A Simple Measure of Purchasing Power Parity (PPP)

FQ Perspective

by Max Darnell and Dori Levanoni

Despite the success of active specialist currency managers generally, the effort to add value through active currency management is fairly commonly presumed to be more challenging than it is with stocks and bonds. Much of this misconception is based upon the myth that long-term currency valuation (Purchasing Power Parity, or "PPP") doesn't work, so we like to remind people every few years just how well long-term currency valuation does work. For fun, and to help drive the point home, we've road-tested the Economist's Big Mac Index (our "Burgernomics Update") to see how well it does as an indicator of future relative currency performance. It does pretty well for something as spectacularly simple as it is.

Purchasing Power Parity is the idea that a good (or service) should be priced identically in all markets, once exchange rates are taken into account (i.e. once all prices for that good or service are put into a common currency). If any price is "out of line", there is a theoretical goods arbitrage trade available, where we would purchase the good in the "cheap" market, sell it in the "expensive" market, and convert the proceeds back into our base currency. As markets abhor such an arbitrage, exchange rates should adjust to prevent it from being profitable.

And so, it is one way in which to tell an "expensive" currency from a "cheap" one.

Each spring, the Economist magazine publishes an update of a particular good's prices in various markets in the world, and in so judges which currencies are "overvalued" and which are "undervalued". The good used by the Economist is McDonald's Big Mac, which is currently available in nearly 120 countries around the world[1].

In our study[2], we used the Economist's Big Mac index as the sole input into an investment process that invested nine currencies[3], starting in 1989. The process builds one portfolio a year (after the Big Mac Index is published), holds it for one year, and then trades it to the new portfolio (once the Economist publishes the next Big Mac index). We overweight the currencies that are "undervalued" and underweight those currencies that are "overvalued". We do allow the portfolio to be unbalanced, since that represents an implicit view on the valuation of the US Dollar (it is currently modestly overvalued).

In the beginning...
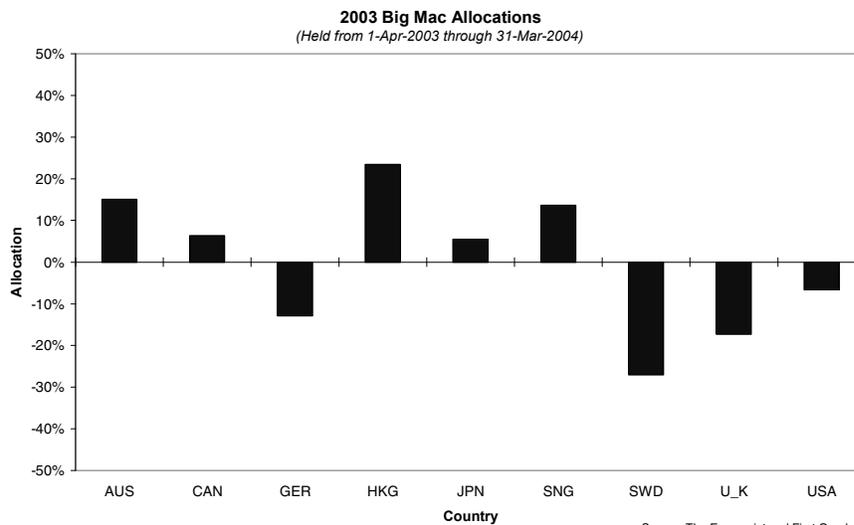
As a reminder, the portfolio we considered at the end of March last year is shown in the chart on this page.

2003 Big Mac Allocations
(Held from 1-Apr-2003 through 31-Mar-2004)

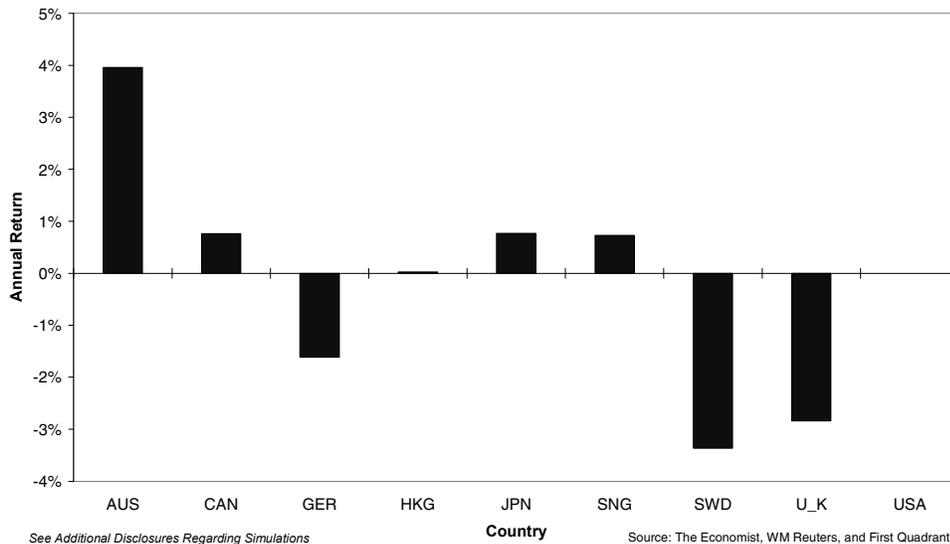Source: The Economist and First Quadrant

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So, how did that portfolio do over the last year?

Unfortunately, not that well. The portfolio lost 1.58% over the year from April 1, 2003 through March 31, 2004. We can look inside the portfolio and attribute that performance on a currency-by-currency basis, as shown in the chart on this page.

While the overweight Australian Dollar position did fairly well (as did overweight allocations to the Canadian Dollar, Japanese Yen and Singapore Dollar), the underweight allocation to the Euro, Swedish Krona and British Pound more than offset those gains, resulting in a modest down year for the Big Mac portfolio.

BigMac PPP model 2003 performance

See Additional Disclosures Regarding Simulations   Source: The Economist, WM Reuters, and First Quadrant
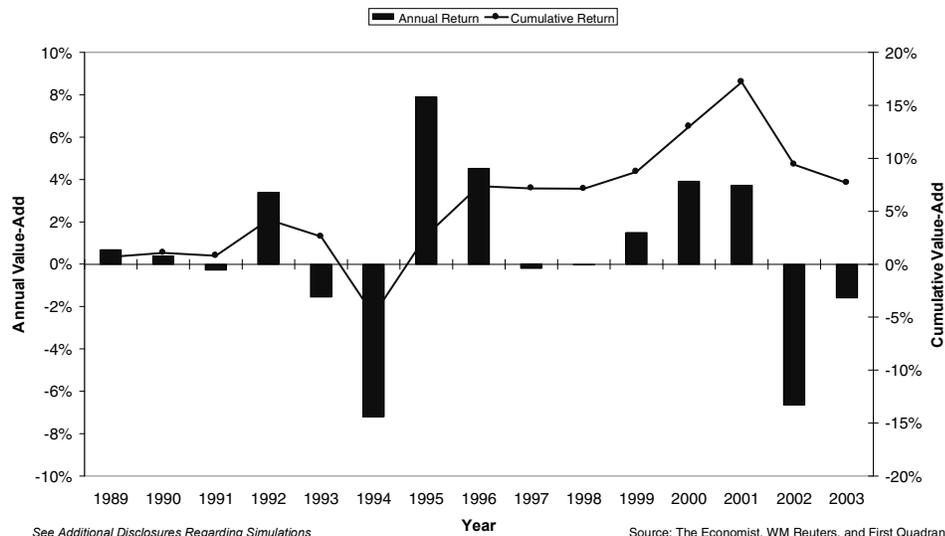
Since inception, however, the Big Mac Index is still in positive territory, with an annualized information ratio of 0.14. The realized tracking error is almost exactly 4%, and so the annual alpha is right around 0.50% (or about 7.7% cumulative since 1989).[4]

While First Quadrant does believe in PPP as useful predictor of currencies, we don't use the Big Mac model in our process, for a few reasons, some too obvious to mention. It's available only once a year, and we'd prefer to have a more timely measure. Furthermore, because Big Macs aren't, strictly speaking, tradable, the cost of a Big Mac in each country includes aspects that are non-tradable, such as taxes and real-estate costs, which can skew the measure somewhat. In addition, trade frictions do prevent an actual goods arbitrage in Big Macs.[5]

Perhaps most importantly, we don't use the Big Mac Index, nor do we use any of the competing publicly available, and more ''serious'' constructions of PPP (e.g., the World Bank's measure of PPP), for the simple reason that ours works better. The performance of our PPP over the same period as that studied above for the Big Mac Index is twice as powerful, with a realized Information Ratio of 0.21[6], a nearly 50% improvement. Admittedly, there are more elements working to our advantage as well. Our construction of PPP, includes additional corrections relating to medium-term influences on fair-value, so in some sense, it's not an entirely fair comparison. Our objective isn't to compare, but rather to show that even something as simple as the Big Mac Index *does work!*

BigMac PPP Model Value-Added
(1989-2003)

See Additional Disclosures Regarding Simulations   Source: The Economist, WM Reuters, and First Quadrant

Where's the Beef?

Also for fun, we thought we'd show you just how similar a measure as simple as the Big Mac Index could be to our own, more complicated version. If we look at today's positions, the Big Mac portfolio is only modestly different from our own. First Quadrant's proprietary measures

than is the case when using less sophisticated models like our own. We find that currencies converge towards our measure of fair value on average in about two years. That's pretty good for a valuation measure.

The point that we want to make, then, is that valuations don't converge any slower for currencies than

2004 Big Mac Allocations
(To be held from 1-Apr-2004 through 31-Mar-2005)

■ Big Mac PPP ■ FQ PPP
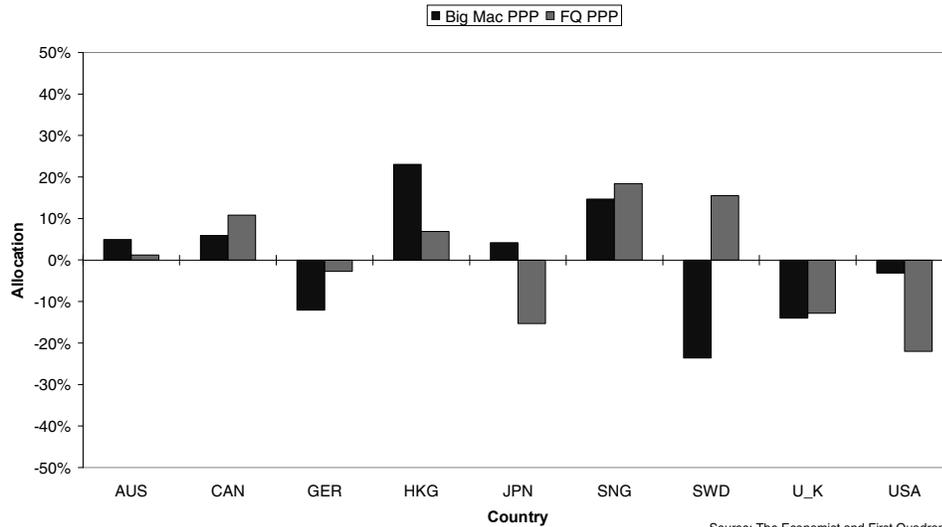
Source: The Economist and First Quadrant

agree fairly closely with the Big Mac in some markets (particularly in Canada, Singapore and the United Kingdom), but differ most notably about Sweden, where we do find the Swedish Krona somewhat undervalued.

In Closing

It's worth closing with a final point about why the myth that PPP doesn't work survives. Before making those points, we should first point out that even the academics don't really claim that PPP "doesn't work." What the majority of papers really suggest is that it does work, but it can take a fairly long period of time to work. That's true. The bells and whistles that we've attached to our own measure make it work more effectively, which simply means that it tends to take less

they do for other assets. What differentiates the tone of the academic conclusions from the practitioners' conclusions is that the question being asked is different. Academics have asked whether *individual* currencies may stray from their equilibrium (fair) value for long periods of time. Yes they can. So can individual equities or bonds. Practitioners are asking whether a *portfolio* of currency exposures based on PPP would produce profits on a relatively short time scale (such as on a monthly or quarterly basis). It's ok if there's a currency or two that resists movement towards its fair value as long as there is more movement towards fair values amongst the array of currencies in the portfolio than there is away. In other words, we can live with exceptions as long as the average is right. We find it to be so.

Endnotes:

[1] Source: www.mcdonalds.com McDonald's Corporation website, 9-June-2004.

[2] "Purchasing Power Parity: Even the Big Mac Can Predict FX Rates", October 1999 First Quadrant Partner's Message.

[3] AUD, CAD, DEM, HKD, JPY, SGD, SEK, GBP and USD. Those currencies were chosen as the only currencies with Big Mac data going back continuously to 1989.

[4] All returns are gross-of-fee, since we'd have to charge fees as Big Macs, and our diets wouldn't allow it.

[5] Picture, if you will, enormous container ships cross the ocean, delivering Big Macs from China (the cheapest Big Mac in the world) to Switzerland (the most expensive Big Mac in the world). Doesn't seem terribly efficient, does it?

[6] Still gross-of-fee.

Additional Disclosures - Simulated Performance *Past performance is no guarantee of future results. Potential for profit is accompanied by possibility of loss.* **SIMULATED PERFORMANCE:** The strategy used in the simulations presented in this article does not reflect any strategy or product offered or managed by First Quadrant. The simulated performance presented differs from live performance for the following reasons: The simulations assume that the guidelines are constant through the life of the portfolio, whereas the guidelines for live portfolios may have changed over the life of each portfolio. Simulated returns do not represent actual trading and may not reflect the impact that material economic and market factors might have on the adviser's decision-making if the adviser were actually managing a client's assets.