty levels in the cities. Diversification away from rural production reduced the number of farmers,

strengthening the relative position of large farmers and corporations. In Africa, Latin America and the Caribbean most FDI did not promote manufacturing. Instead it was concentrated in resource extraction with weak linkages to the domestic economy (UNCTAD, 2006, p. viii). The weak bargaining and regulatory capabilities on the part of host-country governments transferred ownership of commodity production into the hands of large foreign-based transnational corporations.[12] Unfortunately diversification, which was meant to promote industrialization, manufacturing, technological upgrading, and the allocation of existing resources more efficiently through flexible prices, instead often led to deindustrialization, rising inequality, balance of payments difficulties, inflation, rising interest rates, and currency appreciation. These factors reduced domestic investment and compromised the international competitiveness of domestic producers, adversely affecting trade performance. By 2006 the orthodox reform agenda which was based on getting relative prices 'right' at the microeconomic level had been declared a failure: in too many cases it got prices 'wrong' at the macroeconomic level (UNCTAD 2006, pp. iv-v).

With the recent depreciation of the USD since 2000 we have witnessed a run up in commodity prices, in part to compensate the loss of income to commodity producers, there is renewed investment and restocking of inventories, and 'take back' of resources from private hands into the states. But commodity revenues have also led to rising USD surplus reserves and pressures for a greater than proportionate real appreciation of developing country currencies. While an appreciation may reduce the pressure on commodity prices it jeopardizes competitiveness of exports by industry, which is the dynamic sector of economic progress. For many commodity producers, such as Brazil, their natural choice will be to shift commodity profits

[12] UNCTAD (2006, p. 27) estimates that among countries who export mining products, two-thirds of their income gains from the improvement of the terms of trade since 2002 have been offset by higher net income payments abroad to transnational corporations.

back to industry through devaluing their currency. As stated above, countries like China benefit from such action.

The commodity boom that began in 2002 has been beneficial to many developing countries, raising their revenues and allowing them to pay down debt. The improvement in commodity producers terms of trade support their purchase of manufactured goods and thus the manufacturing exporters. So far it has raised cost-push factors only somewhat in the developed countries of US, Japan, or Europe which remain mired with weak growth after the global financial crisis. However it has had a far greater inflationary effect on emerging markets and the BRICs. More specifically the price rises have been catastrophic for a few developing countries that are net importers of commodities, particularly of food staples, raising food insecurity.

Developed countries that depend on energy and commodity inputs from foreign sources remain vulnerable to price manipulation from resource rich countries. Those countries that are industrializing at a rapid pace, for example Brazil, India, China and Russia, are securing monopolies of raw materials through acquisition of sources and strategic reserves. For all countries, securing raw materials is increasingly part of foreign policy negotiations.[13] While there has been growing free trade in capital flows and manufactured goods, trade in commodities, particularly agricultural goods, remains mired in political wrangling.

Of growing concern has been the increasing use of commodity derivatives and commodities as a speculative financial asset. The financialization process of commodities precipitated by the rapid growth of index investment to the commodities markets, has contributed significantly to the recent volatility of commodity prices in oil and other non-energy commodities (Tang and Xiong

[13] In 2009 the US was dependent for more than half of its supply of 38 imported minerals. For 19 of these the US was 100% dependent. In contrast, the US was 100% dependent on just 7 in 1978, and more than half of its supply was dependent on just 38 imported commodity minerals. (http://minerals.usgs.gov/granted.html)

2009). In response there has been greater consideration of regulation of organized futures markets, imposing position limits and limiting non-commercial traders from dominating prices. Veneroso (2009) has warned that this may backfire: many funds faced with the prospect of increased regulation in commodity derivatives, are moving toward investing in the physical commodities rather than their derivatives to avoid regulation. The move into physical stocks for speculation with ETF funds and physical funds will lead to an even greater imbalance with supply and demand, market manipulation, cornering and market squeezes which could lead the entire forward curve to rise (Ibid).

D. Conclusion

Trading in non-fuel commodities account for 14 percent of global trade and fuel another 7 percent; combined, they account for more than one-fifth of global trade. Raw materials are 40% of Latin American exports. Of developing countries 95 out of 141 depend on commodities for more than half of their export earnings. For 70 of these, such revenues were generated by only three commodities (Fréchette 2003).[14] Even though commodities constitute a declining share of economic activity, our demand for them will continue to grow in absolute terms.

Despite the attempt to be less dependent, after 25 years of market reforms, the commodity sector continues to be the mainstay of many developing country economies in generating income, savings and foreign exchange, as well as employment and livelihoods. The well-worn policy advice given to developing countries to acquire the financial skills to minimize risk and to diversify

[14] Among sub-Saharan and African countries commodities typically exceed 50% of total exports, especially for Burundi (97%), Madagascar (90%), and Zambia (88%). Even among a few developed countries (Australia, Iceland, Norway, New Zealand, and Canada), the share of primary commodities in exports is quite high (54%, 56%, 63%, 36%, and16% respectively) (Cashin et al., 2002).

production so as to stabilize income or export revenue, has missed the need for an integrated model of agriculture and industry at a national and international level.

According to Kaldor, advocating diversification misses the point that the production of primary commodities is essential to world growth, in rich and poor countries alike. Economies progress in stages, and at every stage commodities are essential, even if they become a smaller and smaller share of employment. After all, it is the growth of output in primary commodities that sets the limits on growth in manufacturing. In Kaldor's simple two-sector model it is not necessary that agriculture and industry grow at the same rate, but their growth must be balanced with one another, else overall growth will be constrained.

Historically a period of falling commodity prices is tied to a slowing of world growth. There is a positive feedbacks that turns such events into long slumps. A commodity reserve currency, or individual commodity buffer stocks, would support primary sector incomes, stimulate their purchases of manufactured goods, and offer the supplies of primary products needed increase the rate of growth in the manufacturing sector.

With transference of the world's manufacturing from the developed economies to China, countries that produce raw materials and countries that import manufactures will increasingly face imbalances in their trade accounts, but there will be limited scope for bilateral negotiations to resolve these problems. The extent to which developing countries and the world will continue to benefit from tightening commodity markets will depend on the political responses of the large industrial powers and on the evolution of supply and global demand.

Commodity supply insecurity may lead to geopolitical jostling and to exclusionary practices to lock up supplies. Rising commodity prices may elicit a tightening of monetary policy in the developed world which would reduce growth for imports from developing countries. An

unwinding of the US current account deficit means reduced reliance on US consumption as a driver of global demand. These trip wires threaten not only world growth but also world peace are addressed in the commodity plans put forward by Keynes, Graham and Kaldor. At their heart, these international monetary reforms try to balance consumption and production and spread the issuance of reserves, more democratic, stabilizing and expansionary.

In the appendix are some tables that attempt to show the simplicity of the commodity reserve currency and compare it to the gold standard, the dollar standard, and Keynes ICU. In either the Keynes or the Graham-Kaldor plans, the stabilization of commodity producer incomes is key to smoothing the world business cycle. The central advantage of either scheme is that an increase in primary production will generate a proportionate increase in effective demand for industrial products – since any excess of supply over demand at existing prices will be absorbed by the commodity buffer stock. This income will be a powerful multiplier, and it will induce investment in the industrial sector, as it has found a large and reliable market for its goods in the primary sector (Hart *et al* p.164).

John Maynard Keynes famously stated that what stops us in creating positive futures is not a shortage of good ideas, but our inability to let go of the past. We need to take a fresh look at commodity buffer stocks and our system of primary production. In a world where resource security and global warming are of increasing importance and Millenium goals remain unmet, commodity buffer stocks may be a transition step towards an ICU that has bancor backed by a commodity unit, as well as offering rules for surplus countries to limit their surpluses.

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Appendix

The Commodity Buffer Stock

The commodity unit will be of standardized commodities, such as those quoted on commodity exchanges, that have a low cost of storage. The composition of this basket would be determined by international agreement; ideally, the basket would be composed of a wide range of standardized and durable commodities which are universally used, and whose values therefore, taken individually, would not be greatly changed by their use as a reserve medium. The relative proportions of the commodities in the basket would be determined by their share of world trade (periodically re-evaluated).

Table 1. **Standardized and storable commodities for possible inclusion in an international commodity reserve currency.**

Agricultural Raw Materials	**Edible Oils**	**Metals and Energy**
Cotton	Rapeseed	Copper
Wool	Canola	Zinc
Rubber	Palm Oil	Tin
Wood		Lead
Paper Pulp	**Food and Beverages**	Aluminum
	Sugar	
Wheat	Coffee	
Corn	Tea	Columbite-tantalite*
Rice	Cocoa	Natural Gas*
Soybeans	Pork bellies, frozen	Ethanol*
Oats	Orange Juice, frozen	Bio-diesel*
	Dried Milk	Carbon Permits*

*Commodities not in previous the Graham or Kaldor plans. [15]

Parity between bancor and the current market price level of the commodities in the commodity bundle should in principle be assured by arbitrage operation of private traders who would buy commodities in the open market for the purpose of tendering to the ICC*, or buy commodities form the ICC* for the purpose of tendering in the open markets whenever there is a profit in doing so (Hart et al 1964, p.156).

Under Kaldor, Bancor was pegged to gold, or in other words gold would be pegged to the commodity unit. This would be done through open market operations in gold by the ICC*. The primary commodities in the bundle should be stable in terms of gold, irrespective of variations in the exchange rate of individual currencies. Any tendency for prices to fall and the ICC* would absorb stocks of commodities, increasing bancor income to primary producers and adding to world liquidity. The opposite when prices fall.

The target basket price will be based on some historical average, e.g. past 10 years, and re-evaluated to meet the goal of a long-run stable inventory as a percentage of world trade. Kaldor suggested that commodity-reserves should grow at 3 per cent per year. This could be different

[15] The suggestion of Carbon permits comes from Lietaer (2004).

from the rate of growth of industry, but it would be a rate that brought these two sectors into balance and stabilized the terms of trade.

The common problem with issuing a new international currency is how to make it liquid enough to be used widely such that it becomes liquid. This problem does not exist for a commodity reserve currency because it is already useful, and can be taken up by the private sector and redeemed into commodities. The tables below present the use of Bancor in private sector balance sheets.

Four Different International Monetary Reserve Systems

Below are tables of balance sheet transactions for different international reserve regimes. These are overly simplified in order to give an overview of the mechanics of the different regimes. Central banks are assumed to lean against the wind in foreign exchange transactions pegging their exchange rate. There is no sterilization of domestic cash injections in what is presented here.

Examples of International Reserve transaction scenarios:

- Gold
- Bancor overdraft à la Keynes
- Bancor backed by commodities à la Graham and Kaldor
- US dollar held as US Treasuries, deposits with the Federal Reserve, plus other central bank deposits in other currencies

Terminology

Entity with red name is the initiator of a series of transactions. Transactions are put in an order of sequence, though in many cases this is purely subjective and can be rearranged. Red arrows are the direction of international reserves. Green arrows are the direction of domestic deposits or domestic bank central bank reserves.

Explanation of Tables

1.Gold Standard, no international central bank

Under the Gold standard gold could be held privately and issued privately. Capital flows in this example are controlled through central bank mediation.

A. Creation of Gold Reserves

Most gold creation was determined not so much as prices, but gold discoveries.
If a gold miner is located in a LDC then he would sell his gold to his local bank which would sell to its central bank in order to get pesos back to the gold miner. If gold is hoarded in the private

system there may not be a sale to the central bank.

B. Redistribution of Gold Reserves

A LDC firm that wants to pay back a USD denominated loan from a US bank will first have to acquire USDs from its local bank. The local bank gets dollars from the central bank which can acquire them by selling gold to the US central bank. It then effectively transfers these reserves to the US Bank. The red arrow is the movement of the international gold reserve.

C. Redistribution of Gold Reserves

A UK firm that imports manufactured goods from a US firm will first need to acquire USD deposits from its local bank. This will result in a contraction of Sterling reserves and the use of gold by the Bank of England to purchase USD reserves which it offers as deposits to its local banks. It can transfer these deposits to its counter party in the US through the banking system. Gold is held on the books at the Federal Reserve and USD reserves are expanded.

2. Bancor à la Keynes, International Clearing Union (ICU) and International Commod Control (ICC).

Bancor was fixed in terms of gold, dollars and pounds but adjustable. Countries would adopt a fixed rate but could apply to the ICU for modification. The quota limit for both deficit and surplus countries was (total imports + total exports)/2 for a year. (There was no limit on surplus countries in the 1942 proposal). Interest is charged at 1% on credit or debit Bancor balances in excess of 25% of quota on average. This increases-to 2% when 50% of quota is reached. However any member state in deficit could borrow from a surplus state, and then both would avoid theses expenses. A deficit country that is allowed to increase its quota by more than 50% may also have to devalue its currency. Great than 75% and it will be declared in default and no long have access to its account. Surplus countries in excess of 50% will have to either: expand domestic credit and demand, appreciate its currency in terms of bancor, increase money wages, reduce excess tariffs on imports, offer international loans to developing countries.

Countries can come to the ICU to borrow Bancor with no conditionality.
Bancor reserves are only held on the books of central banks, which they can use to back the creation of their own domestic currency. Central banks enforce foreign currency capital controls.

A. Creation of Bancor

Keynes' model of Bancor was an overdraft system but new issues of Bancor could be produced by ~~the~~ selling gold to the ICU. While gold could be redeemed for Bancor, Bancor could not be redeemed for gold.

B. Creation of Bancor

Bancor is also created by crediting Bancor reserve assets to the LDC central bank. If a farmer

wishes to import manufactured goods from China then it must first acquire Yuan de~~s~~posits. Since capital flows are controlled by central banks, the local bank must go to its central bank to get Yuan. The local bank buys Yuan from the Chinese central bank with Bancor. This Bancor is lent to the LCD by the ICU. In the process of trade, Bancor is transferred from the importing country to the exporting country.

C. Creation of Bancor

The ICC under Keynes can also readily borrow to stabilize individual commodity prices.
The ICC will price commodities in Bancor. By buying commodities it will create Bancor, though payments must be held in local currencies by the farmers or commodity exchanges. Hence Bancor ends up in the accounts of the local central bank.

D. Redistribution of Bancor

A Chinese firm that has a surplus of Bancor over 100% of its quota will have it confiscated. Hence the incentive is to use it either in buying imports or in FDI. In this case we show FDI by a Chinese investor into a LDC farm~~er~~. The Chinese investor will first need to acquire peso deposits by going to his bank, which goes to the central bank. The Chinese central bank will sell Bancor for Peso deposits from the LDC central bank. The Chinese investor will exchange his Peso deposits for equity in a LDC farm.

3. Commodity Bancor à la Graham-Kaldor, and International Commodity Corporation (ICC*).

Under Kaldor's model Bancor could be held privately and issued privately. It is 100 percent backed by commodities which we call Commod as with Keynes, but in this case each commod is a basket of 30-60 commodities in quantities that reflect their relative importance in world production and trade. They would be standardized commodities with appropriate inventory management to minimize spoilage. The commodity unit or index is stabilized in relation to market prices in terms of USD or whatever the denomination of the trading price.

A. Creation of Bancor

Bancor is created when commodities in the bufferstock increase, usually during a decline in commodity prices. The farmer will sell to the highest bidder which may be the ICC. While the ICC only buys baskets of inventories, middlemen, futures exchanges, etc would be ready to bundle baskets for sale. The farmer (if receiving cash) would get the going price for his product. If he chose to receive Bancor by selling a basket then he would then want to exchange this Bancor for local currency at his national bank. To the extent that the Bank requires more reserves to complete this request the local central bank will buy Bancor.

B. Destruction of Bancor

A Chinese Firm that requires commodities could purchase them from the ICC if they are selling for Bancor. The Chinese firm would exchange its Yuan deposits for Bancor at its Bank. The Bank will go to the market for Bancor in exchange for Yuan. To the extent that the Chinese central Bank is

pegging the exchange rate it may choose to sell Bancor for Yuan. The red arrows describe the movement of Bancor from the Chinese central bank to the ICC, resulting in a reduction of total Bancor outstanding.

C. Redistribution of Bancor

A Chinese investor may acquire Bancor from his local bank, who could acquire it from his central bank, to invest in a commodity producing LDC. The farm or firm in the LDC will want to exchange this Bancor into local currency with its bank which can exchange it with its central bank. Thus foreign direct~~ion~~ investment redistributes Bancor from one country to another.

4. US Dollar Standard, no international central bank

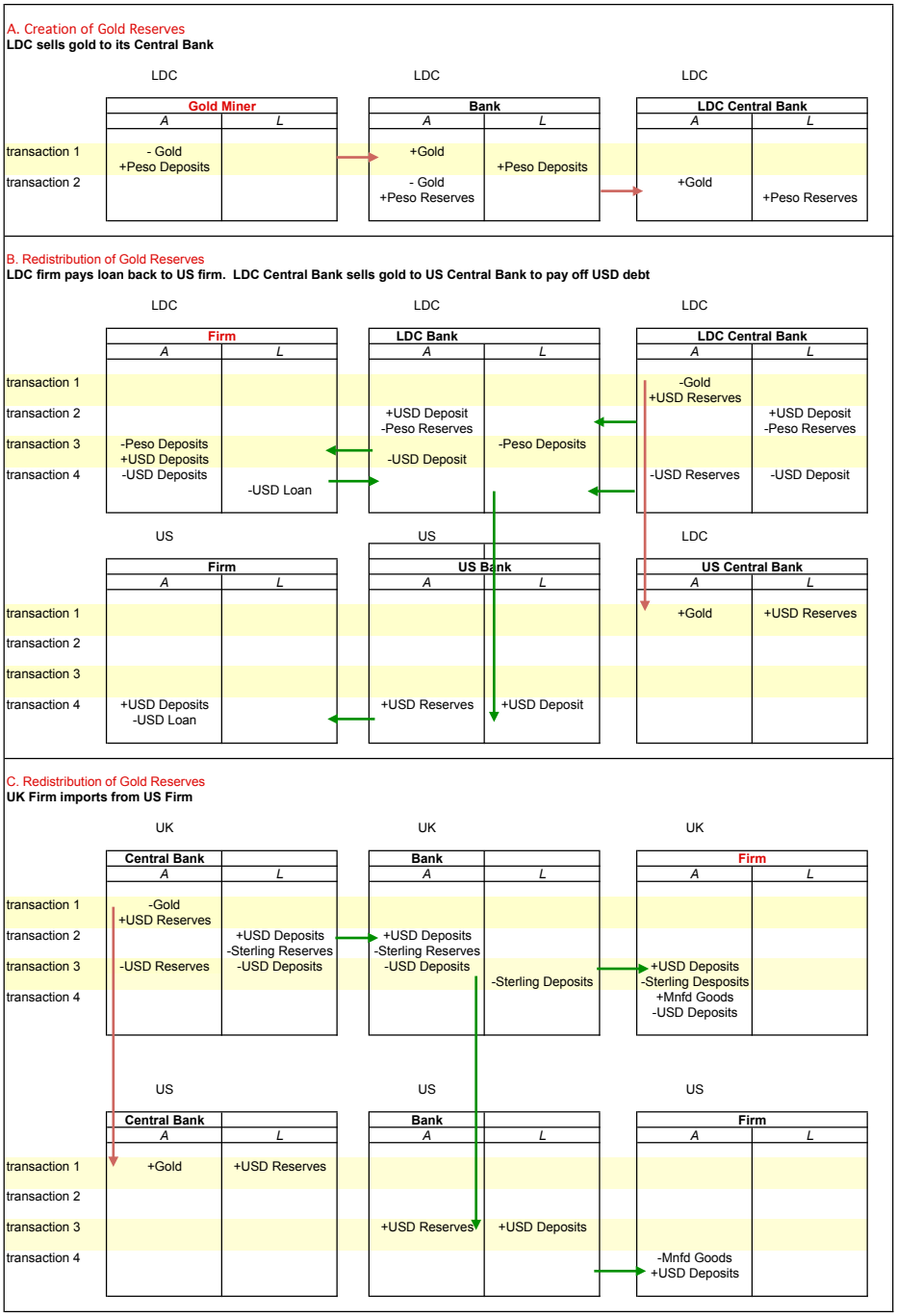
A. Creation and Recycling of International Reserves – US Trade Deficit

The creation of international USD reserves through a trade surplus in Germany begins with a US firm purchasing manufactured goods from a German firm with USD deposits. We assume that the German firm can have a USD denominated account with the foreign branch of a US bank. At this point there are no international reserves yet created, as the reserves are still on the books of the US parent bank. Once the German firm exchanges into Euro's instead of dollars, then the Foreign Branch will go into the market for Euros selling USD deposits and appreciating Euros/USD. If the central bank chooses to peg their exchange rate they will buy foreign exchange and sell Euro reserves. In the table the injection of Euros is not sterilized (bought back with government bonds). Even with flexible exchange rates the central bank usually leans against the wind and accumulates USD reserves over time. Now international reserves have been created, transferred from the US parent bank to the German central bank in Transaction 2. These USD reserves are usually held in the form of US Treasury Bills, providing short term capital inflow back into the US replacing the initial loss of bank reserves. The sovereign flow back into the US can also occur through a German sovereign wealth fund into US private securities. The recycling of reserves can be unlimited (ignoring capital constraints), building up international reserves and US debt.

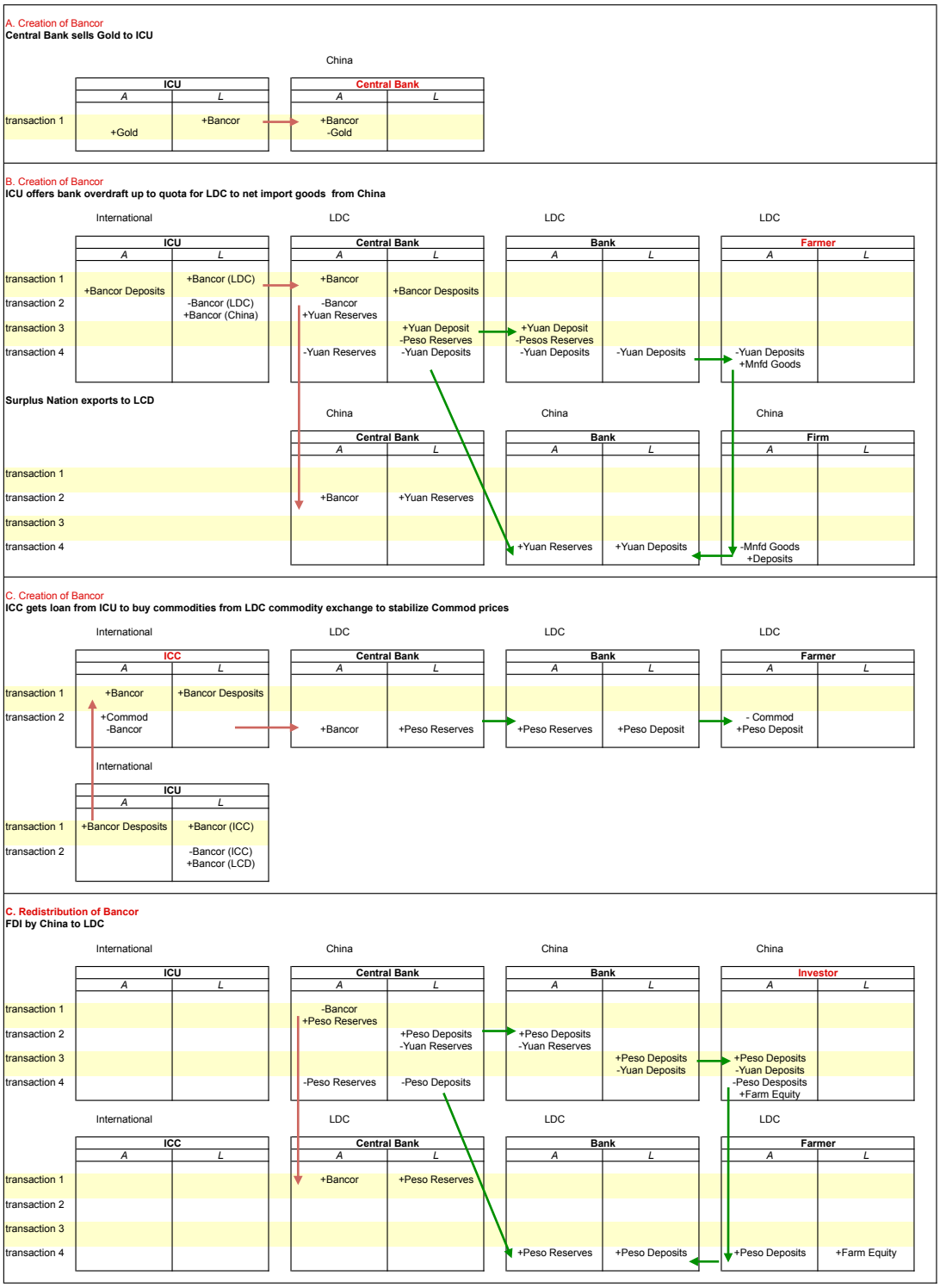
B. Recycling of USD capital flows – US FDI

In this scenario US bank borrowing comes through the discount window or open market operations of the US central bank, increasing overall domestic reserves. The bank finances the US firm's desire to invest in manufacturing overseas. Again the German firm has USD deposits in Germany with a US foreign branch of a US bank. These funds could ultimately be converted into Euros or be recycled back and forth between nations in the private sector capital markets. For example, the German firm could exchange its USD deposits for US commercial paper, just as the US bank might do. By buying this (or any other corporate commercial paper) the US bank with the new cash funds (or new deposits) can pay back its short term loan from the Federal Reserve. In this particular scenario there are no international reserves created, but since this is an unlimited loop (ignoring capital or reserve requirements) at steps during this process official foreign USD reserves will be created if Euro deposits are desired.

Gold Standard, no international central bank



Bancor à la Keynes, International Clearing Union (ICU) and International Commod Control (ICC)



Commodity Bancor à la Graham and Kaldor, with the International Commodity Corporation (ICC). In this example Bancor is allowed to trade privately.

A. Creation of Bancor

LDC farmer sells Commod to ICF for Bancor which is sold to the Bank and then to Central Bank

	International	LDC	LDC	LDC
	ICC*	**Farmer**	**Bank**	**Central Bank**
	A / *L*	*A* / *L*	*A* / *L*	*A* / *L*
transaction 1	+Commod / +Bancor	- Commod +Bancor		
transaction 2		-Bancor +Bancor Deposit	+Bancor / +Bancor Deposit	
transaction 3		-Bancor Deposit +Peso Deposit	-Bancor +Peso Reserves / -Bancor Deposit +Peso Deposit	+Bancor / +Peso Reserves

B. Destruction of Bancor

Chinese Manufacturer buys Commod from ICF

	China	China	China	International
	Central Bank	**Bank**	**Frim**	**ICC**
	A / *L*	*A* / *L*	*A* / *L*	*A* / *L*
transaction 1	-Bancor / -Yuan Reserves	+Bancor -Yuan Reserves -Bancor		
transaction 2		-Yuan Deposits	+Bancor -Yuan Deposits -Bancor +Commod	
transaction 3				-Commod / -Bancor

C. Redistribution of Bancor

US Importer buys manfactured goods from China using Bancor

	International	US	US	US
	ICC*	**Central Bank**	**Bank**	**Retailer**
	A / *L*	*A* / *L*	*A* / *L*	*A* / *L*
transaction 1		-Bancor / -USD Reserves	+Bancor -USD Reserves -Bancor	
transaction 2			-USD Deposits	+Bancor -USD Deposits -Bancor +Mnfd Goods
transaction 3				
transaction 4				

	China	China	China
	Central Bank	**Bank**	**Firm**
	A / *L*	*A* / *L*	*A* / *L*
transaction 1			
transaction 2			
transaction 3			+Bancor -Mnfd Goods
transaction 4		+Bancor / +Bancor Deposits	-Bancor +Bancor Deposits
transaction 5	+Bancor / +Yuan Reserves	-Bancor +Yuan Reserves / -Bancor Deposits +Yuan Deposits	-Bancor Deposits +Yuan Deposits

C. Redistribution of Bancor

FDI by China to LDC

	International	China	China	China
	ICC*	**Central Bank**	**Bank**	**Investor**
	A / *L*	*A* / *L*	*A* / *L*	*A* / *L*
transaction 1		-Bancor / -Yuan Reserves	+Bancor -Yuan Reserves -Bancor	
transaction 2			-Yuan Deposits	+Bancor -Yuan Deposits -Bancor +Farm Equity
transaction 3				
transaction 4				

	LDC	LDC	LDC
	Central Bank	**Bank**	**Farmer**
	A / *L*	*A* / *L*	*A* / *L*
transaction 1			
transaction 2			
transaction 3			+Bancor / +Farm Equity
transaction 4		+Bancor / +Bancor Deposits	-Bancor +Bancor Deposits
transaction 5	+Bancor / +Peso Reserves	-Bancor +Peso Reserves / -Bancor Deposits +Peso Deposits	-Bancor Deposits +Peso Deposits

Dollar Standard, no international central bank

A. Creation and Recycling of International USD Reserves - US Trade Deficit

US Firm imports from German Firm manufactured goods. German Firm has USD and Euro deposits at US Foreign Branch

US

Firm		
	A	*L*
transaction 1	+Mnfd Goods -USD Deposits	
transaction 2		
transaction 3		

US

Bank		
	A	*L*
transaction 1		+USD Deposits (Parent/Branch) -USD Deposits (US Firm)
transaction 2	-USD Reserves	-USD Deposits (Parent/Branch)
transaction 3		

US

Treasury		
	A	*L*
transaction 1		
transaction 2		
transaction 3	+USD Reserves	+US Treasury Bill

German Firm exports goods to US receiving USD Depsosits converted into Euro Deposits

Germany

Firm		
	A	*L*
transaction 1	+USD Deposits -Mnfd Goods	
transaction 2	-USD Deposits +Euro Deposits	
transaction 3		

Germany

US Bank Foreign Branch		
	A	*L*
transaction 1	+USD Deposits (Parent/Branch)	+USD Deposits
transaction 2	-USD Deposits (Parent/Branch) +Euro Reserves	-USD Deposits +Euro Deposits
transaction 3		

Europe

Central Bank		
	A	*L*
transaction 1		
transaction 2	+USD Reserves	+Euro Reserves
transaction 3	-USD Reserves +US Treasury Bill	

B. Recycling USD capital flows -US FDI

Recycling of US Firm FDI into German Firm and back to US

US

Firm		
	A	*L*
transaction 1		
transaction 2	+USD Deposits	+Long Term Loan
transaction 3	-USD Deposits +German Equity	
transaction 4		
transaction 5		

US

Bank		
	A	*L*
transaction 1	-Repo T-Bill +USD Reserves	
transaction 2	+Long Term Loan	+USD Desposits
transaction 3		-USD Deposits +USD Deposits (Parent/Branch)
transaction 4		-USD Deposits (Parent/Branch) +US Commercial Paper
transaction 5	+Repo T-Bill -USD Reserves	

US

Central Bank		
	A	*L*
transaction 1	+Repo T-Bill	
transaction 2		+USD Reserves
transaction 3		
transaction 4		
transaction 5	-Repo T-Bill	-USD Reserves

Germany

Firm		
	A	*L*
transaction 1		
transaction 2		
transaction 3	+USD Deposits	+German Equity
transaction 4	-USD Deposits +US Commercial Paper	
transaction 5		

Germany

US Bank Foreign Branch		
	A	*L*
transaction 1		
transaction 2		
transaction 3		+USD Deposits
transaction 4	+USD Deposits (Parent/Branch) -USD Deposits (Parent/Branch)	-USD Deposits
transaction 5		

Europe

Central Bank		
	A	*L*
transaction 1		
transaction 2		
transaction 3		
transaction 4		
transaction 5		