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For Here or To Go?

The Big Mac Takes a Bite out of International Trade Theory

Two all-beef patties, special sauce, lettuce, cheese, pickles, onions, on a sesame seed bun ...

Federal Reserve Bank of St. Louis Research Economists Michael R. Pakko and Patricia S. Pollard have made hamburger out of international trade theory in their examination of Purchasing Power Parity (PPP) using McDonald's Big Mac as their main entree. The theory states that prices of identical goods in different countries should be equal after adjusting for the rate of exchange between currencies. PPP has as its foundation the law of one price which states that the price of any particular good that is traded on world markets will be the same in every country engaged in trade. For instance, consider the price of sesame seeds —one of the basic ingredients of the Big Mac—in Britain and the United States. If sesame seeds are cheaper in the United States than they are in Britain, astute commodity traders will simply buy U.S. sesame seeds rather than British and sell the U.S. sesame seeds to McDonald's in Great Britain. However, sooner or later the increased demand for U.S. sesame seeds would drive up their price, and the decreased demand for British sesame seeds would lower the British price. Obviously over time the law of one price would prevail in international markets.

Sold in more than 80 countries worldwide, the Big Mac is a standardized bundle of goods. Most of the ingredients that go into a Big Mac are individually traded on international markets so we might expect that the law of one price would hold, at least approximately.

Does PPP pass the Big Mac test?

If the PPP passes the Big Mac test, the prices of these hearty sandwiches should be relatively equal after accounting for exchange rate differences. Let's examine the menu. In 1994 it cost $2.30 to buy a Big Mac in the United States, $3.77 to buy a Big Mac in Japan, and $1.66 to buy a Big Mac in Hungary. Thus a Big Mac devotee could buy nearly 1 2/3 of the sandwiches in the United States for everyone one he could purchase in Japan. But he'd be in a pickle in the United States since he could only buy less than 3/4 of a Big Mac for every one he could enjoy in Hungary.

However, one wouldn't expect Japanese and U.S. consumers to import Big Macs from Hungary to take advantage of the lower prices—a Big Mac sandwich shipped halfway across the globe would probably not be very tasty.

If the Big Mac is no more than the sum of its ingredients, then trade should equalize the price of a Big Mac across borders; or at the least, differences between prices should narrow over time. Instead, the dollar price of a Big Mac in the three countries diverged by even more in 1995 than in 1994. In 1995 it cost $1.58 to buy a Big Mac in Hungary, $2.32 to buy a Big Mac in the United States, and a beefy $4.65 to buy a Big Mac in Japan.

How do Pakko and Pollard explain these deviations from the PPP? Their explanations include the existence of barriers to trade, the inclusion of non-traded elements in the cost of a Big Mac and imperfect competition.

Barriers to Trade

One simple reason why PPP fails to hold is that it is costly to ship goods across countries. The cost of shipping the sesame seeds needed for the Big Mac buns may be minimal, but shipping perishable ingredients such as lettuce and beef is more costly. Transportation costs, therefore, may drive a wedge between the prices of the same good in different markets.

A more important factor than the presence of natural barriers to trade is the existence of tariffs and other legal restrictions on trade. Nearly every country restricts the importation of agricultural goods through the use of tariffs and quotas in order to protect its domestic farm sector. Tariffs, which represent a tax on imported goods, and quotas, which limit the amount of a good that can be imported, both raise the price of agricultural imports.

Non-traded Goods

The price of a Big Mac in any country reflects more than the price of its ingredients. To sell its products, McDonald's has to buy or lease space for a restaurant and purchase utilities to heat, cook and light the restaurant, as well as to run everything from the grills to the cash registers. Real estate and utilities are not traded internationally. To the extent that rent and utilities determine the cost of a Big Mac, deviations from PPP may simply reflect these cost differences across countries.

The price of a Big Mac also reflects a service component—that is, the cost of preparing the Big Mac and serving the customer. These aspects require the use of workers, who in economic terminology are also non-traded goods. McDonald's workers, like all workers, are restricted in their ability to move across borders to take advantage of wage differentials.

Imperfect Competition

Under the condition of imperfect competition, traded goods prices may not be equal across countries. Though it may have close rivals in some markets, the Big Mac itself is produced by only one company; therefore, we might expect to find market conditions of imperfect competition. In some markets, most notably the United States, the Big Mac has close substitutes; in others, the Big Mac has few substitutes. Perhaps this is because a Big Mac is more than the sum of its ingredients. In Russia, for example, the price of a meal at McDonald's is expensive relative to other restaurants. However, the quality of the food is considered far superior to that offered in most other restaurants frequented by the average Russian. In addition, the food itself is only part of the attraction. People choose to frequent McDonald's for more than the burgers, such as the courteous, efficient service or cleanliness of the restaurant.

The Last Bite

Since many of its basic ingredients are tradable goods, we might conclude that prices of Big Macs would be subject to the theory of Purchasing Power Parity (PPP) and the law of one price. However, its other characteristics make the Big Mac a good example of why the theory of PPP generally fails to hold except under special circumstances.

A New Jingle?

To aficionados of classic television commercials, the ingredients of a Big Mac sandwich are indelibly etched into memory in the form of a jingle. In terms of the United Nations' Standard International Trade Classifications (SITC), the jingle might sound a little different:

Ingredient	SITC Code	SITC Description
All-beef patties	01122	Meat of bovine animals, boneless, frozen
Special sauce	09849	Sauces and preparations, not elsewhere specified (NES), mixed condiments, and seasonings
Lettuce	05454	Lettuce and chicory, fresh or chilled
Cheese	02420	Processed cheese, not grated or powdered
Pickles	05456	Cucumbers and gherkins, fresh or chilled
Onion	05451	Onions and shallots, fresh or chilled
Sesame-seed bun	04849	Baker's wares, NES
	22250	Sesame (sesamum) seeds