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## Exchange rate theory and “the Fundamentals”

One of the central concepts in post-Bretton Woods orthodox exchange-rate theory has been the Fundamentals. A large percentage of the sizeable literature in this area is devoted either to discovering the identity of these variables, or to determining their role in currency price determination. No final verdict is close to being rendered as scholars continue to be baffled by the foreign exchange market's behavior (Dixon, 1999; Flood and Rose, 1999; MacDonald, 1999; MacDonald and Taylor, 1992; Rogoff, 1999; and Taylor 1995a). It is an exciting, if frustrating, area in which to conduct research.

A perplexing feature of this line of inquiry is the almost complete lack of attention to careful explanation of the specific concept—the Fundamentals. Most commonly, they are defined by example, by association, or by what they are not. Never, even in those instances where the Fundamentals are the primary focus of the analysis, is a well-structured, functional definition offered.

Part of the problem, of course, is the uncertainty surrounding the nature of currency price determination. But that cannot be the only factor, for one can certainly write an operational definition of a phenomenon without knowing all its specifics. In fact, doing so would seem to be an important early stage of resolving the question. Nevertheless, little progress has been made on this front.

Strangely, no one participating in this scholarly exchange seems to be terribly worried about this development. This suggests that either the economists involved have entirely missed the inconsistencies in the literature, or that there exists a set of underlying, shared beliefs about currency markets that makes the various definitions, if not identical or even well-advised, at least compatible. The argument discussed in this paper is that the latter is true, and that, in particular, neoclassical economists'

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conception of markets as *benevolent* systems serves to unite the otherwise disparate approaches to the Fundamentals. If one rereads the pertinent literature with this in mind, then it becomes clear that, although there is still some variation in economists' use of the term, what is generally meant by Fundamentals is *that set of variables guaranteeing the efficient operation of the foreign currency market*. Furthermore, it is because the Fundamentals, so defined, are incapable of fully explaining foreign currency movements that no process of refinement has taken place. This creates serious obstacles for currency market research. So long as economists cling to the Fundamentals (as currently defined) as *the* explanation of exchange rate movements, the literature will be marked by vagueness, circumlocution, and stagnation.<sup>1</sup>

The paper is organized as follows. First, the nature and source of the benevolent-markets bias in the Fundamentals is explained. Second, exchange rate literature is reviewed, and the various definitions of the Fundamentals are categorized. In the process, their relation to the bias outlined in the previous section is highlighted. Finally, the effect of the maintenance of this approach on progress in understanding the currency market is discussed.

### **The Fundamentals and benevolent markets**

It appears that the term Fundamentals was not widely used in foreign exchange literature until very recently. An examination of secondary sources surveying economic thought from Ancient Greece through Medieval scholasticism shows an increasing instance of discussion of currency prices, but there is no evidence that economic thinkers believed Fundamentals in the modern sense existed (Einzig, 1962; Kleiman, 1997; Langholm, 1992; O'Brien, 1968). Even though the origins of many modern controversies in exchange-rate theory can be identified within Mercantilism and Classicism, nothing like the Fundamentals can be discovered without an overly generous interpretation (Einzig, 1962; Hutchison, 1988; Nachane and Hatekar, 1995). In fact, one must move forward all the way through World War II and the collapse of Bretton

<sup>1</sup> Unfortunately, some heterodox economists have also adopted the term Fundamentals without correcting any of the problems associated with neoclassical use of the concept. Given both the possibility of confusion and the small likelihood that Post Keynesians, for example, really intend to adopt an approach similar to that of economic orthodoxy, I would strongly urge that "Fundamentals" (except in reference to the neoclassical view) be avoided entirely.

Woods to find the term coming into frequent and common usage. It appears to have assumed its current importance in the 1980s.

That it did so then is directly related to the troubles economists were having in constructing empirical explanations of exchange-rate movements. No mainstream model was (or has been) able to consistently outperform a random walk (see Meese and Rogoff [1983] for the seminal work in this area). As a result, economists began referencing the determinants of exchange rates in an indirect, even vague, manner. The term they adopted was the "Fundamentals."

Although the choice was certainly influenced by the popular lay connotation of the word, the fact that it was already employed in the financial industry must also have been important. However, the economic use of the term often varies somewhat from the financial. In the latter it is "analysis of the balance sheet, income statement, and other basic economic and managerial data of companies in order to forecast their future stock price movements" (*Barron's Dictionary of Business and Financial Terms*, 1987). Hence, the Fundamentals are a particular means of predicting asset prices. In economics, however, they are understood to be *determinants* of the price in question. These two are not mutually exclusive, of course, as one would endeavor to make the forecasting method mimic the actual process as closely as possible. Unlike economists, financial analysts do not appear to be making the key normative assumption that the Fundamentals *do* and *should* drive prices.<sup>2</sup>

This different take on the role of Fundamentals is rooted in the core concepts of neoclassicism. As previously suggested, in orthodoxy the Fundamentals have come to be associated only with those phenomena whose impact is thought to be welfare enhancing. This has created both the unifying theme and the obstacle to progress in this area. That exchange-rate theorists have adopted this approach is a function of the rationality assumption. Orthodox economists have traditionally placed a great deal of weight on the associated deduction that no one is better placed to make utility-maximization decisions for economic agents than the agents themselves.<sup>3</sup> They further argue that since markets allow the most freedom for individuals to act, markets are therefore the most likely form of economic organization to yield optimal outcomes. Though by their own admission, this is only true under certain restrictive conditions and requires a peculiar definition of "optimality." It has nevertheless crept into neoclassical thought that markets, because they allow the

<sup>2</sup> Though one does find sentiments similar to economists' in financial *scholarship*.

<sup>3</sup> For related reading see Boulding (1952), Heaps (1989), and Simon (1997).

free expression of rationally driven individual wants, yield socially useful outcomes.<sup>4</sup> Not surprisingly, economists have also approached exchange-rate theory with this same bias toward the conclusion that free markets will be the best place to maximize social welfare. Hence, the association of the Fundamentals with only *benevolent* variables is simply another manifestation of this line of thinking.<sup>5</sup>

### The Fundamentals: examples from the literature

Before exploring the impact of this bias on the ability of mainstream economists to explain exchange rates, the various approaches to defining the Fundamentals are surveyed. In the process it will be shown that each results from orthodoxy's bias toward market solutions and its inability to make approaches based on that preconception fit the facts of the real world.

There are at least eight (often overlapping) means of explaining the Fundamentals. By far, the most common is to define them as those variables suggested by *economic theory* (De Grauwe and DeWachter, 1993, p. 354; Dixon, 1999, p. F652; Frankel and Froot, 1986, p. 24; Liu, 1996, p. 363; MacDonald, 1999, pp. F673–F674; MacDonald and Taylor, 1992, p. 25; Meese and Rose, 1990, p. 192; Neely, 1997, p. 23; Pentecost, 1991, p. 81; Pilbeam, 1994, p. 66; Rogoff, 1999, pp. F655–F657; Takagi, 1991, p. 179; Taylor, 1995a, p. 41; Taylor, 1995b, pp. 1–2; Taylor and Allen, 1992, p. 304; Visser, 1989, p. 42). Ronald MacDonald and Mark Taylor write in their survey of exchange rate economics, for example, that Fundamental levels for currency prices are those “predicted by economic theory” (MacDonald and Taylor, 1992, p. 25). Similarly, Keith Pilbeam's explanation amounts to “economic fundamentals (are) derived from modern exchange rate models” (Pilbeam, 1994, p. 66). And Taylor calls the Fundamentals, those variables derived from “the four major exchange rate models based on conventional macro fundamentals: the monetary model, the sticky-price monetary model, the equilibrium model, and the portfolio balance model” (Taylor, 1995b, p. 2). Though at other times the references are less explicit, the fact remains

<sup>4</sup> It would not be fair to say that all orthodox economists believe this with equal fervor. Nevertheless, it forms an important core of their approach to economics.

<sup>5</sup> A number of other authors have made similar arguments with respect to neoclassicism's faith in beneficent markets (see, for example, the opening chapter of Paul Davidson, 1994). None has, however (to my knowledge), connected this characteristic of neoclassical thought with Fundamentals or exchange rates.

that as there is no single model that has either been shown to effectively explain exchange-rate movements or been universally accepted on the grounds of theory (Taylor, 1995a; 1995b), this can hardly be considered an unequivocal definition.

The authors concerned certainly realize this, and so it must be inferred that their intention is not to associate Fundamentals with a particular, known set of variables, but instead with some feature or characteristic shared by the various models. The most likely candidate for that commonality emerges upon consideration of the fact that there is *no* neoclassical exchange-rate model that does not predict (at least over the long run) self-correcting and beneficent tendencies of some sort for the currency market (in the absence of government intervention; Harvey, 1996; MacDonald, 1995; and Shaikh and Antonopoulos, 1998). Hence, the point must be to associate the Fundamentals with this common result.

All other definitions of the Fundamentals are somehow derivative of the above in the sense that they accept the basic logic of those propositions. There are, for example, analyses specifying the Fundamentals as the variables leading to *efficient markets* (Pilbeam, 1994, p. 68). Here, the link to optimality is made obvious. There are also articles in which the Fundamentals are associated with the *long run* (Copeland, 1989, p. 167; MacDonald and Taylor, 1992, p. 26), or *equilibrium* (De Grauwe and Dewachter, 1993, p. 354; Neely, 1997, p. 36; Wallace, 1979, p. 1) level of the exchange rate. Ronald MacDonald and Mark Taylor argue, for example, that as market participants tend to "focus more on fundamentals in longer horizons . . . that more attention might fruitfully be paid to modeling the fundamental determinants of *long run* exchange rates" (1992, p. 26).<sup>6</sup> Paul DeGrauwe and Hans Dewachter write that "fundamentalists compute the *equilibrium* value of the exchange rate" (*italics added*; 1993, p. 354). In each, the implication is that though there may be imperfections in the real world that prevent currency prices from creating efficient outcomes in the short run, the economically logical levels (those suggested by theory) will be achieved eventually.

Two more methods of defining the Fundamentals are to contend that they are the *underlying determinants* of the currency price or those factors reflecting the *strength of the economy* (Olsen Associates, 1995, p.

<sup>6</sup> MacDonald and Taylor are also trying to imply that there is little point in modeling non-Fundamental movements of currency prices. This sentiment is a function of the belief that "economic" analysis equals analysis based on their definition of the Fundamentals, something to which I shall return below.

3; Pentecost, 1991, p. 72; Schmidt, 1978, p. 97; Taylor, 1995b, p. 30; Taylor and Allen, 1992, p. 304). There is rarely an elaboration of what either of these is meant to imply in terms of specific variables, and in those few cases where a list is offered a proof of why those particular variables should fit that characterization is conspicuously absent. Despite this ambiguity, it is nevertheless clear that Fundamentals are once again being linked to strong, equilibrating natural forces, as Wilson E. Schmidt's reference to non-Fundamental exchange rate movements as "disproportionate" suggests.

Perhaps the most interesting subsidiary approach is which, unlike most of the above, consciously associates the Fundamentals with an *ideal state* (though not specifically efficient markets as above; Neely, 1997, p. 23; Taylor, 1995a, p. 42; Visser, 1989, p. 24). Such a view is revealed, for example, in Hans Visser's reaction to the alternative view that exchange rates might not be driven by Fundamentals: "We are back with Keynes's *gloomy* view of (in his case, stock) market valuation as a game of musical chairs" (italics added; Visser, 1989, p. 24). Christopher J. Neely, too, writes that if the exchange rate "swings away from fundamental values (it) may discourage international trade and investment by making the relative price of U.S. and foreign goods and investment very volatile" (Neely, 1997, p. 23). And in the final paragraph of a review article in which he must admit that Fundamentals-based models have performed very poorly in explaining real-world currency price movements, Mark Taylor makes the following observation:

But economics has an important normative as well as positive element, and it is clear that in terms of assessing the appropriateness of exchange rate behavior and policy, the macro fundamentals are of supreme importance. Viewed from this perspective, the macroeconomic fundamentals thus provide an indispensable framework for policy debate and analysis. (Taylor, 1995a, p. 42)

In other words, even if Fundamentals do not really determine exchange rates, they are important because they are what economists think *should* do so. These sometimes indirect references are not only closest to the heart of what is really meant by the Fundamentals, but most clearly show that it is indeed "a Herculean task to question what one has been trained to believe in as self-evident verities" (Davidson, 1994, p. 9). Even when their better judgment tells them otherwise, they seem compelled to continue to embrace the benevolent-markets view.

Another popular means of identifying the Fundamentals that varies somewhat from the aforementioned is *by what they are not* (Frankel and



Froot, 1986, p. 24; MacDonald and Taylor, 1992, p. 25; Olsen Associates, 1995, p. 3; Pilbeam, 1994, p. 66; Takagi, 1991, p. 179; Taylor, 1995b, p. 9; Taylor and Allen, 1992; Visser, 1989, p. 24). Based on the work of Jeffrey Frankel and Kenneth Froot, the practice in this line of research is to differentiate between foreign currency market participants focusing on the Fundamentals versus those relying on technical analysis:<sup>7</sup>

Fundamentalists think of the exchange rate according to a model—say, the Dornbusch overshooting model for the sake of concreteness—that would be exactly correct if there were no chartists in the world. Chartists do not have fundamentals such as the long-run equilibrium rate in their information set; instead, they use autoregressive models—say, simple extrapolation time series of the exchange rate itself in the information set. (Frankel and Froot, 1986, pp. 24–25)

See also

Technical, or chartist, analysis of financial markets involves providing forecasts of asset prices or trading advice on the basis of visual examination of the past history of price movements, perhaps with the aid of certain quantitative summary measures of past price movements such as “momentum” indicators (“oscillators”) or moving averages, but without regard to any underlying economic, or “fundamental,” analysis. (Taylor and Allen, 1992, p. 304)

Hans Visser takes a similar stand, explaining that exchange rates driven by “whims, i.e., my expectation of what other people’s expectations will be” (Visser, 1989, p. 24), are not “firmly anchored in what are commonly called the *market fundamentals*” (Visser, 1989, p. 24). Hence, whatever the Fundamentals are precisely (something of which they are obviously unsure), these authors are arguing that they are *not* associated with what we consider charting or technical analysis. The implication is, as always, that Fundamentally determined rates are “good,” as revealed, for example, by Hans Visser’s use of the term “whims” as an antonym for “market fundamentals” (Visser, 1989, p. 24).

The final method to be mentioned here is somewhat different in that it is a technique more than a definition. It is extremely common in the literature to define the Fundamentals *by example* (Flood and Rose, 1999, p. 662; Meese and Rose, 1990, p. 192; Neely, 1997, p. 23; Szakmary and Mathur, 1997, p. 514; Takagi, 1991, p. 179; Taylor, 1995b, p. 1;

<sup>7</sup> Note that this is in some respects a return (at least a partial one) to the original, financial meaning of Fundamentals.



Visser, 1989, pp. 24, 42). The pitfalls of such an approach are clear. What if astronomers defined “planet” by example? The result might be something along the lines of, “A planet is a heavenly body like the Earth, Mars, or Venus.” This appears to be a reasonable and useful method until a previously uncategorized phenomenon is encountered. Where, for example, does our moon fit into this scheme? It is very much like the Earth, Mars, and Venus in most respects (certainly more so than the Sun or an apple), but there is a critical difference not apparent in the definition by example—it revolves around a planet and not a star. Thus, definition by example, rather than by function, is a decidedly unscientific method (Paul Davidson has argued similarly with respect to our standard money supply definitions).

Nevertheless, definition by example is very common in exchange rate literature:

We also attempt to determine if the trading rule returns are temporarily associated with changes in macroeconomic fundamentals and financial variables *such as GNP, inflation, money supply, foreign trade, interest rates, and stock prices*. (Szakmary and Mathur, 1997; italics added)

The aim of this paper is to assess the importance of macroeconomic fundamentals—*such as money supply, output, interest rates, and so on*—for exchange rate movements and in particular for the modelling of exchange rate movements. (Taylor, 1995b, p. 1; italics added)

There is little evidence that conclusively links the bilateral exchange rates of typical OECD countries to “fundamental” macroeconomic determinants of exchange rates, *such as money, output, relative prices, or interest differentials*. (Meese and Rose, 1990, p. 192; italics added)

In the preceding cases the exchange rate was firmly anchored in what are commonly called *market fundamentals*, which may be taken to mean *such variables as money supplies, interest rates, real incomes, price levels, and trade balances*. (Visser, 1989, p. 24; second italics added)

These are by no means isolated instances, and even the few examples here show the ambiguity and variety found.

It must be stressed that, in all the above cases, the explanation of Fundamentals offered is rarely more than a sentence or two (though it is not uncommon to find two or three of the above definitions used in combination). The uninitiated, trying to sift the literature for a working definition must find the diversity and lack of specificity bewildering. The fact that mainstream economists do not view this as a problem adds to the mystery. It is only solved when one understands that the thread running throughout neoclassical exchange-rate theory is the belief that market

forces must, at least in the long run, yield socially useful outcomes and that the adopted name for that set of determinants in this literature is the Fundamentals.

### The role of the Fundamentals in guiding research

One of the strongest consequences of the above definitions taken as whole, is the implication that a theory is not "economic" unless it supports the free-markets-as-benevolent assumption. If each of the above approaches is acceptable among mainstream economists (and I know of no example in the literature of one such scholar taking issue with another's Fundamentals), then the sets representing the variables implied by each must be identical. Taking this one step further, one can conclude that since they believe the Fundamentals are both those variables suggested by economic theory and those leading to efficient markets and an ideal state, orthodox economics must view theories leading to less than ideal states (i.e., based on non-Fundamentals) as outside economics per se. Indeed, such an effort in deduction is unnecessary as Eric J. Pentecost states openly:

if market participants' expectations are driven by charts, then economists *clearly* have little if anything to contribute in the short run and should concentrate on developing structural models which can adequately represent the long-run equilibrium exchange rates. (Pentecost, 1993, p. 179; italics added)

In fact, Pentecost is quite right. Neoclassical economists do have little to contribute (at least at present), but not because, as he implies, the subject matter lies outside of what should properly be considered economics.<sup>8</sup> Post Keynesian researchers take as the focus of their analysis any *Homo sapiens* social behavior associated with the production and distribution of goods and services and the allocation of resources. Anything falling under that characterization is fair game. The rule of thumb used by orthodoxy to determine the range of phenomena worthy of study, however, is how well the sanctioned tools of analysis appear to fit. If those tools are unable to explain the phenomenon at hand, then it must not be economics. Those tools are, of course, based on the assumption of benevolent markets, and therefore the game is fixed.

This principle has been an important force in guiding mainstream research in the post-Bretton Woods era (for surveys of this literature see

<sup>8</sup> One cannot help but wonder how the foreign exchange market, over any time horizon, could be outside "economics."

Harvey, 1996; MacDonald and Taylor, 1992; Pentecost, 1991; Taylor, 1995a; Visser, 1989). Through the 1970s to perhaps the mid-1980s, most empirical work was aimed at testing macroeconomic models—the monetary approach, the portfolio-balance approach, the Dornbusch model, the Mundell–Fleming model, purchasing power parity, and so forth. As previously suggested, each of these views of exchange rate determination assumes at its core that market processes are efficient and that optimality is achieved, at least in the long run. Very little success was had, yet suggestions that the models might be flawed were few and far between. Such was the faith in the validity of the theories that the consensus that emerged held that the missing factors were effective data sets and sufficiently rigorous testing methods.

There was, however, a brief period during which it appeared that neo-classicism had experienced an epiphany. In the mid- to late 1980s, mainstream scholars decided to move in a new direction and test some of their microeconomic assumptions about agents' behavior (Meese and Rogoff [1983] played an important role in taking economists to this conclusion). This, they hoped, would reveal the source of their earlier macro-level problems. Rational expectations and market efficiency (concepts again closely linked to the markets-as-benevolent bias) came under particular scrutiny, most often being tested via the use of the newly-available surveys of market participants' currency forecasts.

Once again, the orthodox approach was found seriously wanting (as they freely admitted). Test after test rejected both rational expectations and market efficiency, and by the 1990s, orthodox exchange-rate scholars had reached an important crossroad (Dominguez, 1986; Madsen, 1996; Sobiechowski, 1996; and Takagi, 1991). One would suspect that the rejection of rationality would seriously weaken the markets-as-optimal view and force these economists (who it must be admitted were very courageous to place one of their core concepts under such scrutiny) to develop analytical tools consistent with their newfound knowledge. But that is not what resulted. Instead, orthodoxy has taken Pentecost's route and decided that "irrational" behavior (by their definition of rationality) lies outside the realm of economic inquiry.

Today, mainstream exchange-rate theorists are in search of those conditions under which their theories work best. Most have accepted that they are unable to explain short-term movements (a time horizon that can represent periods as long as a year), and have therefore moved to the long run as being most "economic." Of course, the theories do not test terribly well there, either, except for nations experiencing "pathologies" (Taylor, 1995b, p. 28).

This too is a function of the Fundamentals-as-benevolent bias. The latter has led neoclassicists to ignore the role of portfolio capital flows in the determination of currency prices. In orthodoxy, financial capital is assumed to passively serve the rationally derived needs of the real side of the economy. There is, therefore, little need to consider its role independently. Speculative activity moving against the tide of the real side of the economy is punished by losses. Those moving with it are rewarded by profits. Once again, the invisible hand is guiding those driven by greed and self-interest to unwittingly act for the greater good. Hence, in a world where capital flows have come to dominate both currency markets and headlines, orthodoxy has yet to attempt an explanation of foreign exchange prices that makes an honest effort to incorporate the impact of portfolio capital flows (Harvey, 1996). Despite all the apparent change of direction in the 1990s, progress has all but stopped. The same models are being tested ad nauseam, with the same dismal results. Nothing will change until the Fundamentals are rejected as the core explanation.

## Conclusions

The fact that the Fundamentals are defined halfheartedly, and in such a variety of manners, is a function of the combination of the benevolent-markets bias and the difficulty economists have had in explaining exchange rates within that constraint. This has created the single greatest obstacle to understanding currency price determination. It remains a mystery to me why the object of our endeavor cannot simply be to understand how rates are determined *as they are*, without regard for how the answers fit our preconceptions. The object of our analysis should be to discover the premises that are warranted by our study of the real world and then to simply let the conclusion follow. Instead, neoclassicism unwittingly *begins* with the conclusion and then tries to find a means of justifying the premises that lead to it (while simultaneously damning as unscientific all those studies allowing for a different diagnosis). The future is not entirely bleak, though, as there are researchers willing to take on the task of explaining the "noneconomic" behavior of international financial markets (see, for example, Flood, 1991; Harvey, 2000; and Shaikh and Antonopoulos, 1998). As it stands, however, the vast majority of the scholarly resources in this area are invested in efforts not directed toward explaining the behavior we observe day-to-day in world currency markets, but to discovering the circumstances under which the Fundamentals as currently defined might finally be relevant.

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