

# **Review of exchange rate theories in four leading economics textbooks**

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## **Abstract**

In this paper, those parts of four leading economics textbooks are reviewed that deal with exchange rate theories. The books used are Krugman/Obstfeld/Melitz, Blanchard/Johnson, Mankiw/Taylor and Samuelson/Nordhaus. This exercise is novel, as it is seemingly a standard attitude in the economics profession to refrain from discussing textbooks in academic journals, with few exceptions. This implies that there is no academic discourse on these books or specific parts of them, although textbooks are immensely important in shaping opinions for generations of economics students all over the globe.

The theoretical background for this exercise is the fact that exchange rate theory is one of the weakest parts in the mainstream/neoclassical or “New Keynesian” stream of thought. It is now widely accepted that exchange rates cannot be forecast better than random walk in the short and medium run. For the long run, however, most authors stick to the old purchasing power parity theory whose empirical validation is not much better than for the theories used for the short run, mainly interest rate parity theory. The textbooks reviewed follow the old theories, ignore other approaches and refrain from systematically checking empirical evidence. Yet, it is amazing to see that they differ considerably, even though they remain within the leading theoretical paradigm.

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Foreign exchange markets are by far the biggest global financial markets. The dollar-euro market is the most voluminous one. On all forex markets on the globe, the daily transaction volume in 2013 was US-\$5.3 trillion, a multiple of daily transactions of goods and services. Not only trade is influenced by exchange rates, even more the pricing of financial assets. Exchange rate changes can lead to financial and full-blown balance of payment crises, but they can also support employment, output growth, economic development and subsequently the quality of life. After the demise of the post-war Bretton Woods currency system flexible, i.e. market determined, exchange rates predominate in the world economy, especially among developed countries. Among empirical researchers on exchange rates there is a broad consensus that exchange rates cannot be forecast in the short and medium term better than random walk. Bluntly said, realistic forecasts are impossible, and the economics professions is unable to explain exchange rates, one of the most important prices in modern economies. For the long run, opinions about explanations and trends differ. Obviously exchange rates are enigmatic or chaotic. Mainstream economics is in deep crisis regarding exchange rate theory. In this essay, I want to find out how leading textbook authors deal with this issue, since textbooks in this profession are supposed to offer canonical wisdom to economics students across the globe.

I discuss here four textbooks with a considerable international market share for economics textbooks (with two Nobel laureates and two former chief economists of the International Monetary Fund among the authors), namely

Paul Krugman, Maurice Obstfeld, Marc J. Melitz, International Macroeconomics, Theory and Policy. 10th edition, Prentice Hall 2012

Olivier Blanchard, David R. Johnson, Macroeconomic, 6th edition, Prentice Hall 2013

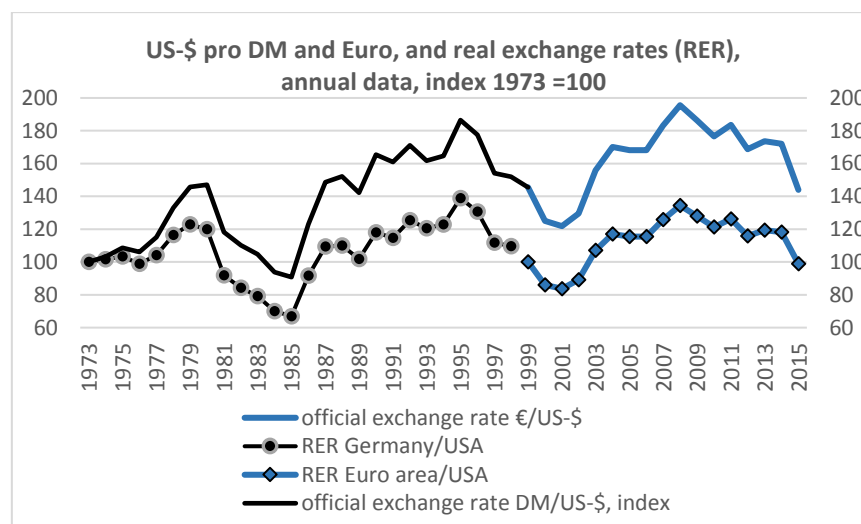
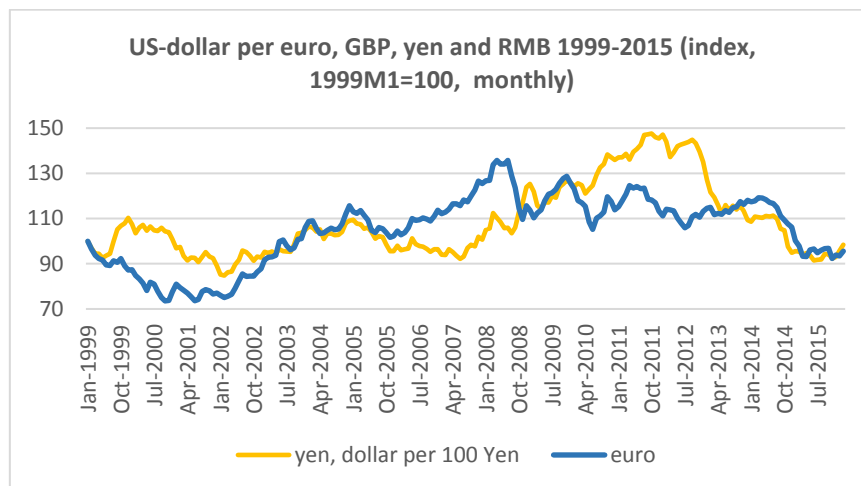
N. Gregory Mankiw, Mark P. Taylor, Economics, 3rd edition. Cengage Learning EMEA 2014, Andover, Hampshire, UK

Paul A. Samuelson, William D. Nordhaus, Economics, 19<sup>th</sup> edition, McGraw-Hill Companies, New York.

The first two are at an intermediate level, the last two for undergraduates. I will review the underlying theories, compare theoretical differences, check whether different theories are presented and whether up to date empirical research is absorbed. My result is clear-cut: we need new textbooks with regard to exchange rates, a core element of international economics.

### Box 1: Exchange rate performance in the long run

Before the review begins, let us see what needs to be explained, namely, as a representative example, the performance of exchange rates on the two biggest foreign exchange markets after the breakdown of Bretton Woods. The first graph shows monthly rates for the Dollar-Yen and the Dollar-Euro rates since 1999, the second graph the long haul since 1973 for the DM and the Euro against the Dollar, additionally the inflation adjusted real rate.



Source: OECD.Stat, AMECO; own calculations

We see massive movements up- and downward with long cycles. Volatility of the real exchange rates is high but not as high as of the nominal ones. Daily rates would show much more volatility. Equilibrium in the sense of static stability periods or a clear trend is not visible (for details, see Priewe 2016). Explaining this performance is the challenge exchange rate theory is facing.

**Krugman, Obstfeld and Melitz**

The bulky book deals with exchange rate theories on 225 pages, almost 30% of the book. Further chapters on the history of the world monetary system, optimal currency areas and the European Monetary Union add to the theories. The latter is completed with a remarkable analysis of the recent euro crisis. The book requires undergraduate knowledge in micro- and macroeconomics.

Exchange rate theories are covered in three chapters. Chapter 15 explains the basic concept for the short-run horizon, the interest rate parity theory (IRP). In chapter 16 the long-run equilibrium on the forex market is analysed, focused on a critical analysis of the purchasing power parity theory of exchange rates (PPP); this theory is partially replaced by a novel, quite unusual approach coined “general model of long-run exchange rates” (pp. 464ff.). “Long run” means in this context a general macroeconomic equilibrium with full employment and flexible prices. The short run is about a partial equilibrium of both the money and the forex market, in the framework of a macro disequilibrium with fixed or sticky prices and unemployment. All this deals with fully flexible exchange rates. This approach implicates that the short run is only a temporary disequilibrium that leads after some time to a general macro equilibrium. The short-term disequilibrium is healed eventually by market forces.

Like in many US textbooks, readers find many illustrative examples, boxes, charts, case studies, excerpts from newspaper articles etc. The historical and institutional environment is addressed in the following chapters, including the financial crisis of 2008-9 and the euro crisis.

What looks like a perfect textbook satisfying all substantial and pedagogic requirements turns out to be highly problematic. What is offered here is a synthesis of neoclassical provenience which tends to combine different strands of theory for the long run. Views explicitly relating to Keynes and Keynesians are not mentioned, e.g. the role uncertainty, neither approaches from behavioural finance (e.g. De Grauwe/Grimaldi 2006; Kindleberger 2000; Schulmeister 2009; Frankel/Froot 1990; Neely 1997; Menkhoff 1998 among many others). Results from empirical research of the last few decades are systematically excluded in these three chapters. The concepts of the authors are mainly rooted in so-called New Keynesianism, even though this background is not mentioned explicitly. In this view, the neoclassical general equilibrium theory is valid in the long run, including the theory of rational expectations. Since goods and labour markets are inflexible in the short run, equilibrating mechanisms are inhibited. Therefore unemployment, inflation, balance of payments disequilibrium and exchange rates

which overshoot their equilibrium values can emerge. In the short term, Keynesian countercyclical monetary and fiscal policies are advised, for the long run they are ineffective and unnecessary.

Now we turn to the core of the exchange rate theory of Krugman et al. (KOM in the following). First of all, the forex market is rightly conceived as an asset market. Foreign exchange is part of financial assets. The real (inflation adjusted) return on forex depends on *actual* interest rates for home and foreign currency and on *expected* exchange rate. If expectations regarding the future exchange rate are given, the exchange rate on spot markets is determined by arbitrage that equilibrates the interest rate differential with the expected exchange rate change. For simplicity, currency premiums (or country-specific risks) are excluded, and assets at home and abroad are considered perfect substitutes. Then the returns on the foreign and the home asset are the same, counted in the same currency, following the law of one price applied to financial assets. Seemingly, this interest rate parity is facilitated by arbitrage across currencies. The authors do not mention speculation, in contrast to arbitrage. Analyzing the short-run equilibrium exchange rate, KOM look at nominal interest and exchange rates. They concentrate on short-term interest rates for deposits up to one year duration. It is not elaborated whose exchange rate expectation is relevant here. Apparently there is only one *uniform expectation* for the future exchange rate, which implies a representative agent. But such an assumption is not mentioned explicitly. Perhaps it is the average of diverse expectations. Readers are kept in the dark about this.

The equilibrium is shown in the following equation, in which  $R$  is the nominal interest rate, suffix  $\text{€}$  and  $\text{\$}$  stand for interest rates in the respective currencies for one-year deposits,  $E\text{\$/€}$  stands for today's nominal exchange rate for the Euro (Dollar pro Euro) and  $E_e\text{\$/€}$  is the expected nominal exchange rate in one year (p. 394):

$$R\text{\$} = R\text{€} + (E_e\text{\$/€} - E\text{\$/€}) / E\text{\$/€}$$

And today's nominal exchange rate is:  $E\text{\$/€} = E_e\text{\$/€} / (R\text{\$} - R\text{€} + 1)$

The second term on the right side of the first equation is the expected exchange rate change. If positive, i.e. an appreciation of the Euro is expected, this expectation feeds immediately into the interest rates, either as a rise in the Dollar interest rate or a fall of the Euro rate. Interestingly, it does not feed directly into an immediate Euro appreciation which is excluded

by assumption of a given future exchange rate. Another tacit assumption is that *unexpected* future exchange rates for the duration of a year do not exist in this framework

Nonetheless, the second equation can be read differently: the expected exchange rate may determine the spot rate, if interest rates are given; at times, expectations may change heavily even in the short or very short term, at other times expected exchange rates may follow the trend of the past and present rate. This would lead us to studying the behavior of FX traders. KOM do not choose this route.

Undoubtedly, the key factor for the exchange rate determination is the expectation of the future exchange rate which is assumed exogenous: "For now, we will take expected future exchange rates as given." (p. 391) One has to conclude that for the short run the forex market equilibrium is then determined solely by interest rate arbitrage. Although readers might be curious to learn what determines exchange rate expectations, they learn some 100 pages further that the "anchor" for expectations is rooted in the model of the long-term exchange rate, which is by definition the long-term equilibrium rate (p. 471). This is apparently the secret that makes expectations stable. In other passages it is stated that expected exchange rates depend on the future determinants of interest rates, such as inflation, monetary policy etc. Overall, it remains opaque what determines today's exchange rate expectations.

Before we turn to the long term theory, KOM conclude that the short-term forex market equilibrates also supply and demand for money. Money supply (M1) is conceived as set exogenously by the central bank, while money demand depends on aggregate income and the interest rate. It is surprising that KOM still understand monetary policy as fixing money supply although no major central bank follows this approach, and those that did this officially (like the German Bundesbank until 1998) followed de facto a different practice. Today all major central banks set short-term interest rates and the quantity of money follows endogenously. The authors concede this, but only in a special box on monetary policy in Canada (p. 525), without drawing general conclusions.

The long-term real (inflation adjusted) equilibrium exchange rate is determined by KOM via a mix of PPP and a peculiar non-monetary theory of real exchange rates. As to my knowledge, no one else holds this theory, and the explanations given in the textbook are sparse (pp. 464ff.), without any empirical evidence or references for further reading. PPP theories in its absolute and also in its relative form are rejected at least for the short and medium term, i.e.

that nominal exchange rate changes compensate for inflation differentials although the level of PPP rates may differ. The main causes for the rejection are rigid prices and factor costs as well as high transaction costs which hinder arbitrage on goods markets. Nevertheless, KOM see some truth in PPP in its *relative* form for the long run, if combined with their “general theory of exchange rates in the long run”. In this concept, currencies in those economies tend to appreciate in real terms whose goods face comparatively stronger demand than goods from other economies. If the productivity trend is stronger than in other economies, the currency tends to depreciate, and vice versa. This non-monetary approach is supposed to complement PPP and compensate the latter’s shortcomings. The upshot of this is that the long-term equilibrium real exchange rate is determined by both parity of *real* interest rates (pp. 473 ff.) and a modified PPP. This approach should integrate also the old monetary theory of exchange rates which considers equilibrium real exchange rates as the relationship of the price levels and hence the money stocks between the home and the foreign economy. The grand synthesis approach is poorly explained; there is not even an attempt to provide some empirical evidence for it. Many questions remain open. Not only students will face problems comprehending it.

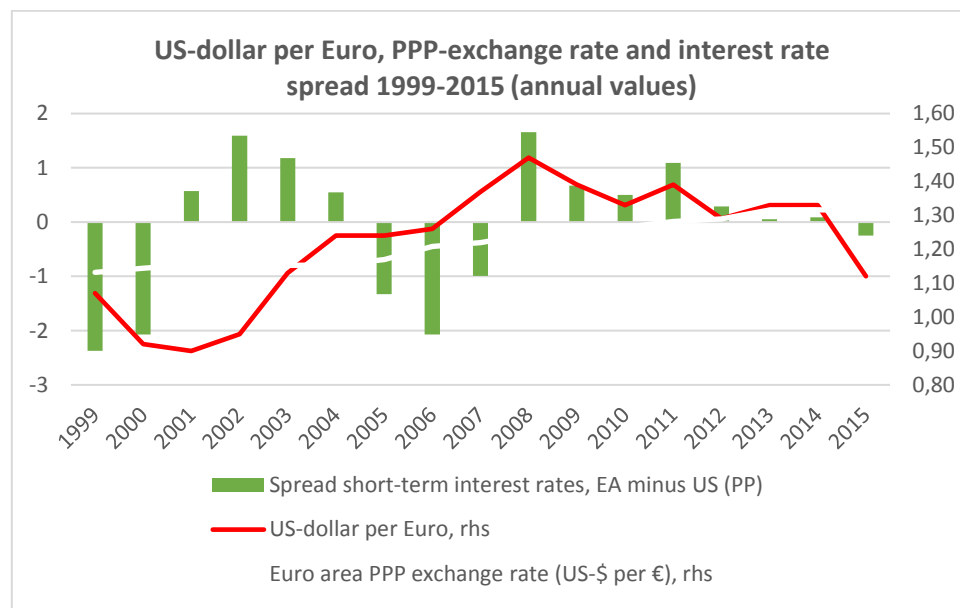
Regarding the short-term equilibrium, the authors avoid explaining the key variable, the prospective exchange rate expectations. If these expectations are the anchor for the modified long-term PPP equilibrium rate, one has to ask why such expectations are not immediately priced into the present spot market although they feed immediately into the present interest rates? The anchor notion implies that exchange rate expectations are stable. Given the enormous volatility of nominal exchange rates on floating forex markets, such a notion is simply way beyond stylized facts. Why should expectations about future exchange rates be uniform among all agents involved? Why does the adjustment of sticky goods prices and wages take on average eight years, as found by econometric research<sup>1</sup>? The standard reasons provided for slow adjustment are not very convincing. Does arbitrage on goods markets implementing the law of one price, following PPP, play any role at all if the transaction volume on the dollar-euro market US-\$1.3 daily, almost fully unrelated to the trade of goods? How can the authors’ combination of short and long-term equilibrium explain the variation of the Dollar-Euro rate from US-\$0.82 to US-\$1.60 per Euro in 2001 and 2008, respectively, similarly on the Dollar-Yen or other market?

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<sup>1</sup> One might questions why price levels should adjust at all.

## Box 2: Exchange rates, interest rate differentials and PPP rates

The graph shows the PPP exchange rate for the Dollar-Euro and the short-term interest rate differential (Euro area – US rate) for the period 1999-2015. In the first phase until 2004 we see a textbook performance, then the interest rate differential drops but the Euro is skyrocketing until 2008. Afterwards the performance is mixed. The deviation from PPP is swelling up and down, in the positive and negative areas, but never exceeded 25 percentage points (based on annual data).



Source: OECD.Stat, own calculations

To demonstrate my point: the Euro appreciated 88% from the low in 2001 to the high in 2008, on average 9.4 p.a. (using daily rates). Assuming that this annual appreciation of the Euro were expected, the interest rate differential would have to be also 9.4 percentage points. But both nominal short- and long-term interest rates between the Euro area and the US differed never exceeded 2.4 percentage points since the advent of the Euro in 1999 (Priewe 2016, p. 42). Using the PPP theory, in whatever variant, would have to explain also the question why such strong deviations emerged, and why it took so long to reduce them; neither PPP nor IRP theory explain this. My point here is: KOM's favourite theories are not even in line with stylized facts of exchange rate performance, let alone with results from meticulous empirical investigations. In other words, the exchange rate volatility and deviations from PPP among the OECD countries have remained strong and by and large similarly high since the end of the Bretton Woods system, but the inflation and interest rate differentials converged strongly. There is an obvious misfit of interest rate differentials and exchange rate volatility, compared to what IRP would suggest. This reduces the explanatory power of IRP even further.



When addressing exchange rate volatility, KOM draw implicitly on Dornbusch's model (1976) of overshooting (p. 435ff., without mentioning Dornbusch). This theory is built in the framework of PPP and the monetary theory of exchange rates which KOM in the main do not want to follow. Rogoff, erstwhile a fervent follower of Dornbusch's model, has long ago considered this theory as elegant but useless in explaining the reality (Rogoff 2002). At times, they mention that expectations of future exchange rates also depend on perception of "news" by traders.

In my opinion, KOM make a crucial mistake in their short-term analysis. If one drops the assumption of given present expectations for future exchange rates, then the actual spot market rate depends essentially on changing expectations. If these expectations are not anchored in some unclear fundamentals and if they are competing and not uniform among market agents, differing expectations will be traded on forward markets. Agents bet on different forward rates, meaning they speculate (the term "speculation" is not used for the short-term exchange rate theory in this book, only for the analysis of speculative attacks on fixed exchange rates). Thus spot market rates follow forward rates, and the difference between forward and spot rates cannot be explained by the interest rate differential as stipulated by the covered IRP theory. This means that the present forward rate deviates from the actual exchange rate in the future, hence the former is not a reliable predictor of the latter. Speculation is mostly practiced in the form of technical trading of so-called chartists on forex markets. All this is fairly well elaborated in exchange rate research based on behavioural finance and Keynesian theories of expectations (for a critique of IRP see also Harvey 2004, Priewe 2016, pp. 31ff.). Two German language textbooks (Heine/Herr 2013, pp. 697-708) and Bofinger (2011, 526-546) offer on a few pages precisely those explanations which are not provided by KOM on several hundred pages.

KOM pay no or little attention to the reality of forex markets, and they refer seldom to econometric and other empirical findings or at least stylized facts. In their exposition of the short-term equilibrium exchange rate theory, based on their version of IRP, they keep quiet on the innumerable analyses that had shown that the IRP in all variants cannot explain short-term exchange rates better than random walk (first Meese/Rogoff 1983 and 1998, more recently Rossi 2013 and Baille 2013 for summaries). But KOM's theory was precisely developed for the short term, and it is the cornerstone of their exchange rate theory!

It comes then as a big surprise that KOM indeed refer to the empirical literature mentioned, but not less than 250 pages later in a short section on the efficiency of forex markets (pp. 657-661). There they report about this literature in a few paragraphs conceding that empirical research found that IRP can neither forecast the direction, i.e. the sign, of exchange rate changes nor the intensity of change. It is also admitted that the assumption of country-specific risk premiums cannot rescue IRP, neither can imperfect substitutability of assets. They even conjecture that exchange rate volatility might be exuberant to an extent not to be explained by the model of overshooting exchange rates. Moreover, they raise the prescient question whether exchange rates might perhaps have a “life of their own” which cannot be explained by conventional models and methods (p. 660). KOM briefly discuss the empirical findings and argue they are not yet conclusive, and expectations cannot be measured. Having reported about this research which would, if true, completely undermine their theories, readers may wonder why they don’t question their whole long-winding exchange rate theories if the latter are not even in line with stylized facts. Apparently KOM seem to doubt at times the efficient market hypothesis of Eugene Fama for forex markets, but in other sentences they reject doubts. In the end they maintain all of the underlying theory of expectations which is intertwined with KOM’s exchange rate theory for the short and the long run. KOM close this short partly self-critical passage with the cynical call for learning from old theories but being open-minded for new insights (p. 661). Scientific methodology stipulates that theories cannot be verified, they can only be falsified. KOM seem to reject falsification over more than three decades and hope for future econometric falsification of the already existing falsification. This is attempted immunization against evidence and critique by calling the existing evidence “ambiguous” - after a few pages reviewing empirical findings that overwhelmingly do not back the 225 pages of theories presented before this passage.

The authors are aware that the issues at stake are big:

“A judgement of market failure, on the other hand, might imply a need for increased foreign exchange intervention by central banks and a reversal of the global trend toward external financial liberalization. The stakes are high, and more research and experience are needed before a firm conclusion can be reached.” (p. 661)

And:

“Tests of excessive exchange rate volatility also yield a mixed verdict on the foreign exchange market’s performance. Together with the recent history of financial crises, this is not good news for those who favour a pure laissez-faire approach in financial globalization.” (p. 662)

These few sentences stand against what the authors present in their exchange rate theories. It seems they serve as a fig leaf.

### **Blanchard and Johnson**

The 600 pages book is an ambitious introduction into macroeconomics. On nearly 50 pages the authors (henceforth B&J) deal with exchange rates, scattered over different chapters. In those macroeconomic models introduced by B&J, exchange rates are important building blocks, similar to KOM's textbook. Blanchard is also a proponent of New Keynesianism. Until recently he was chief economist of the IMF, predecessor of Obstfeld.

The book also discusses different theories and models of exchange rates, but similar to KOM from a limited spectrum of the mainstream (Neoclassics, Monetarists and New Keynesians). Again illustrations, boxes, examples and case studies are amply interspersed. Exchange rates are explained, integrated in macro models, mainly the well-known Mundell-Fleming and the ISLM model on which the former rests. The discussion on flexible and fixed exchange rates is added, also the limitations of macroeconomic policies in open economies. Despite many similarities with the textbook from KOM, there are serious differences.

B&J follow also the IRP theory which is considered key for the short and medium term. PPP theory is briefly mentioned but rejected as it cannot explain empirically observed exchange rates, as B&J hold. For the long term the authors have not much on offer. Some remarks can be interpreted as limited acknowledgement of PPP. Besides, B&J hint to the role of monetary and fiscal policies and to the necessity that central banks have to have a look at current account balances. These remarks could be interpreted that in the long run policies play a role in guiding exchange rates toward equilibrium, but it is said not explicitly. If it were meant this way, B&J would implicitly concede that forex markets alone cannot find and sustain equilibrium exchange rates. The long-run theory of real exchange rates of KOM is not even mentioned by B&J. So the question remains what the long-run equilibrium is for them.

The core of B&J's explanation of exchange rates is IRP theory. The actual nominal exchange rate on spot markets is a function of the ratio of domestic and foreign interest rates and of the expected exchange rate. In contrast to KOM and many others, they do not use actual but *expected* interest rates at home and abroad (p. 476ff.), and they assume that the expected

future exchange rate changes permanently, in contrast to KOM. If today's one-year nominal interest rate  $i_t$  is dependent on the ratio of the home and on the foreign interest rate and the expected exchange rate in  $t+1$ , B&J write:

$$E_t = (1+i_t)/(1+i_t^*) E_{e(t+1)}$$

$$\text{And: } E_{t+1} = (1+i_{t+1})/(1+i_{t+1}^*) E_{e(t+2)}$$

$E$  is the nominal exchange rate,  $t$  the period,  $*$  denotes "abroad", the suffix  $e$  stands for "expected". Their clue is now that  $E_{e(t+1)}$  is determined by next years expectations  $E_{e(t+2)}$ , and the latter by expectations in the third year and so on, and hence also by  $i_{e(t+n)}$ . All expected future interest and exchange rates feed immediately into today's spot rate. Note that the traditional causal interpretation of IRP is such that the present exchange rate is given, interest rates are set by central banks and domestic money markets, and the expected future exchange rates is the *result* of the present variables mentioned. B&J see a different causality that starts from the expectations of future variables and ends at the present exchange rate. This gives much more weight to the role of expectations.

This approach shows uncertainty of expectations potentiates instability of exchange rates since future exchange and interest rates are not known; future interest rates depend partly on future inflation and future monetary policy, both of which are not easy to forecast. Although B&J follow explicitly the theory of rational expectations, and even dedicate some 100 pages to this theme, they cannot explain expectations of prospective interest and exchange rates. But their presumption is that such rational and uniform expectations exist. They point to actions and decisions of market participants which influence growth, inflation, monetary policy and interest rates. The volatility of exchange rates comes precisely from the instability of these expectations, B&J argue. The "anchoring" of short-term exchange rates in stable long-term fundamentally determined exchange rates do not seem to exist in B&J's model., but finally the invisible hands of the markets are incorporated in the hands of the traders and their mindset.

Expectations on interest and exchange rates come from myriads of information that is gathered and interpreted by market participants. Existing information is already priced in, and all new information that pops up is used to correct or change past expectations. This is the "news approach" to exchange rate formation. Fishing permanently for new relevant

information on future exchange and interest rates is conceived as a rational response of market agents on forex markets. This way, they search for rational expectations and by trial and error they eventually approach them. However, empirical research on the behaviour of forex traders show that traders seldom use information on fundamentals, and furthermore, it is not always clear what the relevant fundamentals are; often trashy or arbitrarily selected short-term information is used, and interpretations of data differ (cp. Ehrmann/Fratzscher 205). "Irrational speculation" is brushed aside by B&J as an outdated theory. In doing so, they make the seemingly irrational, chaotic behaviour of forex traders look like a rational discovery process. Thus rational expectations return through the backdoor. That the expectations are rational is not proven by B&J, it is a mere assertion.

Regarding the exchange rate volatility after 1973, B&J write:

"For some time, the fluctuations were thought to be the result of irrational speculation in foreign exchange markets. It was not until the mid-1970s that economists realized that these large movements could be explained, as we have explained here, by the rational reaction of financial markets to news about future interest rates and the future exchange rate. This has an important implication: A country that decides to operate under flexible exchange rates must accept the fact that it will be exposed to substantial exchange rate fluctuations over time." (p. 478)

Do the authors really want to tell us that the 88% appreciation of the Euro against the Dollar 2001-2008, mentioned above, was such a "substantial" fluctuations needed to search for the true expectations? Were they not, on all counts (interest rates, PPP, current accounts, etc.) distortionary movements of grand scale market failure?

Since B&J interpret IRP as totally dependent on expected exchange and interest rates, they implicitly depart from the assumption of arbitrage that equalizes returns on the same assets denominated in different currencies. This way, they deviate from the traditional IRP. If they would concede that traders have different and competing expectations, and that there is no representative agent, they would have to conclude that different expectations feed into bets; foreign exchange markets are then huge betting platforms; those who refrain from betting are followers, lemmings that practice technical trading. All this should be considered as speculation, mostly of the destabilizing type, and once excessive deviation from fundamentals is reached, stabilizing speculation sets in. B&J rule out speculation and adaptive expectations, to which traders may cling if forward expectations are very uncertain, as Keynes and many

others contend as a rational response to uncertainty (cp. Keynes on expectations in the “General Theory” 1936, De Grauwe/Grimaldi 2006, Schulmeister 2009, Neely 1997 and for an overview Priewe 2015). In the categories of these analyses B&J – implicitly - rule out noise traders or see at least predominance of “fundamentalists” in the tradition of Milton Friedman. But they do not mention that there are different groups of traders. From their angle, widespread technical trading, based on “trending”, cannot be understood. Critical readers will get the impression that the authors do not properly distinguish arbitrage and speculation, the latter being nourished by all the uncertainties on future expectations which B&J address correctly. Both B&J and KOM do not understand that fundamentals, including interest rate parity, do not govern exchange rates, neither in the short nor in the long run. B&J even suggest that traders can foresee current account imbalances (p. 477).

If this critique is correct, i.e. if IRP fails to explain exchange rates, what then governs exchange rates and their gyrations? Both textbooks dodge this question and are of course blinded in finding answers for questions they don't raise. Therefore, they don't address what is empirically visible and described by many others in great detail: speculation, herding and jumping on bandwagons, technical trading, trending etc. They seem not to care about the microeconomics of forex markets, although it is the New Keynesians who call aloud for micro foundation of macroeconomics. Strongly worded, one might wonder whether the authors really understand what those 100,000 forex traders in the City of London (and more elsewhere) are really doing.

In this review I have not commented on B&J's analysis of flexible and fixed exchange rate regimes or their macro models of open economies. All this draws on the view that flexible exchange rates have proven superior to fixed, similar to KOM. My critique of the disconnect of IRP theories and empirical evidence in KOM's book applies to B&J equally.

### **Mankiw and Taylor**

This book is considered today the most important introductory textbook into economics, covering both micro- and macroeconomics. The authors (M&T in the following) devote some 35 pages on exchange rates, in a remarkably understandable and accessible way of writing. In regard of exchange rates, this textbook differs strongly from KOM and B&J. The authors'

theoretical background is rooted in the monetary theory of exchange rates and the loanable funds theory of interest rates.

M&T follow the PPP theory (pp. 612-636) for the long run, but apparently also, with a few caveats, for the short and medium run.. They write succinctly: "The purchasing power parity theory provides a simple model of how exchange rates determined." (615) Furthermore: "... large and persistent movements of nominal exchange rates typically reflect changes in price levels at home and abroad." (615) Arbitrage on goods market leads to the same price for similar goods across countries, and exchange rates adjust accordingly. Although certain limitations are addressed (like transaction costs, applicable only to tradable costs, deviations with imperfect substitutes), by and large the theory is seen as correct. This implies that exchange rate changes compensate for price level differentials and do not vary stronger – hence nominal exchange rates would have to be rather stable among OECD countries with overall low inflation. Empirical evidence is not provided, let alone a few hints on high inflation countries whose currencies had depreciated roughly in parallel with inflation. There is no differentiation between absolute and relative PPP; in the latter, the level of PPP may differ across countries, but the exchange rate adjustments are in line with inflation differentials.

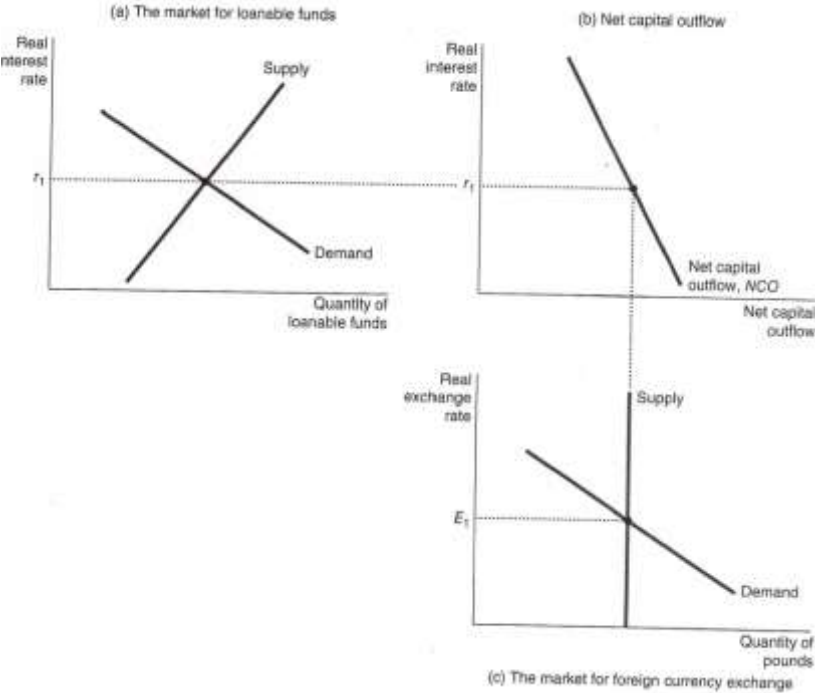
Empirical evidence would have taught readers that strong deviation is the rule, and compliance the exception, at least on the deepest forex markets, the dollar-yen and the dollar-euro market (cp. Priewe 2016). Periods of deviation are often long. This need not imply that PPP is a false theory per se – it could be a sensible target, but floating exchange rates are driven by other factors. Yet, M&T do not discuss such issues.

### Graph 3 ppp

In the next chapter, the authors attempt to explain real (i.e. inflation adjusted) exchange rates in a stunningly simple manner by combining a model of the credit market with a model of the forex market in a two-country-model with flexible real exchange rates (pp. 625-628) and figure 1 below copied from M&T (p. 627). In the credit market equilibrium (panel a), the equilibrium real interest rate is determined by credit supply, understood as a loanable fund from the saving in the period, and credit demand comprising investment and net capital exports (or net capital imports if negative). The latter is by definition of national accounting the balance of the trade balance (if for simplicity trade and current account balances are considered identical). Net exports, corresponding to net capital outflow, is seen as demand for foreign

currency and at the same time supply of domestic currency, say pound. Domestic credit supply is determined by the propensity to save and the interest rate. The intersection of supply and demand for credit determines the domestic equilibrium interest rate, say in UK. The same applies of course for the foreign country, say the US. As mentioned, the demand for dollars, i.e. the supply of pounds, depends only on the interest rate relative to the US interest rate. Lower British rates trigger more net capital exports and hence more supply of pounds on the forex market. The pound supply is independent from the real exchange rate, it depends only on the real interest rate. What determines the demand for pounds which is the same as the supply of dollar? With a lower value of the pound (depreciation), UK's net exports to the US increase; US net imports rise, and they need more pounds to import more from UK. Vice versa with a pound appreciation. Hence the demand for pounds depends on net exports, as a falling function of the exchange rate. Thus the intersection of supply and demand curves for pounds determine the equilibrium exchange rate. In other words, net capital flows, the flip side of net exports, of both countries determine the real exchange rate. Nominal exchange rate changes reflect only inflation differentials. Real exchange rate changes occur due to capital flows, as shown.

Figure 1: The UK credit market (a), net capital outflows (b) and the dollar-pound sterling forex market (c)



Source: M&T, 627 (Figure 29-4)



A real appreciation of a currency makes goods more expensive relative to the foreign country, and thus violates PPP. Therefore the model used by M&T is not fully in line with PPP. Only if net exports respond infinitely elastic on exchange rate changes, PPP would hold perfectly. Therefore PPP is considered a special case of a horizontal demand curve for foreign currency, derived from the net exports as a function of the real exchange rate (p. 626). Readers have to conclude that in reality perfect PPP might not be reached, but deviations are small.

M&T's models explain interest rates in both countries with the loanable funds theory. Therefore real interest rates differ between the countries, that means interest rate disparity is assumed. This is not written explicitly, but it follows out of the short text in chapter 29.2 (on pp. 826ff.), condensed in figure 1). If there were parity, there would be no net capital outflows in their model. Apparently there is no international arbitrage on returns on financial assets in M&T's model. Demand and supply on forex markets are only used for trade. Interest rate parity theory is not even mentioned. Neither are exchange rate expectations addressed. The authors' model world is free of expectations. The contrast of M&T to KOM and B&J couldn't be greater! They even refrain from reasoning why here is arbitrage on goods markets but no arbitrage (let alone speculation) on financial markets. They are quiet on so much what is important.

In the next sections exchange rate changes are discussed. They stem from budget deficits in the home country leading to real appreciation of the home currency. Budget deficits are conceived as less saving, hence less credit supply, inducing higher interest rates (crowding out private investment) and less capital outflows, also less net exports and less demand for domestic currency. In a similar vein they discuss trade policy effects on exchange rates (example an import quota), and exchange rate effects of capital flight. Empirical evidence on exchange rate performance, volatility etc. is not provided. The real world is carefully concealed in this textbook – real exchange rate movements of more than 50% and nominal variations of 100% within a few years, as seen on the dollar-euro market and elsewhere do not fit to M&T's model.

I do not want to defend IRP against M&T; but ignoring financial markets and hushing up those theories which address them provides highly biased knowledge to students. The usage of the loanable funds theory suffers from similar downsides. Modelling savings as credit supply

without mentioning the capacity of banks, or the banking system, to generate finance for investment is more than outdated. It is strongly at odds with modern banking.

It is stunning that this introductory textbook has gained so much worldwide prominence. Its secret seems to be the extreme reduction of complexity, thus the ousting of competing theories and the sparse and often arbitrary inclusion of reality – pedagogics of excessive simplification, with a loss of touch with reality.

### **Samuelson and Nordhaus**

Samuelson's and Nordhaus's textbook "Economics" is the mother of all economics textbooks, now in the 19<sup>th</sup> edition, in the tradition of the 1<sup>st</sup> edition from 1948. Like no other book, Samuelson had shaped the canonical beliefs of the global economics profession. This book has forged to a strong extent the emergence of a main stream in this discipline, and hence *the* mainstream. The book of 700 pages is a book for beginners, at the level of principles, therefore not comparable with KOM or B&J, and even more elementary than M&T. The outstanding talent of Samuelson, to a lesser extent of Nordhaus, is, firstly, to reduce complex problems to what is conceived as their roots, secondly, to merge and synthesise different strands in economics, but mostly more tilted to the (neo)classical side, and, thirdly, to write much easier comprehensible than anybody else (not least by limiting math to a level below the necessary minimum).

The authors, henceforth S&N, devote only 20 pages to exchange rates and the International Financial System, of which only 10 pages are directly on exchange rates. This somewhat stepmotherly dealing with exchange rates could be interpreted as if S&N assign little weight to the subject matter. Indeed they simplify strongly and are quiet on any controversial issues.

They approach foreign exchange markets as if they were like all other markets, so they draw an upward sloping supply curve for Dollars (SS), and a downward sloping demand curve (DD). The supply of dollars comes from US people who need foreign currency to purchase foreign goods and financial assets, and conversely for the demand for dollars from foreigners. The intersection of the curves shows equilibrium, no matter whether short-term or long-term. Then they turn to shifts of demand and supply. They highlight recessions which reduce imports and related demand for forex, followed by an appreciation of the local currency, and they

point to tightening monetary policy with higher interest rates, which appreciates the currency. They refrain from mentioning interest rate parity, since this would imply that the interest rate differential heralds expected later depreciation or appreciation. Foreign exchange markets with flexible exchange rate have “equilibrating power” for the balance of payments, since the current and the financial account are automatically rebalanced once one of the two accounts moves into imbalance (p. 552). Note that a balance in the current account is not addressed here. And what is called “equilibrium” is an accounting identity. Then they summarise for what the other textbook authors need so many chapters:

“In the short-run, market determined exchange rates are highly volatile in response to monetary policy, political events, and changes in expectations. But over the longer run, exchange rates are determined primarily by the relative prices of goods in different countries. An important implication is the purchasing power parity theory of exchange rates.” (p. 552)

They add the usual caveats regarding PPP. They admit that financial flows can overwhelm the mechanism for PPP for many years, yet PPP is considered a useful long-term guide. Here they stop. Empirical evidence is not provided. Different and competing theories are excluded so that students learn the impression that the basics shown are uncontested in the economics discipline. Not a single word is mentioned about possible consequences of exchange rate volatility and misalignments.

In the next section the authors turn to fixed and flexible exchange rate regimes with the historical trends toward the latter. They are cautious on judging that the flexible regime is superior, but they hint to the advantage that “the perils of speculation” undermining fixed rate systems are overcome and that sovereign monetary policy can be conducted under flexible regimes. Implicitly, they seem to contend that speculation (of the stabilizing type) occurs only with fixed rate regimes, but no speculation at all under flexible regimes. They also imply that the Mundell-Fleming model holds (implicating that countries committed to floating can cope with heavy volatility of non-fundamental exchange rates, volatile capital in- and outflows etc.).

These are basic tenets of what can be called mainstream macroeconomics. Reasoning and empirical evidence is sparsely provided here, and the obvious, seemingly legitimate excuse is that this can hardly be done in a book for beginners. Eventually doctrines are forged, taught and learnt almost everywhere on the globe.

## Bottom lines

All four textbooks, offsprings of different strands within US mainstream economics, argue surprisingly differently. In particular, this applies to the judgement on both IRP and PPP theories. All textbooks draw on a narrow sample of theories, most pronounced M&T. Important other theories which question IRP, PPP and flexible exchange rates are excluded, apart from the historical comparisons of fixed and flexible regimes. Despite a view on economic history of exchange rates in all four books, the specificities of modern forex markets and the making of exchange rates are missed. The excessive volatility of nominal and real exchange rates, chronic misalignments, long phases of deviation from PPP, also deviations from uncovered IRP are not satisfactorily explained. Generally, deviations from fundamentals, aligned to the functioning of the real economy, are not well understood. The models used have strong theoretical shortcomings, mostly rooted in the limited understanding of uncertainty and formation of expectations. Equally important is the very limited perception of empirical research, both on the macroeconomic analyses of exchange rates of the microeconomic structure of forex markets, including the behavior of actors. Of course, one must not expect that textbooks can be at the frontier of research, but that empirical research bounces off to preserve old models is a stunning phenomenon, especially in a textbook like the one from KOM which devotes so many chapters to the subject matter. This critique weighs heavily as the empirical evidence exists since more than three decades (since Meese/Rogoff 1983). The discontent is not about empirical details, but about compliance with stylized facts of reality.

The authors reviewed here and their textbooks look like a global oligopoly – with limited competition amongst them – which immunizes itself against outsiders in order to maintain or expand their dominant position on the global textbook market.

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