

Betreff: [New post] Samuelson Rules the Seas

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Datum: 14.03.2017 21:15

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New post on **Uneasy Money**



Samuelson Rules the Seas

by David Glasner

I think Nick Rowe is a great economist; I really do. And on top of that, [he recently has shown himself to be a very brave economist](#), fearlessly claiming to have shown that Paul Samuelson's classic 1980 takedown ("[A Corrected Version of Hume's Equilibrating Mechanisms for International Trade](#)") of David Hume's classic 1752 articulation of the price-specie-flow mechanism (PSFM) ("[Of the Balance of Trade](#)") was all wrong. Although I am a great admirer of Paul Samuelson, I am far from believing that he was error-free. But I would be very cautious about attributing an error in pure economic theory to Samuelson. So if you were placing bets, Nick would certainly be the longshot in this match-up.

Of course, I should admit that I am not an entirely disinterested observer of this engagement, because in the early 1970s, long before I discovered the Samuelson article that Nick is challenging, [Earl Thompson](#) had convinced me that Hume's account of PSFM was all wrong, the international arbitrage of tradable-goods prices implying that gold movements between countries couldn't cause the relative price levels of those countries in terms of gold to deviate from a common level, beyond the limits imposed by the operation of international commodity arbitrage. And Thompson's reasoning was largely restated in the ensuing decade by Jacob Frenkel and Harry Johnson ("The Monetary Approach to the Balance of Payments: Essential Concepts and Historical Origins") and by Donald McCloskey and Richard Zecher ("[How the Gold Standard Really Worked](#)") both in the 1976 volume on [The Monetary Approach to the Balance of Payments](#) edited by Johnson and Frenkel, and by David Laidler in his essay "[Adam Smith as a Monetary Economist](#)," explaining why in *The Wealth of Nations* Smith ignored his best friend Hume's classic essay on PSFM. So the main point of Samuelson's takedown of Hume and the PSFM was not even original. What was original about Samuelson's classic article was his dismissal of the rationalization that PSFM applies when there are both non-tradable and tradable goods, so that national price levels can deviate from the common international price level in terms of tradables, showing that the inclusion of tradables into the analysis serves only to slow down the adjustment process after a gold-supply shock.

So let's follow Nick in his daring quest to disprove Samuelson, and see where that leads us.

Assume that durable sailing ships are costly to build, but have low (or zero for simplicity) operating costs. Assume apples are the only tradeable good, and one ship can transport one apple per year across the English Channel between Britain and France (the only countries in the world). Let P be the

price of apples in Britain, P^ be the price of apples in France, and R be the annual rental of a ship, (all prices measured in gold), then $R=ABS(P^*-P)$.*

I am sorry to report that Nick has not gotten off to a good start here. There cannot be only tradable good. It takes two tango and two to trade. If apples are being traded, they must be traded for something, and that something is something other than apples. And, just to avoid misunderstanding, let me say that that something is also something other than gold. Otherwise, there couldn't possibly be a difference between the Thompson-Frenkel-Johnson-McCloskey-Zecher-Laidler-Samuelson critique of PSFM and the PSFM. We need at least three goods – two real goods plus gold – providing a relative price between the two real goods and two absolute prices quoted in terms of gold (the numeraire). So if there are at least two absolute prices, then Nick's equation for the annual rental of a ship R must be rewritten as follows $R=ABS[P(A)^*-P(A)+P(SE)^*-P(SE)]$, where $P(A)$ is the price of apples in Britain, $P(A)^*$ is the price of apples in France, $P(SE)$ is the price of something else in Britain, and $P(SE)^*$ is the price of that same something else in France.

OK, now back to Nick:

In this model, the Law of One Price ($P=P^*$) will only hold if the volume of exports of apples (in either direction) is unconstrained by the existing stock of ships, so rentals on ships are driven to zero. But then no ships would be built to export apples if ship rentals were expected to be always zero, which is a contradiction of the Law of One Price because arbitrage is impossible without ships. But an existing stock of ships represents a sunk cost (sorry) and they keep on sailing even as rentals approach zero. They sail around Samuelson's Iceberg model (sorry) of transport costs.

This is a peculiar result in two respects. First, it suggests, perhaps inadvertently, that the law of price requires equality between the prices of goods in every location when in fact it only requires that prices in different locations not differ by more than the cost of transportation. The second, more serious, peculiarity is that with only one good being traded the price difference in that single good between the two locations has to be sufficient to cover the cost of building the ship. That suggests that there has to be a very large price difference in that single good to justify building the ship, but in fact there are at least two goods being shipped, so it is the sum of the price differences of the two goods that must be sufficient to cover the cost of building the ship. The more tradable goods there are, the smaller the price differences in any single good necessary to cover the cost of building the ship.

Again, back to Nick:

Start with zero exports, zero ships, and $P=P^$. Then suppose, like Hume, that some of the gold in Britain magically disappears. (And unlike Hume, just to keep it simple, suppose that gold magically reappears in France.)*

Uh-oh. Just to keep it simple? I don't think so. To me, keeping it simple would mean looking at one change in initial conditions at a time. The one relevant change – the one discussed by Hume – is a reduction in the stock of gold in Britain. But Nick is looking at two changes -- a reduced stock of gold in Britain *and* an increased stock of gold in France --

simultaneously. Why does it matter? Because the key point at issue is whether a national price level – i.e, Britain's -- can deviate from the international price level. In Nick's two-country example, there should be one national price level and one international price level, which means that the only price level subject to change as a result of the change in initial conditions should be, as in Hume's example, the British price level, while the French price level – representing the international price level – remained constant. In a two-country model, this can only be made plausible by assuming that France is large compared to Britain, so that a loss of gold could potentially affect the British price level without changing the French price level. Once again back to Nick.

The price of apples in Britain drops, the price of apples in France rises, and so the rent on a ship is now positive because you can use it to export apples from Britain to France. If that rent is big enough, and expected to stay big long enough, some ships will be built, and Britain will export apples to France in exchange for gold. Gold will flow from France to Britain, so the stock of gold will slowly rise in Britain and slowly fall in France, and the price of apples will likewise slowly rise in Britain and fall in France, so ship rentals will slowly fall, and the price of ships (the Present Value of those rents) will eventually fall below the cost of production, so no new ships will be built. But the ships already built will keep on sailing until rentals fall to zero or they rot (whichever comes first).

So notice what Nick has done. Instead of confronting the Thompson-Frenkel-Johnson-McCloseky-Zecher-Laidler-Samuelson critique of Hume, which asserts that a world price level determines the national price level, Nick has simply begged the question by not assuming that the world price of gold, which determines the world price level, is constant. Instead, he posits a decreased value of gold in France, owing to an increased French stock of gold, and an increased value of gold in Britain, owing to a decreased British stock of gold, and then conflating the resulting adjustment in the value gold with the operation of commodity arbitrage. Why Nick thinks his discussion is relevant to the Thompson-Frenkel-Johnson-McCloseky-Zecher-Laidler-Samuelson critique escapes me.

The flow of exports and hence the flow of specie is limited by the stock of ships. And only a finite number of ships will be built. So we observe David Hume's price-specie flow mechanism playing out in real time.

This bugs me. Because it's all sorta obvious really.

Yes, it bugs me, too. And, yes, it is obvious. But why is it relevant to the question under discussion, which is whether there is an international price level in terms of gold that constrains movements in national price levels in countries in which gold is the numeraire. In other words, if there is a shock to the gold stock of a small open economy, how much will the price level in that small open economy change? By the percentage change in the stock of gold in that country – as Hume maintained – or by the miniscule percentage change in the international stock of gold, gold prices in the country that has lost gold being constrained from changing by more than allowed by the cost of arbitrage operations? Nick's little example is simply orthogonal to the question under discussion.

I skip Nick's little exegetical discussion of Hume's essay and proceed to what I think is the final substantive point that Nick makes.

Prices don't just arbitrage themselves. Even if we take the limit of my model, as the cost of building ships approaches zero, we need to explain what process ensures the Law of One Price holds in equilibrium. Suppose it didn't...then people would buy low and sell high.....you know the rest.

There are different equilibrium conditions being confused here. The equilibrium arbitrage conditions are not same as the equilibrium conditions for international monetary equilibrium. Arbitrage conditions for individual commodities can hold even if the international distribution of gold is not in equilibrium. So I really don't know what conclusion Nick is alluding to here.

But let me end on what I hope is a conciliatory and constructive note. As always, Nick is making an insightful argument, even if it is misplaced in the context of Hume and PSFM. And the upshot of Nick's argument is that transportation costs are a function of the dispersion of prices, because, as the incentive to ship products to capture arbitrage profits increases, the cost of shipping will increase as arbitrageurs bid up the value of resources specialized to the processes of transporting stuff. So the assumption that the cost of transportation can be treated as a parameter is not really valid, which means that the constraints imposed on national price level movements are not really parametric, they are endogenously determined within an appropriately specified general equilibrium model. If Nick is willing to settle for that proposition, I don't think that our positions are that far apart.

David Glasner | March 14, 2017 at 1:15 pm | Tags: [David Laidler](#), [Donald McCloskey](#), [Harry Johnson](#), [Jacob Frenkel](#), [Richard Zecher](#) | Categories: [David Hume](#), [Earl Thompson](#), [gold standard](#), [Nick Rowe](#), [price-specie-flow mechanism](#), [Samuelson](#) | URL: <http://wp.me/p1FaNi-14M>

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