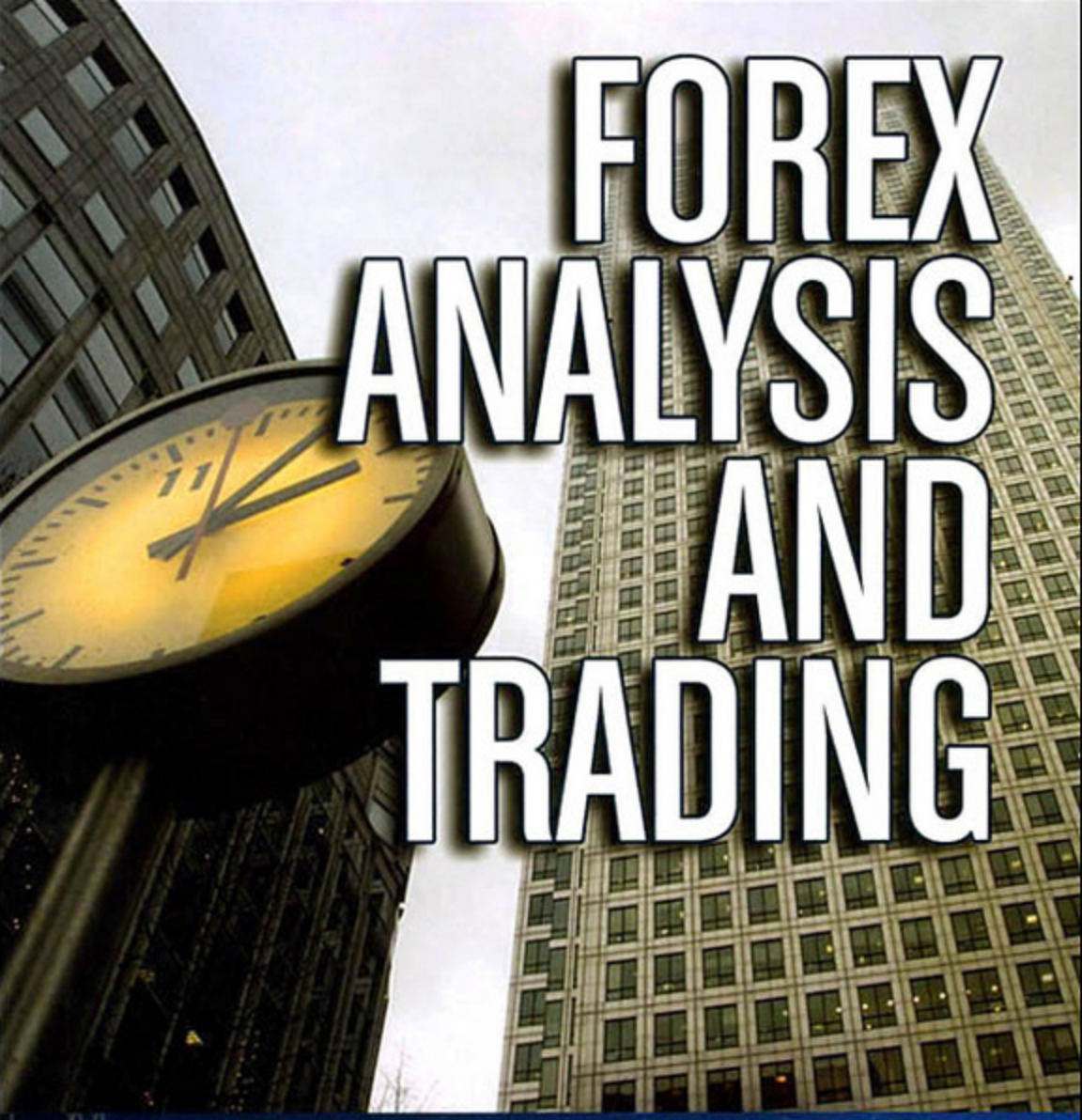

FOREX ANALYSIS AND TRADING

EFFECTIVE TOP-DOWN STRATEGIES COMBINING FUNDAMENTAL, POSITION, AND TECHNICAL ANALYSES

T. J. Marta
Joseph Brusuelas

Forex Analysis and Trading

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and
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Bloomberg Press
New York

First edition published 2009
1 3 5 7 9 10 8 6 4 2

Library of Congress Cataloging-in-Publication Data
Marta, T. J.
Forex analysis and trading : effective top-down strategies combining fundamental, position, and technical analyses/T. J. Marta and Joseph Brusuelas. -- 1st ed.
p. cm.
Includes bibliographical references and index.
Summary: "Two foreign exchange trading professionals share their unique top-down approach to currency analysis. Their approach combines the best of fundamental, sentiment, and technical analysis to reveal the most profitable trading opportunities in one of the world's largest markets"--Provided by publisher.
ISBN 978-1-57660-339-0 (alk. paper)
1. Foreign exchange market. 2. Foreign exchange futures. 3. Currency convertibility. 4. Investment analysis. I. Brusuelas, Joseph. II. Title.
HG3851.M315 2009
332.4'5--dc22
2009039852

This book is dedicated first to my wife, Melissa, and my children, Alexis and Joseph, who have supported me during this effort; second, to Don Alexander and Robert Sinche, who provided solid and steady mentorship; and third, to all who embark on the quest for the Holy Grail of currency valuation.

—T. J. M.

This book is dedicated to my wife, Amanda Jefferis: a woman of extraordinary intelligence, sweetness, and grace without whom life would be far less meaningful.

—J. B.

Acknowledgments

I'd like to acknowledge the support of my wife, Melissa, and children, Alexis and Joseph, who put up with numerous lost weekends and cancelled and delayed plans. From a professional perspective, this book would not have been possible without Don Alexander, who gave me my first shot on Wall Street and provided me with the framework by which to analyze long-term currency trends. Bob Sinche, my manager at Citigroup's institutional foreign-exchange research group, provided a tireless example of leadership and multifaceted analysis of foreign-exchange valuation and trading opportunities. I'd also like to thank the numerous professionals I've had the pleasure of meeting and discussing Forex with over the years. Finally, special thanks to Stephen Isaacs of Bloomberg for his editorial skills in guiding me through the process of putting years of thoughts and experience into some semblance of organized layout.

—T. J. M.

I would like to acknowledge the support of my father, Herman, and my mother, Donna, and thank my brothers Jason and James and my sister Rebecca, and her husband, A. J., for their love and encouragement. On a professional level, Robert Since, Ryan Sweet, Aaron Smith, Chris Cornell, Nathan Topper, and Michael

Bratus have all provided valuable insight during the writing of this text. Finally, I would like to thank our editor, Stephen Isaacs, whose editorial skills made a complex and time-consuming effort so much easier than it should have been.

—J. B.

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INTRODUCTION

How far will the dollar adjust? Within the context of a $3-trillion-a-day foreign-exchange market, the very question of the basic value of the greenback is perhaps the single biggest day-to-day issue in the global economy. Given the recent turbulence experienced by the global economy, the size of the U.S. current account deficit, the rate of consumption in China, and the structural impediments to growth in the European Union, the fundamental question of the adjustment of the dollar has become more—not less—important in the basic functioning of the global economy.

An economist can primarily focus on how larger macroeconomic changes will affect the value of the euro/dollar in the long run. Yet the larger macroeconomic questions that may affect the valuation of a currency pair over the long run may not be so useful in determining the fair value of a pair over the course of weeks or days, and almost never in the course of a single trading session. Portfolio managers and investors with position horizons of days and weeks cannot wait for long-term theory to "kick in," and traders must instantaneously digest news, economic data releases, and trade flows. A currency strategist interacts with all three types of market participants both as a consumer of those groups' information and as a provider of information to those

groups. The range of both inputs and demands requires the application of a variety of methods by which to determine the value of the dollar.

Unlike many texts on foreign-exchange analytics, this text will not present one overarching methodology as "the way" to determine fair currency values. Rather, our approach, which relies on a multidisciplinary examination, provides an analytical framework for institutional analysts to utilize in making successful investment decisions regarding the currencies of major countries. Rather than presenting the disparate disciplines that are employed to make currency decisions in separate vacuums, this book recognizes that different perspectives take on key relevance in markets under varying conditions, and therefore, that the best investment decisions are based on inputs from the full spectrum of considerations.

Our analytical paradigm consists of three main groupings: fundamental, positioning, and technical. By employing this analytical framework, we believe that this text provides an accurate and realistic look into how foreign-exchange analysts, economists, investors, and traders actually seek to put together profitable investment and trading strategies and mitigate risk in the open global economy.

The foundation and starting point of our framework consists of fundamental analyses to provide macroeconomic and cross-asset perspectives. The second grouping consists of positioning

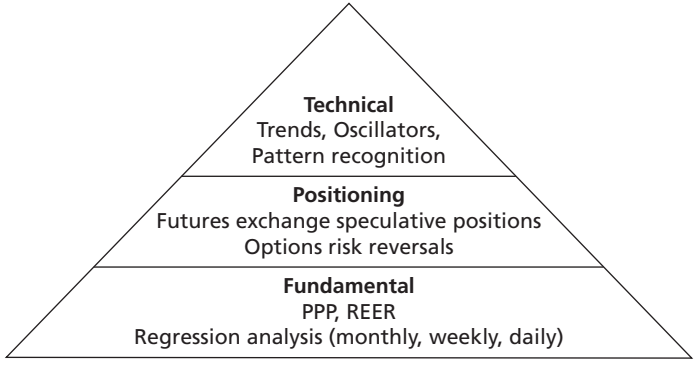

Figure I.1 Comprehensive Currency Analysis Framework

analysis, which attempts to identify extremes in positioning—and so potential turns in market sentiment/direction. Finally, technical analysis provides even more precise price action "triggers" for investment and trading decisions.

Fundamental Analysis

We begin the analysis of any currency using fundamental variables. The very broadest considerations involve purchasing power parity (PPP) and real effective exchange rate (REER) analysis. These frameworks permit an analyst to establish a contextual perspective regarding the "value" of a particular currency. These analytical tools are well suited to long-run exchange-rate determination and are useful to buy-side firms that practice buy-and-hold strategies or global firms that are engaged in long-term planning in a dynamic foreign-exchange environment.

However, the limits of the long-run approach favored by academics and some buy-side institutions are quite observable. Long-run valuations are so broad in scope, they often provide only modest value to traders or risk managers who require more detailed analysis to determine value and potential price action over a more actionable time horizon.

A more precise valuation of a currency's fundamental fair value for the medium term can be obtained using regression analysis based on monthly economic and financial data. Regressing the currency against financial data using fifty-two weeks of weekly data further refines this estimate. Finally, recognizing that different fundamental considerations can dominate price action over shorter time horizons, one can employ regression analysis of daily price action using sixty-day time horizons to obtain short-term valuations.

Positioning Analysis

Whereas the above methods provide a robust analysis using macroeconomic and cross-asset underpinnings to explain valuations and price action, they do not always lead to profitable decisions. Too

often, a purely fundamental approach ignores the psychological aspect of market behavior. According to an old, wise adage, "the markets can stay irrational longer than an investor can stay solvent." Thus, we incorporate a second level of analysis based on measures of market positioning that allows market actors and risk managers to identify extremes and potential changes in the direction of the market.

Two publicly available measures of market sentiment are the positions reported to the U.S. Commodity Futures Trading Commission (CFTC) by non-commercial traders (sometimes referred to as speculators) and options risk reversals. The CFTC positions are collected by the CFTC once per week on Tuesdays and released on Fridays. Extremes in the positions of non-commercial traders relative to the CFTC positions in recent months allow an analyst to identify when at least one segment of the trading/investing community has not only likely exhausted its ability to contribute further to a price trend, but also could be more likely to begin trading the other way in a market, precipitating a reversal in price action. The drawback of the data is that it is published late on Friday afternoons in the United States when liquidity is low, and that it is three days old when released.

A timelier positioning indicator, although one measuring a different segment of the market, is the risk-reversal skew in the options market (risk reversals). Risk reversals measure the difference in premium for puts versus calls on a particular currency. Extreme readings suggest that options traders are "off balance" in their view regarding future price action, which suggests an increased potential for a reversal in price action. Whereas shifts in both the CFTC and risk reversals tend to correspond to shifts in price action relative to trend, they are frustratingly ambiguous in providing concrete entry or exit levels, and this leads us to the third section of our currency analysis: technical analysis.

Technical Analysis

Detractors liken technical analysis to reading tea leaves. Technical analysts retort that price action "says it all" regarding what is

going on in the market and scoff at how often "fundamentalists" obstinately hold a position when price action is screaming that one's view of how the world works "just isn't so." We remain firmly neutral in this bitter debate, noting only from a pragmatic perspective that if enough market participants decide that price action in regards to a channel support, a head-and-shoulder neckline, or a 76.4 percent Fibonacci retracement is important, then it probably *is* important.

Consequently, we are not looking to establish "black box" technical trading models, but to offer a framework that incorporates changing market sentiment and an appreciation of which specific levels or patterns could be decisive in influencing behavior and price action. In viewing the foreign-exchange markets through a multidimensional prism, a decision maker can make more informed—and profitable—decisions.

PART

I

Fundamental Analysis

As we write this in the spring of 2009, the near collapse of the global financial system in 2008 has ushered in the most severe economic downturn since the Great Depression. Dislocation in financial markets caused by the breakdown of monetary discipline, lack of financial regulation, and imprudent lending standards by financials has unleashed a sea of volatility in the global market for foreign exchange.

This market, with a volume of close to three trillion dollars per day, has perhaps experienced its greatest volatility of any time during the era of floating exchange rates. Between January 2007 and February 2009, the exchange rate of the euro/dollar (EUR/USD) has moved from a position of overvaluation to undervaluation and back. The yen has seen highs not experienced since 1995, and the stabilization of emerging market currencies such as Mexico's has been lost amid 10 percent declines in valuation in a single day against the dollar.

From December 2008 to February 2009, market sentiment swung from expecting the long-term secular decline of the dollar to the greenback threatening to drive towards parity with the euro. A few short months later, the new quantitative easing policy of the U.S. Federal Reserve, which provides an outsized risk to the long-term inflation prospects of the United States, has swung the market back in the other direction. The euro once again, as of June 2009, appears to be ascendant and the dollar in decline. Unless, of course, the European Central Bank adopts its own version of quantitative easing that will engender another period of volatility in currency markets. Of course, the Chinese call for the adoption of a new global reserve currency, due to the problems in the advanced economies, carries with it the possibility to reorder the global economic landscape.

Under such conditions, the attempt by economists and currency strategists to construct short-term trading strategies or corporate actors to manage foreign-exchange risk is fraught with extreme difficulty. But the advent of a global economy that demands the exchange of currency on a continuous basis does not provide such a luxury.

Yet what on one hand may seem to be a curse, on the other offers tremendous opportunity. For the seasoned foreign-exchange trader this is a difficult but potentially lucrative environment in which to put into practice the ideas, tactics, and strategies at the heart of this text.

So, under such conditions, how does one derive the fair value of the dollar versus the other major currencies? Where should one start, given the significant disturbances in the foreign-exchange markets observed over the past forty years and the probability of further volatility ahead? What value does fundamental analysis have for the currency analyst in such an environment? The first section of this text intends to provide an answer to those potent questions by presenting the theoretical backbone of fundamental analysis, which still plays a significant role in assessing fair exchange-rate values.

1 Purchasing Power Parity

Purchasing power parity (PPP): three words that are sure to warm the heart of any currency economist. But that same concept is certain to cast a glaze over the eyes of most observers of foreign-exchange markets and send a surge of skepticism up the spines of experienced foreign-exchange traders. Yet, the value of such a tried-and-true method of deriving foreign-exchange rates has not diminished.

The Organization for Economic Cooperation and Development (OECD) defines PPP as the rate of currency conversion that equalizes the purchasing power of different currencies by eliminating the differences in price levels between countries. Put a bit more simply, PPP is a method through which one can evaluate how changes in the absolute or relative price level drive changes in the underlying exchange rate between two currencies. This chapter discusses the relative usefulness and shortcomings of employing PPP in foreign-exchange analysis.

Law of One Price

To obtain a solid grasp of the concept of PPP, it is necessary to first understand the law of one price. The law of price reflects the idea that if two firms in different countries produce identical goods,

assuming that transportation costs are stable and trade barriers low, then the cost of that good should be the same throughout the global system. Thus, if American-made desktop computers cost $90.00 per unit in the United States, and an identical Japanese computer costs 8,100 yen in Japan, the exchange rate must be 90 yen per dollar ($0.011 per yen). If this condition holds, then one U.S. computer must sell for 8,100 yen in Japan, and one Japanese desktop must sell for $90 in America.

If the exchange rate were to increase to 180 yen to the dollar, then the cost of a Japanese desktop computer would be $45.00 per unit, and the price of the same American product in Japan would be 16,200 yen. Thus, the cost of a Japanese computer would be reduced by roughly half, due to the change in the relative exchange rate, increasing the purchasing power of all those holding dollars. (See **Figure 1.1**.)

In theory, due to Japanese computers being relatively cheap, demand for these computers in both America and Japan should increase and demand for U.S. computers should fall to close to zero. Since U.S. computers are more expensive than the identical machine in Japan, the net impact is that the resulting increase in supply of U.S. computers will be reduced as the exchange rate falls back to $90.00, which would bring the price of identical computers in Japan and the U.S. back into alignment.

Purchasing Power Parity

Economists often use PPP to ascertain the fundamental value in foreign-exchange markets between two currencies. It asserts that the exchange rate between any two currencies will adjust in light of changes in the price levels of the two home countries of the units of exchange. At its core, PPP is an attempt to explain the relationship between the prices of tradable goods and the exchange rate. Thus, the theory of PPP states that the long-run equilibrium value (E) of a currency is primarily determined by the ratio of domestic prices (P) in the home country relative to those abroad (P^*).

$$E = P/P^* \tag{1.1}$$

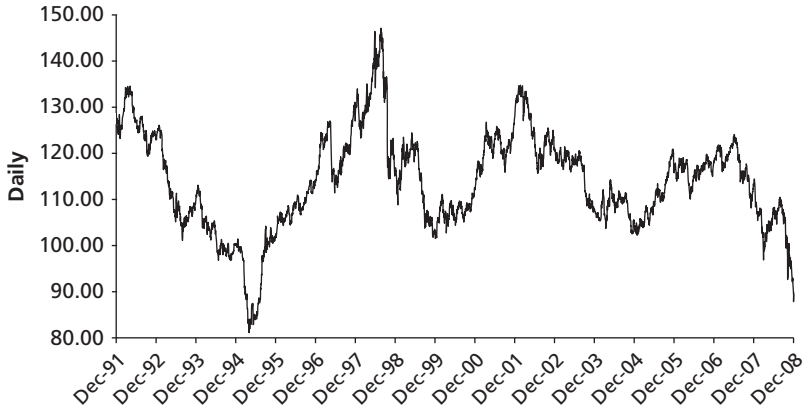

Figure 1.1 Dollar/Yen Exchange Rates

Source: Federal Reserve Board.

Using this framework, the theory of PPP would suggest that the long-term equilibrium value of the dollar/yen rate (\$/¥) would be determined by the ratio of the price level in the United States (P_{US}) relative to the price level in Japan (P_J).

$$\$/¥ = P_J/P_{US}$$

According to PPP theory, one can fairly derive the fundamental value of a currency by estimating what an identical product can be purchased for at home and abroad. In our example, the relative cost of an identical computer in the United States should be exactly the same as it is in Japan.

However, theory does not always approximate reality. Should exchange rates overshoot or undershoot equilibrium PPP levels, opportunities for individuals to engage in arbitrage would ensue. For example, if computers in the United States due to a change in the exchange rate were to become cheaper than those in Japan, opportunistic individuals and firms could then buy low in the United States, sell high in Japan, and capitalize on the relative change in the exchange rate. Thus, capital and goods would flow between the two countries until such a time (no doubt a very

short period of time) when the cost of purchasing identical computers in both the United States and Japan falls back into equilibrium.

Variation on a Theme

Inside the investment community most economists and foreign-exchange analysts use some variation of purchasing power parity to derive what they consider to be a reliable and robust estimate of the fair value of exchange rates. Should exchange rates of a currency pair deviate too far from PPP, many if not most analysts would expect over the long term that the pair would move back towards equilibrium.

Yet, as Keynes stated, "in the long run, we shall all be dead." Thus, it is of little surprise to observe that there is more than one version of PPP and several factors that affect exchange rates in the long run.

Absolute Purchasing Power

The theoretical underpinning of PPP rests on a set of assumptions. Thus, by conveniently assuming away differences in transportation costs, transactions costs, restrictions in trade, and taxes, it is possible that tradable goods that are identical should be available at the same price anywhere in the global economy after accounting for exchange rates. This is often referred to as the absolute version of PPP simply because it deals with an absolute price level. This is easily understood by the following: Let S indicate the U.S. dollar/yen exchange rate, \$/¥. Then let P signify the price level in the United States and P^* denote the price level in Japan. Thus, we can express the absolute version of PPP as

$$P = S \times P^* \tag{1.2}$$

Put a bit more simply, the price level of the domestic currency should be absolutely equal to the foreign price level multiplied by the spot exchange rate. This version of PPP can be applied to all identical tradable goods and services. Thus, P is a representation

of a wide range of goods, but not a single good. This strongly suggests that the activity of arbitrage plays a critical role as a catalyst for the convergence of prices implied by the law of one price that lies at the heart of the idea of absolute purchasing power parity.

Shortcomings in Absolute Purchasing Power Parity

However conceptually attractive the absolute variant of PPP is, there are several shortcomings to this potent explanation of long-term exchange rates. Paramount among these shortcomings is the fact that as a short-term predictor of exchange-rate movements, PPP does not have the best record. How could a basic theoretic explanation that is used in just about every introductory and intermediate economic textbook be so deficient? The answer is located in the basic assumptions behind absolute PPP.

First, the basic assumptions of no differences in transportation costs in an era of volatile energy costs and the variation in energy subsidies from country to country cast considerable doubt upon this idea.

Second, the variations in tariffs and taxes from country to country are quite dramatic, and these factors play a significant role in shaping the incentives to produce and the relative costs of goods.

Simplification of reality through the use of such assumptions is quite useful for the development of theory and the models to support it. Yet, for the spot trader or forward-desk analyst, theoretical elegance or long-term efficacy is of little use in formulating day-to-day or near-term strategies.

Relative Purchasing Power

Due to the limitations of the absolute version of PPP, some analysts rely on a bounded version that focuses on price changes as opposed to a singular emphasis on absolute price levels. This is best understood by the following. Let $\%\Delta$ denote the percentage change of a variable, S the spot rate, P the price level, and P^* the

foreign price level. Thus, the concept of relative purchasing power can best be expressed by the following:

$$\%\Delta S = \%\Delta P - \%\Delta P^* \tag{1.3}$$

This implies that a change in the exchange rate equals the difference in percentage change in prices between the two economies. Foreign exchange-rate analysts would then focus on the public rate of inflation. Keeping within the framework of our earlier example, then let Π be the rate of inflation in the United States and Π^* be the rate of inflation in Japan. Then if a foreign-exchange analyst were interested in seeking to estimate the possible appreciation or depreciation of the dollar/yen spot rate, he would investigate the differences between the two countries' inflation rates. Thus, we can rewrite the expression for relative PPP as

$$\%\Delta S = \Pi - \Pi^* \tag{1.4}$$

For example, assume that the nominal exchange rate for the USD/UK pound (\$/£) in a given base year was \$1.50. Then assume that the price of goods and services in the United States had risen by 8 percent, and the cost of those same goods and services in the United Kingdom had risen by 4 percent. Then the PPP spot rate would be $\$1.50/£1 \times 1.08/1.04 = \$1.557/£1$. The nominal exchange rate of \$1.557/£1 can be used to establish a PPP comparison to the base period. Thus, a nominal exchange rate greater than \$1.557/£1 implies that the British pound is overvalued, and a nominal exchange rate less than \$1.557/£1 suggests that the U.S. dollar is overvalued.

PPP and Exchange-Rate Analysis

Without a doubt, PPP is a useful method in the toolbox of any economist. Over the long run, PPP can provide a fairly effective tool for predicting exchange rates. Yet, like many theoretical propositions in the dismal science, the reliability of either version of PPP is a function of the conditions under which it is used. For example, if one were to observe a monetary-induced shock to an equilibrium position, PPP will tend to hold up very well. Why?