Appendix A
Inflation Example

Barter Economy

It is difficult to understand inflation in a multi-trillion dollar economy. A small and developing mini-economy sheds more light on the topic. In the first iteration of this economy, people barter for everything. The only method of conducting economic transactions is by trading one's production for another's. Our mini-economy consists of the following persons:

i. Person "A" produces apples

ii. Person "B" produces bananas

iii. Person "C" produces corn

iv. Person "S" provides labor to produce any crop

The Wealth Exchange Table (Table A-1) defines the barter arrangements between people.

- One (1) apple is exchanged for three (3) bananas.
- One (1) apple is exchanged for 1/3 bushel of corn or 3 apples are exchanged for one bushel of corn

- One (1) banana is exchanged for 1/3 of an apple or 3 bananas are exchanged for 1 apple.
- One (1) banana is exchanged for 1/9 of bushel of corn or 9 bananas are exchanged for 1 bushel of corn.
- One unit of labor is exchangeable for 3 apples, 9 bananas, and 1 bushel of corn.

	Apples (qty)	Bananas (qty)	Corn (bushel)	Labor (hrs)
Apples	N/A	3	1/3	1/3
Bananas	1/3	N/A	1/9	1/9
Corn	3	9	N/A	1
Labor	3	9	1	N/A

Table A-1

The relationships could change. For example, a shortage of bananas could arise due to acts of nature. The result might be a 1:1 exchange of apples to bananas for a period while the shortage existed. This is in contrast to the normal ratio of 3 bananas to 1 apple.

What happens when one person desires to consume more than they are capable of exchanging? Person B (producer of bananas) wishes to consume more corn but does not have enough bananas with which to pay Person C (producer of corn). Person B requests a corn loan from Person C. Person C gives Person B an additional bushel of corn as a loan payable in one month. For this transaction, C wants more than the 9 bananas (see Wealth Exchange Table) that is the typical exchange. Person C wants 12 bananas.

How does B pay back C for the extra bushel of corn? The payment is via additional bananas that B produces (surplus) in the future. Person B has rented the surplus corn from C and the rental fee is the surplus banana production in the future. Person B has exchanged present consumption (corn) for future production (bananas). C has deferred consuming corn now in exchange for a greater number of bananas in the future. C gains 3 more bananas than the regular exchange rate (9 bananas for 1 bushel of corn) by demanding 12 bananas in the future. The table below summarizes this transaction.

Person	**Consumed Now**	**Given Now**	**Paid in Future**	**Received in Future**
B	1 bushel corn	Nothing	12 bananas	N/A
C	N/A	1 bushel of corn	N/A	12 bananas

Table A-2

In this mini-economy, anyone wishing to consume more now must save their production in the future in order to pay back what they consumed. This point is vital to understand.

Person B could not have consumed the extra corn without saving bananas in the future with which to pay back Person C.

The items in the Wealth Exchange System table are wealth since human effort produces them, or in the case of labor, it is human effort [(1)]. The items also have exchange value. There is no inherent inflation in this mini-economy. The only way to increase your wealth in this mini-economy is to produce more, consume less, or some combination thereof. Individual wealth increases with surplus production. Let me repeat this, "Individual wealth increases with surplus production."

[(1)] Some may not consider labor as wealth but rather a factor of production. For the purposes of this example, we will consider labor as wealth.

Wealth Money

A new Person enters the economy, Person "G", and produces gold coins of different weights. All Persons in the mini-economy agree to relationships between their product and the gold coin. These gold coins represent a medium of exchange, a unit of account, and a store of wealth. Why are these gold coins money? They are definitely a medium of exchange since all Persons (A,B, C, S, G) will use them. They are a unit of account since we indicated the coins have different sizes and values. They are a store of wealth since it is a material item produced by human effort.

The relationship between the perishable products and labor retain the same values to one another, only now the gold coin is the money representing the value.

The Wealth Exchange table retains the same relationships between the crops and the labor. For example, (1) apple formerly was exchanged for (3) bananas. This is the same as saying (30) apples equals (90) bananas (multiply the quantities by 30).

	Apples (qty)	**Bananas (qty)**	**Corn (bushel)**	**Labor (hrs)**
Gold Coin (oz)	30	90	10	10

Table A-3

The new Wealth Exchange System table clearly indicates that 1 oz of the gold coin equals either 30 apples or 90 bananas – meaning 30 apples = 90 bananas.

Now, there is a more convenient means of exchange, the gold coins. The gold coins provide a reference to every item in this mini-economy. Inflation is not present in this economy even after the introduction of the gold coins. Why? Because the coins are real wealth.

As before, a shortage of bananas will result in fewer bananas exchangeable for an ounce of gold. The price increase is temporary and is a result of acts of nature – not money inflation. If production of bananas is permanently impaired, then the relationship between gold and bananas will change. The "price" of bananas increased but it was not because the value of the money decreased.

Consider the last sentence carefully. The new medium of exchange does not cause inflation by itself. Acts of nature or other events are capable of creating upward price changes. A new method of producing bananas could introduce more efficiencies making banana production more abundant. Such efficiencies should drive the price of bananas down, which is a good thing.

What if the supply of gold coins increased and everything else held constant? In this case, each ounce of gold coin purchases fewer apples, bananas and corn since the supply of coins increased relative to the other items. While one may consider this gold coin inflation, there had to be additional effort expended in order to increase the supply of coins or perhaps coin production became more efficient. The coins still represent wealth even if produced in greater quantities. The greater quantities of coins simply mean more of them are required to purchase the apples, bananas, corn, and labor.

Inflation Example

What happens if Person "P" appears and convinces the people that a barter system is not practical and that the supply of gold coins is not sufficient to grow their mini-economy? A law is passed requiring paper notes be used in the transactions. Person P creates paper notes that say "***Good as One Ounce of Gold***".

The rest of the people in the mini-economy accept paper notes and treat it just like a one-ounce gold coin. It requires <u>little effort</u> to produce this paper, compared to gold coins or anything else. Person P can produce paper notes at will. When P brought this paper into the mini-economy, it became easy for P to acquire gold, apples, bananas, corn and labor. Soon the producers of the crops and the providers of the labor find that there are fewer items available since Person P is acquiring them. This causes them to demand more paper for their own products since they need more paper to buy the other things in the economy.

The people in the economy begin to request loans from Person P since they find themselves short of paper notes. Person P loans paper notes and requests the same value of paper notes plus interest in return. The paper notes only come into existence by Person P printing them. The interest payments on the loans require more paper notes to be printed. The amount of paper notes in circulation begins to increase even more.

While this is occurring, the gold coins fall out of circulation since the participants in the economy begin to recognize their wealth is superior relative to the paper notes. Even though people were told the paper note and the gold coins were worth the same, instinctively they knew otherwise. Rather than exchanging a single paper note for a gold coin, the people demand 100 paper notes now for the gold coin. People begin to say that the "price" of the gold coin has gone up since originally, it was exchanged 1:1 with the paper note and now it is 100:1 paper to gold.

The effect of paper note introduction was inflation. Prior to paper note introduction, prices were stable. Only acts of nature or increases in efficiency disrupted pricing. Now, prices increased merely with the introduction of paper notes. It is not merely that the notes were made of paper. What is important is that nobody believed the paper was a good as one ounce of gold.

Paper vs. Gold Coins

Did the act of having paper in the mini-economy by itself cause inflation? No. If a fixed amount of paper existed in the economy relative to a fixed amount of gold coin, the paper would be a certificate or receipt for the gold. Person P did not introduce the paper notes as a receipt for the gold. P simply indicated that anyone who had the paper note commanded the same purchasing power as gold. Once more paper got introduced into the economy, it allowed the paper holder to buy more apples, bananas, and corn.

It would be no different if the producer of apples suddenly found a way to grow apples at will. They could exchange their infinite supply of apples for more corn, bananas, labor or gold coins. This is an exaggeration since people can only eat and store so many apples. Since the paper was the medium of exchange, everyone needed it and paper is not perishable like apples.

Mini-Economy Example Recap

Initially, the economy functioned using only barter. Relationships of one product to another were established. No inflation, as we know it, existed. The barter economy was cumbersome and at times impractical since many of the goods produced were perishable.

Gold coins introduced a new level of economic functionality. The gold coins satisfied the definition of money and people exchanged their goods for coins. Changes in price resulted from acts of nature or by increases in efficiency. The former increased prices and the latter reduced them.

The introduction of paper notes, *declared equivalent to gold coins*, had an immediate inflationary effect on the economy. Suddenly all prices went up. People accepted the notes since they assumed they were as good as gold. Initial confidence in the paper was not an issue. Over time, gold coins vanished from circulation (Gresham's Law). The price of the gold coin itself went from a 1:1 relationship with paper notes to 100:1 (paper notes to gold coin). Loans, requiring payment in notes for the principal and interest emerged. The interest to pay the loans originated with Person P who was the only source of notes.