Fekete's Arbitrage Fallacy

by Tom Fischer
December 09, 2013

This essay analyzes the definition and the use of the notion "arbitrage" in Antal E. Fekete's writings and comes to the conclusion that they are flawed and misleading. For instance, Fekete and his followers have repeatedly stated that backwardation in gold forward contracts should theoretically be impossible as this constituted an arbitrage opportunity. However, this statement is wrong under the generally accepted definition of arbitrage, as well as it is wrong under Fekete's own version of the notion. Whether and how much the problematic definition affects other parts of Fekete's work in economics, is not a topic of this article. However, this essay should serve as a warning to investors and researchers who rely on the writings of Fekete or his fellow "New Austrians" – particularly also with regards to the gold basis –, that not all is right in Fekete's theories.

In his essays touching on arbitrage in general and on backwardation in gold in particular, Antal E. Fekete has done something which is not very obvious to the untrained eye, but therefore possibly even more confusing and dangerous. His mistake is akin to someone who has decided that the notion of "gold" was too narrow when only used for actual gold, so, to generalize and broaden the concept, any other metal should be called "gold" as well. I assume the reader would agree that this would be a bad idea and might lead to confusion and a series of wrong conclusions as well. For instance – and Fekete does something very similar which will be explained below – one could now be tempted to claim that, since it had always been so, all "gold" should be yellow metal. But because some of the new "gold" apparently was not yellow, this was a sign of something in the "gold" market being foul. To be more specific, Fekete has abused the notion of "arbitrage" in his work on Austrian and "New Austrian" economics. In mathematical finance, "arbitrage" has a well-known and very precise meaning, which says, that it is a trading strategy that outperforms the risk-free rate of interest. In other words, arbitrage is a trade or strategy that is too good to be true. At some stage (references follow below), however, Fekete seems to have decided that any(!) other economic transaction constituted an "arbitrage" as well. So, drawing the comparison to our example, any other metal suddenly became "gold", too. Where this logic finally had to go wrong, will be explained in the remainder.

Arbitrage: "money out of nothing"

To expand on the generally accepted definition that arbitrage in any currency is an investment that outperforms the risk-free rate of interest in that currency, assume now that we can invest, but also borrow, at the risk-free rate (as any borrower needs a lender, and vice versa). Under arbitrage conditions, this means that if an investor does not have any capital to start with, she can borrow money at the risk-free rate and then outperform the loan's interest using the arbitrage strategy. At the end, she pays back the loan while she can keep the profits she made on top of the risk-free return. She hence "made money out of nothing", or, as they say, she found a "free lunch".

Arbitrage: independent of personal preferences

An important property of arbitrage is that its existence does not depend on personal preferences or the "numeraire", that is the currency used to account for wealth. If an arbitrage opportunity is present, then it exists and is desirable for everyone, i.e. for all market participants. Since for everyone some money is better than none, all market participants would benefit from running the same arbitrage strategy if they could, independent of their particular personal preferences. Furthermore, if an arbitrage was present (or if it was not present) if we counted our wealth in

Dollars, it would also be present (or not present) if we counted our wealth, for instance, in ounces of gold, or any other currency or good. Hence, the numeraire does not matter.

Arbitrage will be "arbitraged away"

We had seen that arbitrage is a trade or strategy that, essentially, is too good to be true. Therefore, as professional "arbitrageurs" would seek out such strategies and would follow through with them, they should generally not exist, or not exist for long. As an example, a typical arbitrage is when a good can be bought and sold at two different prices. Buying low and selling high at the same time is the arbitrage, but if everyone tries to do that, sellers and buyers will soon be overwhelmed by demand and supply, respectively, and prices will converge, such that any profits would finally disappear. The arbitrage would "close" or "be arbitraged away". So, especially the property that arbitrage is desirable for everyone independent of their personal preferences ensures that people will try to realize arbitrage and, in due course, the arbitrage will disappear.

Fekete's arbitrage: barter, purchase, anything

In his article "Disequilibrium Analysis of Price Formation. Disorder and coordination in economics" (reference [1]), Fekete explains his own idea of arbitrage:

> *Whether recognized or not, arbitrage is the driving force of the market process. It is present in every market action, even though sometimes it may well be hidden. It is not generally recognized that barter — a sale and a purchase 'telescoped' into a single transaction — is an instance of arbitrage. By the same token so is every purchase, since an explicit choice always incorporates the implicit rejection of the nearest alternative.*

In Fekete's own words, "barter" is arbitrage and "every purchase" too, so essentially, any transaction or "every market action", as he formulates it. Given the earlier outlined generally accepted meaning of arbitrage outside Fekete's and his disciples' work, this statement is absolutely wrong. To someone trained in financial mathematics, it is comparable to the statement "gold is gold, and every other metal in the world is gold, too". So, to make a very clear distinction to the commonly used proper definition of arbitrage, we will call Fekete's version from now on a "Fekete-arbitrage". However, note that Fekete's "arbitrage" notion includes the proper standard notion (as it includes every market action, so it also includes proper arbitrage strategies). Therefore, we shall call a Fekete-arbitrage, that is not a proper arbitrage in the generally accepted sense, a "Fekete-only-arbitrage".

Fekete-only-arbitrage cannot be "arbitraged away"

According to Fekete's definition, if someone buys herself lunch, i.e. exchanges cash for lunch and hence prefers lunch over cash, this constitutes an "arbitrage". I predict that this "arbitrage" will not be "arbitraged away" anytime soon – unless we all wanted to starve ourselves around noon. Also, this someone's friend, who joins her over lunchtime, might have had her lunch already and would momentarily not have the slightest inclination to buy a second lunch. So, the friend clearly would prefer cash over food and, hence, would not transact. Buying lunch therefore is no proper arbitrage, it is a Fekete-only-arbitrage. It is dependent on personal preference and will therefore never "close". We can also conclude that it is certainly not true that something in the "lunch market" is fishy just because this Fekete-only-arbitrage exists.

Proper arbitrage in comparison

Now, in contrast, consider a real arbitrage in the literal sense of a "free lunch". Our hungry protagonist would certainly pursue this arbitrage. However, so would her friend who is not hungry at all. Here is why: If the not-so-hungry friend knew about where to get a delicious free lunch, she could offer any other hungry acquaintance, who did not know of that free lunch opportunity, to get her a delicious lunch for a very competitive charge of, say, $5. The hungry acquaintance would happily agree. The not-so-hungry friend could now go and use that $5 for whatever she really wanted according to her own preferences, e.g. a subway ticket. So, the free lunch, as a proper arbitrage, would be pursued by the not-so-hungry friend as well. It is independent of personal preference. What, however, would happen to a food place that was offering lunches to all and everyone for free? It would either go the way of the dodo, or it would have to charge realistic prices. The arbitrage, hence, would "close". However, if the free kitchen would stay open for a long time, then, quite obviously, someone or something in the background would pay up for its actual costs. Some trickery in the "lunch market" could be assumed.

What should have been done

Fekete should not have given the Fekete-only-arbitrages a new name, as they simply constitute market transactions due to differences in personal preference. Someone, just now, might prefer lunch over cash, but not everyone does. In particular, if there exists a Fekete-only-arbitrage for one person, it does not mean that the same trade constitutes a Fekete-only-arbitrage for another person. In stark contrast to that, we had seen that proper arbitrage is desired by everyone at any time, as some money is always better than no money at all. The presence of Fekete-only-arbitrage is therefore a permanent state – it will not "close" or be "arbitraged away", as otherwise there would be no market transactions at all.

What is the problem?

The problem in Fekete's theory started to dawn on me when I repeatedly stumbled over claims that backwardation in gold futures meant arbitrage. The source of that fallacy, when I tried to trace it back, seemed to be Fekete. Having pointed out to more than one present or former Fekete disciple that backwardation did not at all imply arbitrage, I was told that I did not use the right notion of arbitrage, as they used Fekete's definition. This seemed a fair point, until I came across this piece of text about the gold basis service on the feketeresearch.com web page – which I assume is authorized by Fekete to use his name (reference [2]):

> *The study and monitoring of the basis is always with one perversion in mind: being able to sell spot gold and replace it with a lower cost future – or 'actionable backwardation.' If the gold market moves to this state permanently, then 'risk-free' Dollars can be made perpetually by deferring ownership of physical gold in favour of futures. 'Risk free' and 'permanent' are not states that apply to any market on the whole, let alone with reference to the gold market. '**Risk free**' and 'permanent' tend to **get arbitraged away** before anyone outside the market place notices.* [Emphasis added.]

My first problem lies with the term "risk free". Yes, an arbitrage is risk-free, but it also needs to be better than the risk-free rate. An "arbitrage" that makes 1%, if any bank account would return 2%, obviously is none. If this was overlooked, which could easily happen, then one might arrive at wrong conclusions. My second problem lies with the term "arbitraged away". Essentially, I had been blamed for not considering Fekete-only-arbitrage. But we have just arrived at the conclusion that Fekete-only-arbitrage cannot be "arbitraged away" at all. There was no doubt in my mind that backwardation did not mean arbitrage in the proper, generally accepted sense, and it does not have to go away for that reason. However, now I also had shown that, although it was a Fekete-only-arbitrage, such supposed "arbitrages" still had no reason whatsoever to go away. Hence, Fekete's conclusion that backwardation in gold, since it supposedly made arbitrage possible, was an unnatural state that had to be caused by a breakdown of the gold futures market and the default fears that come along with it, had been falsified.

Why gold backwardation is no arbitrage

This article is not on the backwardation problem in particular, so in the following I will only briefly summarize why backwardation in gold does not imply arbitrage in the generally accepted sense. For further details, I would like to direct readers to my piece "Faux Gold Arbitrage" (reference [3]). The idea of the arbitrage proponents is, as cited earlier (reference [2]): "*being able to sell spot gold and replace it with a lower cost future* [...]*"*. In my own paper on that topic, I wrote:

> *The argument* [...] *goes as follows: Assume that someone owns gold today and that there is backwardation in the gold market present in the sense that the spot price of gold today is higher than the forward price in, say, one year's time. Then, this person can sell gold today and simultaneously enter a forward contract, earn interest over one year, and buy back the gold at the end of that year at a cheaper price. The result is the same amount of gold, plus a cash profit consisting of the earned interest and the price differential between the sale and the purchase price. As this profit was risk-free, so the argument goes, this constituted an arbitrage, something which should not exist as it should be "arbitraged away".*

Here are, in summary, the reasons, why this logic is flawed:

1. Counting wealth in Dollars, the strategy is not risk-free and hence not outperforming the risk-free rate, as the spot price of the gold at maturity could be much lower, and an over-all Dollar loss could be the consequence.
2. Counting wealth in gold ounces, the strategy is risk-free, but no arbitrage, as the return over ounces equals exactly the gold lease rate, which is the risk-free interest rate of gold, which would have had to be outperformed for arbitrage (recall here that arbitrage is independent of the numeraire). I call overlooking this fact the "change of numeraire" trap.
3. Backwardation is omnipresent in currency markets, since, if one currency is in contango against the other, the latter one is in backwardation against the former (mathematical fact). Hence, backwardation is caused by contango. As a logical consequence, contango implies arbitrage too, if backwardation does, but not even Fekete seems to claim this. Of course, there is no arbitrage first place, as the forward curve can be explained by interest rate differentials.
4. Apparently, no one arbitrages these foreign exchange backwardations away in practice either. With gold being a currency with the symbol XAU and its own interest rate (the gold lease rate), the same argument applies to gold.

So, backwardation in gold cannot be arbitraged away – neither in the commonly accepted theory, nor in Fekete's theory, and also not in practice. Any theories or any investment strategies based on this idea could therefore be flawed. Backwardation in gold simply means that gold's interest rate is higher than that of the U.S.-Dollar. This is an interesting and rather seldom occurrence, and the deeper reasons for it, and the possible implications of it, are open to interpretation and, maybe, speculation (see also my article "Why Gold's Contango Suggests Central Bank Interference" on that topic; reference [4]). If the gold forward market came under severe stress because of rising failure-to-deliver risk, it might well be the case that strong backwardation would be the consequence. I have no problem with this idea. However, arbitrage has nothing to do with it, and backwardation in gold could very well exist outside extreme market situations, for instance, it could simply be the consequence of a market expectation of falling gold prices.

Unsolicited advice to Fekete and other "New Austrian" economists

If Fekete and his followers wanted to amend their theories, they need to drop the idea that all market transactions caused by differences in personal preference should be called "arbitrage", as it is highly misleading and will greatly confuse researchers and economists who are used to the generally accepted definition of arbitrage, which has served very well. For their theories to become at least logically consistent, they would also have to refrain from claiming that any market transaction constituted something like an arbitrage in the proper sense, as this simply is not true and could lead to incorrect conclusions. As I wrote in my earlier mentioned paper "Faux Gold Arbitrage" (reference [3]): "*An arbitrageur does not need an economic theory or belief system. All she needs are prices that she can act on."* So, arbitrage theory does not care about economic theory, be it Keynesian, Austrian, or "New Austrian", and this article is not on an economic or monetary issue. Scientifically, Fekete therefore has nothing to gain from not calling things by their proper names. Similarly, using the established names would not take anything away from new economic ideas he might have had. But if Fekete and his fellow "New Austrians" will not use the proper terms, or will continue using them improperly, they have a lot of credibility to lose. Months ago, while analyzing his theory, I contacted and repeatedly included Antal E. Fekete in correspondence regarding the issues raised in this article, as I wanted to discuss them with him in person. Fekete once wrote (reference [5]): *"Science has nothing to fear from an open debate. Feeling of insecurity is characteristic of a cult."* To this day, I have not heard back from him.

References

[1] Fekete, A. E.: *Disequilibrium Analysis of Price Formation. Disorder and coordination in economics* (January 01, 1999). Available at:
www.professorfekete.com/articles/AEFDisequilibrium.pdf (retrieved: December 09, 2013)

[2] www.feketeresearch.com/gold-basis-service2.php (retrieved: December 09, 2013)

[3] Fischer, T.: *Faux Gold Arbitrage.* BullionVault Gold News (September 02, 2013). Available at:
goldnews.bullionvault.com/gold-arbitrage-backwardation-090220135
(retrieved: December 09, 2013)

[4] Fischer, T.: *Why Gold's Contango Suggests Central Bank Interference.* SafeHaven (November 23, 2013). Available at: www.safehaven.com/article/31904/why-golds-contango-suggests-central-bank-interference (retrieved: December 09, 2013)

[5] Fekete, A. E.: *Note* (from September 09, 2005). In: Fekete, A. E.: W*here Mises Went Wrong* (September 16, 2005). Available at:
www.professorfekete.com/articles/AEFWhenMisesWentWrong.pdf (retrieved: December 09, 2013)

Dr. Tom Fischer is professor of financial mathematics at the University of Wuerzburg, Germany. His research interests lie in the areas of asset and derivative pricing, systemic risk, risk capital allocation and FX risk management. As a gold and silver investor, professor Fischer closely follows the precious metals markets and has developed a proprietary stochastic gold price model for Approximity. He is a member of the German Association for Actuarial and Financial Mathematics (DGVFM) and the German Risk Management Association (RMA e.V.). Prof. Dr. Fischer can be contacted under tom.fischer@uni-wuerzburg.de.