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Exogenous interest rate and interest rate parity theorems: the post-Keynesian debate and a proposed alternative

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Exogenous interest rate and interest rate parity theorems: the post-Keynesian debate and a proposed alternative[1]

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Abstract

This chapter revisits the post-Keynesian debate on the covered and uncovered interest rate parity (CIP and UIP) conditions. It focuses on the interpretations offered by Lavoie (2000, 2022) and Kaltenbrunner (2020). The chapter then proposes an alternative analytical framework based on the model developed by Serrano, Summa, and Aidar (2021) based on exogenous rates of interest and endogenous expectations. This approach can explain the empirical regularities associated with the failure of UIP, such as the observed carry trade phenomena during stable periods and the reversal of this pattern during episodes of financial distress. Thus, the chapter's contribution is to show that this framework can accommodate key insights from the post-Keynesian critiques while providing a unified analytical perspective on interest rate parity conditions.

Keywords: interest rate, exchange rate, monetary policy, capital mobility, Keynesian economics

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1 Introduction

From a neoclassical perspective, the interest rate parity theorems lead to the conclusion that there is no room for domestic monetary authorities to permanently set the real interest rate differently from the real international interest rate. This result comes from the joint assumption of the validity of the covered interest rate parity, the uncovered interest rate parity and the purchasing power parity (or at least, that agents expect it to be valid). In contrast, post-Keynesians reject the idea that there is a sort of "*natural*" rate for the exchange rate, as the nominal exchange rate is a 'conventional' variable (Harvey, 1991, 2009, 2019, Vernengo, 2001, Lavoie, 2000, Kaltenbrunner, 2020). They also acknowledge the empirical failure of the uncovered interest parity theorem and agree that something else should be put in place (Lavoie, 2000, Kaltenbrunner, 2020, Harvey, 2024).

Nevertheless, divergences remain regarding the theoretical interpretation of both the covered and uncovered theorems from the post-Keynesian perspective (Kaltenbrunner, 2020). On one hand, Lavoie (2000, 2020) develops a framework centered on the behavior of banks in forward exchange markets[2], arguing that Central Banks maintain the capacity to set exogenous interest rates even in open economies. On the other hand, Kaltenbrunner (2020) advances a portfolio approach grounded in the principle of liquidity preference in international financial markets, suggesting that financial openness significantly constrains the degree of Central Banks' control over the domestic interest rate. The latter makes the interest rate differentials endogenous. Despite these differences, both follow as Harvey (2024) the idea that due to uncertainty, the expected exchange rate is seen as exogenous.

In this chapter, we aim to organize the post-Keynesian debate on interest rate parity theorems and propose a way to reconcile it with an alternative analytical framework using the analytical scheme developed by Serrano, Summa, and Aidar (2021) based on

[2]Forward contracts are over-the-counter transactions, mainly carried out by banks, in which a rate is negotiated today for future delivery. This operation guarantees a known exchange rate for a future purchase or sale. These contracts can also be settled by differences, that is, without the actual delivery of the currency. In this case, they are called non-deliverable forwards (NDF). Since the analysis it in terms of NDF does not alter the result, we will base our explanation on the deliverable contract.

exogenous rates of interest and endogenous expectations. Drawing on the latter scheme, which addresses nominal exchange rate dynamics but touches only briefly on interest parity, we extend their approach to engage more explicitly with both the covered and uncovered parity conditions. We argue that this framework can accommodate key insights from the post-Keynesian literature and help reconcile their main empirical implications within a unified analytical perspective.

Following this brief introduction, the chapter is organized into four sections. Section 2 critically assesses the covered interest parity theorem. Section 3 turns to the uncovered parity condition. Section 4 explores how the empirical implications of both post-Keynesian views can be integrated within the proposed framework, and Section 5 concludes.

2 The covered interest rate parity

In a nutshell, the covered interest parity (CIP) states that the difference between the spot exchange rate and the forward exchange rate, which is the exchange agreed for future delivery, should match the differential between the domestic and foreign interest rates, the latter including possible sovereign risk spreads (respectively i, i^* and ρ), as shown in Equation 1[3].

$$(1)\ \frac{f_t}{s_t} = \frac{(1+i)}{(1+i^*)(1+\rho)}$$

Post-Keynesians generally accept the validity of this relation, which is supported by empirical evidence (Taylor, 1987) and has even been described as "the closest thing to a

[3] We included a spread separately from the foreign interest rate to call attention that financial institutions may face costs to borrow funds in foreign currency in addition to the interest rate prevailing in the money market. According to Lavoie (2021, p. 23) "banks charge the interest rate differential in relation to the cost that they encounter". Cieplinski et al (2018) found that the sovereign spread as measured by the country risk EMBI-br is a good proxy to be included in addition to the libor interest rate which improve the validity of the covered interest parity for the Brazilian Real and the US$ dollar.

physical law in international finance" (Borio et. al., 2016, p.45)[4]. Lavoie (2000) calls the post-Keynesian view on covered parity 'cambist' or 'the cambist view'. In this section, we will critically assess the mechanism that guarantees the covered interest rate parity proposed by Lavoie (2000) and the implications of such parity.

2.1 The debate between post-Keynesians on the interpretation of the covered interest rate parity

The main post-Keynesian interpretation of the CIP is known as the *cambist view*, initially proposed by Coulbois and Prissert (1974, 1976) and later reinterpreted by Lavoie (2000, 2003, 2021, 2022). This explanation centers on the role of wholesale banks operating in forward exchange markets and assumes that banks do not take uncovered positions. When a client engages in a forward exchange transaction, the bank immediately hedges its exposure through a spot operation in the opposite direction. For instance, if a customer agrees to buy foreign currency forward, the bank will borrow domestic currency, convert it into foreign currency at the spot rate, invest it at the prevailing foreign interest rate, and commit to delivering the foreign currency to the client on the agreed future date.[5]

The forward rate is thus determined by the cost to the bank of carrying out this hedged operation. Specifically, the cost is the interest paid on domestic borrowing minus the interest earned on the foreign investment, adjusted by the spot exchange rate. The

[4] Einzig (1937), as pointed by Spraos (1953, p.91), was the first to use the term 'interest parity' to indicate the relation between interest rate differentials and the forward and spot rates. See Cieplinski (2014, chapter 1) for the history of economic thought on the covered and uncovered interest rate parity theorems.

[5] As Keynes (1923) noted, banks do not need to hedge every individual forward transaction separately but can instead cover only the net surplus or deficit of forward orders. This point was later developed by Kindleberger (1939) and Einzig (1960) further noted that this practice became widespread during the 1950s, with banks increasingly "marrying" buying and selling orders of forward exchange to minimize their exposure (p. 486). According to the cambist view, once the bank converts the invested amount into dollars and commits to delivering the agreed sum to its client, the spot exchange rate at the time of delivery becomes irrelevant for the bank. Since the bank is not speculating on exchange rate movements, it only needs to set the forward rate at a level sufficient to cover the cost of domestic borrowing minus the return on foreign investment, thereby avoiding any losses.

resulting interest differential determines the forward premium or discount, with banks typically charging a small margin over this cost[6]. Lavoie integrates this operational account with the post-Keynesian horizontalist perspective, which holds that Central Banks exogenously set interest rates. From this standpoint, the forward exchange rate reflects the difference between exogenously determined interest rates, as shown in Equation (2):

$$(2)\ \frac{(\overline{1+\imath})}{(\overline{1+\imath^{*}})(1+\rho)_{t}} \underset{=}{\rightarrow} \frac{f_t}{s_t}$$

As a consequence of this cambist interpretation of functioning of the forward exchange market, Lavoie (2000, p. 171) concludes that CIP "always holds perfectly, by definition," with the forward exchange rate representing a "mark-up" (equal to the interest rate differential) over the spot rate (Lavoie, 2003, p. 241).

Our interpretation differs from the cambist view in how it conceptualizes the mechanism underpinning the CIP. Specifically, we understand CIP as a non-arbitrage condition, not as a cost-based price-setting rule. As briefly noted by Serrano, Summa, and Aidar (2021, p. 8), "the forward premium in the FX forward market must equal the interest differential, otherwise investors would obtain non-risky profits out of this difference". This means that the forward premium must equal the interest rate differential, or else arbitrage opportunities would emerge. Since all relevant "prices" (the spot rate, the forward rate, and interest rates) are known at the time the contract is made[7], any persistent deviation from parity would allow riskless profits through strategies such as borrowing in domestic currency, converting at the spot rate, investing in the foreign currency, and selling

[6] As happens in the spot market: exchange dealers buy currency at lower price and sell it at a higher price.

[7] Keynes correctly said that: "*A "forward" contract is for the conclusion of a "spot" transaction in exchange at a later date, fixed on the basis of the spot rate prevailing at the original date*." (Keynes, 1923, p.116). Thus, the forward exchange rate is determined in relation to the spot rate when a contract is signed. In fact, Keynes (1923) and Einzig (1937) believed that, because the forward markets were not perfectly developed, a minimum profit margin of about 0,5% was necessary for agents to engage in interest arbitrage operations. This was later confirmed by Peel & Taylor (2002) for the pre-World War II period. In the fifties this rule became obsolete (Einzig, 1960).

forward[8]. These arbitrage flows, not pricing decisions by banks, are the drivers of the adjustment process that restores parity regardless of expectations[9].

Even if we accept the cambist assumption that banks hedge all their positions[10] and have enough market power[11], this does not explain why they do not set forward rates well above cost. The explanation advanced here is that if they did, arbitrageurs could still exploit the resulting mispricing, undermining any excess markup.

That is, what would happen if wholesale banks decided to set a forward exchange rate much higher than the spot exchange rate corrected by the interest rate differentials? Someone could probably simultaneously borrow in domestic currency at the available domestic interest rate, buy dollar spot, invest in the foreign interest rate, and sell dollar forward, making profits with no risk. Of course, this possibility would be explored up to the point that there is no more possibility of making profits with risk-free operations. And this would occur because these movements of exploring arbitrage would adjust the forward premium.

Therefore, we conclude that it is not the banks' cost structure but the disciplining force of (actual or potential) arbitrage that constrains forward rate setting and guarantees that the covered parity will hold[12]. Thus, it is a market mechanism that guarantees the

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[8] A similar explanation based on arbitrage condition is also put forward by Borio et. al (2016).

[9] The view that the forward exchange rate reflects speculators' expectations about the future spot rate was initially proposed by Keynes (1923) that did not clearly distinguish between the covered and uncovered interest parity conditions. Later, Tsiang (1958), explicitly derived the uncovered interest parity condition. In mainstream models, which often combine CIP and UIP, without properly differentiating their mechanisms, the forward rate and the expected spot rate are equal by definition. However, combining UIP and CIP this can be problematic, as will be discussed later: while CIP is a no-arbitrage condition based on known prices at the time of the transaction, UIP involves expectations about an uncertain future value.

[10] Kaltenbrunner (2020, p12) correctly question why banks always hedge themselves and do not speculate.

[11] Lavoie (2021) justifies the control over the forward rates by wholesale banks due to the overwhelmingly larger number of operations that are made by banks in these markets: "*for one operation due to a customer, there may be 20 operations involving only banks*" (Coulbois 1972, p. 38).

[12] In the post-Keynesian literature, our view also seems to be shared with Harvey (2025, p.19, fn16) who explain the cambist view on the covered parity with a prominent role by banks setting the forward premium but under 'competition in the market for the contracts'.

achievement of the covered parity, even though the exchange market can be composed of large wholesale banks.

The upshot of this view on how these markets behave under competition leads to a somewhat different conclusion than the cambist view, according to which the covered parity "*always holds perfectly, by definition*" (Lavoie, 2000, p. 172). In our alternative interpretation, the covered parity **generally** holds because it is difficult to have different prices for the same thing for a long period. However, deviations are possible, particularly during periods of financial stress. In such cases, shortages in short-term credit in foreign currency may prevent arbitrage from operating effectively, allowing temporary violations of CIP[13].

2.2 Implications of the different interpretations of CIP

Although we differ in how we explain the mechanism through which CIP is enforced, whether via banks' pricing behavior or through competitive arbitrage, our interpretation of covered interest parity (CIP) shares several key conclusions with the version of this view revisited by Lavoie (2000, 2003, 2021, 2022). Additionally, both perspectives yield similar theoretical implications.

First, we share the horizontalist post-Keynesian position that interest rates are exogenously determined by Central Banks, even in open economies. Second, we agree that the forward exchange rate is not determined by expectations of the future spot rate, and thus is not necessarily equal to it.

[13]Note that for Lavoie (2002) deviations from the covered parity can happen with capital controls as "*the forward rate paid by a national resident might be different from that paid by a foreign customer, because foreign banks will only have access to euromarkets, which, because of capital controls, will be partly disconnected from the domestic money markets. As a result, in particular when a currency is under attack, money market rates on the euromarkets might rise above those of the domestic money market, thus leading to two distinct forward rates. It is this feature of capital controls that, I believe, has led some to deny that covered interest parity holds at all times.*" (Lavoie, 2002 p. 238).

Third, we agree that the adjustment mechanism runs from the interest rate differential to the forward premium, as expressed in Equation (2), rather than the other way around.

Thus, while we contest the cambist explanation of how the market ensures parity, we agree with Lavoie (2000, 2019) on the main implications of the revisited cambist framework. Ultimately, whether CIP is upheld due to banks' pricing behavior or through arbitrage in competitive markets is secondary to the broader point: the forward rate is not a reflection of expected future spot rates. As Moosa (2017, p. 6) notes:

> "How is this forward exchange rate calculated? It cannot depend on the [spot] exchange rate 1 year from now because that is not known. What is known is the spot price, or the exchange rate, today, but a forward price cannot simply equal the spot price, because money can be safely invested to earn interest, and, thus, the future value of money is greater than its present value. What seems reasonable is that if the current exchange rate of a quoted currency with respect to a base currency equalizes the present value of the currencies, then the forward exchange rate should equalize the future value of the quoted currency and the future value of the base currency."

We therefore agree with Coulbois and Prissert (1974, p. 283) on the importance of distinguishing between covered and uncovered exchange transactions. These should be treated as conceptually distinct, both in terms of theory and empirical application. Yet, we agree with Smithin's (2002) and Kaltenbrunner's (2020) insight that *"[w]hat the Cambist view determines is not the spot rate or forward rate individually, but the forward premium [the difference between the forward and the spot exchange rate]* (Kaltenbrunner, 2020, p.13).

In other words, the existence of a forward contract does not, in itself, alter the determination of the spot exchange rate[14]. The fact that foreign currency can be promptly delivered or delivered at a future date must not bring any new information about the level

[14] Kindleberger (1939, p. 179) pointed this out decades ago when he noted that, "the forward contract in foreign exchange introduces no real change into foreign exchange theory."

of the spot exchange rate[15] and, consequently, the determination of exchange rate dynamics must be found outside the forward market mechanisms (see Serrano, Summa and Aidar, 2021; Barbosa-Filho, 2022, p.106).

Nevertheless, the existence of forward markets may influence the functioning of exchange markets more broadly. As Kindleberger (1939, p. 179) observed, although speculation occurs in both the forward and spot markets, the possibility of forward delivery (and the development of financial instruments that replicate it) enhances liquidity by allowing transactions to be settled at a future date rather than immediately, often requiring only a small collateral upfront. The real contribution of the forward market thus lies "*in providing inexpensive opportunities for hedging and speculation*" (Kindleberger, 1939, p. 181).

3 The uncovered interest rate parity

Having established that the forward premium cannot determine the nominal spot exchange rate, we now turn to the uncovered interest parity (UIP) condition, which introduces an explicit role for expectations in the relationship between interest rate differentials and exchange rate dynamics. Unlike CIP, which is purely a no-arbitrage condition based on known prices at the time of the transaction, UIP links interest rates to the expected future evolution of the spot exchange rate. Thus, it plays a central role in mainstream theories of exchange rate determination.

The uncovered interest parity condition states that the differential between domestic and foreign interest rates, the latter added by a risk spread, should be equal to the expected

[15] As noted by Smithin (2002 p. 225): "In order to infer the value of the forward rate, there must also be some explanation of the level of the current spot rate, which in turn must entail some explanation as to why, at any point in time, speculators and other participants in the foreign exchange markets are willing to hold the portfolios they currently do".

rate of change in the nominal exchange rate, that is, the difference between the expected future spot rate (s^e_{t+1}) and the current spot exchange rate (s_t) , as in Equation 3:

(3) $\frac{s^e_{t+1}}{s_t} = \frac{(1+i)}{(1+i^*)(1+\rho)}$

In the standard neoclassical textbook view, the UIP condition operates as follows. Given that the Central Bank exogenously sets the domestic nominal interest rate and that the expected future spot exchange rate is taken as given, Equation (3) implies that the current spot exchange rate adjusts to maintain equilibrium (Blanchard, 2017, chap. 19). Starting from an initial equilibrium, an increase (decrease) in the interest rate differential leads to an immediate appreciation (depreciation) of the spot exchange rate. Since the expected future spot rate is assumed to remain unchanged, the new level of the current spot rate generates an expected future depreciation (appreciation) that matches the new interest differential, preserving uncovered interest parity.

In this mainstream framework, the expected future exchange rate is treated as exogenous because it is assumed to be anchored by (rational) expectations regarding the validity of the Purchasing Power Parity (PPP). Notice that the UIP together with expectations on the PPP implies the validity of the real interest rate parity, i.e., that domestic and foreign real interest rates must be equal.

Furthermore, the theoretical validity of UIP depends on an additional assumption. International capital markets are assumed to be perfect in the sense that there is unlimited access to capital at an interest rate slightly above the international rate of reference (including the risk spread). As Gandolfo (2016, p. 60) notes, the UIP condition relies on the notion of an infinitely elastic response of short-term capital flows to interest rate differentials.

While the mainstream interpretation of uncovered interest parity (UIP) provides a simple mechanism linking interest rate differentials to exchange rate expectations, it relies on strong assumptions—perfect capital mobility, rational expectations, and the exogeneity of expected level of the spot exchange rate. These assumptions have been subject to criticism from post-Keynesian economists, who question both the empirical validity and theoretical foundations of UIP. In what follows, we present the post-Keynesian critique of uncovered interest parity, focusing on the contributions of Lavoie and Kaltenbrunner, and discuss the alternative interpretations they propose.

3.1 The post-Keynesians interpretations of the uncovered interest rate parity

3.1.1 Lavoie and the criticism of mainstream UIP

As we have seen, Lavoie (2000, 2022) provided a proper post-Keynesian explanation for the CIP. However, he did not develop an articulated alternative to replace the UIP condition. His main contribution lies in offering a critical assessment of both the empirical evidence and the theoretical literature of the UIP.

On the empirical side, Lavoie (2000) highlights the poor performance of UIP in econometric tests. A major issue is that estimates of UIP, when statistically significant (which is not always the case), tend to display the opposite sign to what the theory predicts (Sarno, 2005, Chinn and Frankel, 2020). That is, while UIP suggests that a positive interest rate differential should correspond to an ‘once and for all” appreciation of the spot exchange rate, which should be followed by an expected, and (assuming expectations are confirmed) actual depreciation. However, empirical results typically show that higher interest rate differentials are associated with **a process** of exchange rate appreciations rather than depreciations (Lavoie, 2000, p. 173).

On the theoretical side, Lavoie notes that imperfect substitutability between financial assets across countries hinders the assumption of infinitely elastic capital flows in response to interest rate differentials (Lavoie, 2003). Additionally, he discusses the role of current account transactions in exchange rate determination, an element missing from the UIP framework (Godley and Lavoie, 2007, ch. 12). Moreover, he emphasizes that exchange rate expectations are shaped by social conventions, following Harvey’s (1991) interpretation of Keynesian uncertainty. Together, these critiques explain why UIP fails empirically. They also support Lavoie’s conclusion that Central Banks can exogenously set domestic interest rates independently of the international rate (Lavoie, 2000, p. 176). However, despite his critical assessment, Lavoie (2000, 2022) does not propose a fully developed alternative framework to replace UIP from a post-Keynesian standpoint. In this sense, Lavoie does not propose a closed positive explanation for the nominal exchange rate dynamics.

3.1.2 Kaltenbrunner and endogenous interest differential

An alternative complete post-Keynesian interpretation of the uncovered interest parity was proposed by Kaltenbrunner (2020)[16]. Her approach draws on Keynes' (1936) Chapter 17 of The General Theory and its suggested extension to an open economy by Kregel (1982)[17], incorporating assets denominated in different currencies into a liquidity preference-based portfolio analysis[18].

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[16] Note, however, that Kaltenbrunner (2000, p20) place the structuralist contribution that is based on Kregel (1982) and developed by her as explaining the covered parity. In her words, "*in this view of Keynes' covered interest parity, the forward rate is again a reflection of exchange rate expectations*." (Kaltenbrunner, 2020, p.14). But as this interpretation considers the forward exchange rate equal, and in fact only a reflection of the expected spot exchange rate, $f_t \underset{=}{\leftarrow} s^e_{t+1}$, this implies that the uncovered interest parity theorem is the relevant one. We thus place this contribution as explaining the uncovered parity. In fact, Kregel (1982) refers to the "interest parity theorem", in singular, both when he talks about the difference between the forward to spot exchange rate (p.168) and to expected exchange rate change (appreciation or depreciation) (p.170, 172).

[17] It was Tsiang (1958) who made the pioneer presentation of the UIP, the origin of the latter can be traced as far back as chapter 17 of Keynes' General Theory and its extension on speculation by Kaldor (1939), by including foreign exchange into this scheme.

[18] Kregel interprets Keynes' writings on the forward exchange market as an early development of his 'own rate of return' and 'liquidity preference' theories. In fact, in chapter seventeen of the General Theory, Keynes (1936) starts exposing his portfolio analysis using the spot and forward prices of assets in general. Then, he substitutes the forward price by the expected price of the asset. This means that the forward price and the expected price are used interchangeably. Kregel (1982) extended this portfolio analysis for assets denominated in different currencies and applies it to the exchange rate market in terms of forward and spot exchange rate (Kregel, 1982, p.168). Then, he shifts to the idea of arbitrage in terms of expected appreciation (depreciation) of the exchange rate (p.172). See Grieve (2015) for problems of exposition in Keynes' chapter 17 of the General Theory related with the use of the concepts of own rates of interest and the marginal efficiency of the capital.

In Kaltenbrunner's framework, a relationship between interest rate differentials and expected changes in exchange rates still holds, broadly along the lines of Equation (3). However, a key addition is the introduction of a different liquidity premium between the two currencies. The premium reflects monetary asymmetries in the international monetary system, since each currency has a different ability to perform internationally the functions of medium of exchange, unit of account, and store of value (Andrade and Prates, 2013, p. 409; Kaltenbrunner, 2020, p. 18). In other words, exchange rate dynamics must account for the existence of a currency hierarchy, where the international currency (i.e. the dollar) has the highest liquidity premium. Equation (4) captures this modification, which, according to Hein (2023, p. 210), can be seen as a variant of the uncovered parity theorem:

$$(4)\ \frac{(1+i)(1+\theta)}{(1+i^{*})} = \frac{s_{t+1}^{e}}{s_t}$$

In Equation 4, i^{*} denotes the international interest rate paid by assets denominated in the international currency (i.e. the dollar), i is the domestic interest rate paid by assets denominated in another currency in a lower position in the international monetary hierarchy and θ, denotes the liquidity premium of the domestic currency relative to the dollar. The higher is the position of a currency in the international hierarchy, the larger will be its liquidity premium, and for a given the ratio between the expected and the spot exchange rate ($\frac{s_{t+1}^{e}}{s_t}$), the lower the domestic interest rate that can be sustained.

Notice that here the premium is expressed in terms of what investors ask to demand some currency in a portfolio model, and not in terms of borrowing costs as expressed in spreads. So, in the end the liquidity premium can be seen as just the inverse of the risk spread, as expressed in Equations (3) and (4).

As a result of this view, when the expected exchange rate change, the liquidity premium and the international interest rate are given, the *long-term* equilibrium interest rate paid on domestic currency is determined endogenously (Hein, 2023, p. 210). That is, "*the causality runs from the differential of the expected and the current exchange rate to the required interest rate differential*" (Hein, 2023, p. 210).

Thus, according to this view "*expectations (...) are largely reflected in the interest rate differential between the two countries under consideration, rather than the spot rate itself*" (Kaltenbrunner, 2020, p.14). In other words, expectations about future monetary conditions or exchange rates are largely reflected in the interest rate differential rather than in the spot rate itself, and, thus, portfolio decisions by the private sector transmit exchange rate expectations into interest rate differentials (Kaltenbrunner, 2020, pp. 14–15). Equation (5) denotes the causality implied in this view (from the expected change in the exchange rate to the required interest rate differential):

$$(5)\ \frac{(1+i)(1+\theta)}{(1+i^*)} \underset{=}{\leftarrow} \frac{s^e_{t+1}}{s_t}$$

In this approach, the domestic nominal interest rate cannot be freely exogenous in an open economy. This would also impliy the impossibility of the Central Bank in peripheral countries to exogenously set the real interest rate, even without the assumption of the PPP.

According to Kaltenbrunner (2020, p. 15), following Keynes' liquidity preference theory applied to an open economy, only the Central Bank issuing the currency with the highest liquidity premium (the dollar) can fully accommodate a rising demand for money. Other Central Banks are constrained by their foreign reserve holdings:

> "This argument [that Central Bank's rate can be considered exogenous], however, hinges fundamentally on the assumption that the central bank can accommodate any rising demand for money (…) which might not hold in the international context. Indeed, (…) in the international context and applying Keynes' liquidity preference theory to the open economy, only one central bank, the issuer of the currency with the highest liquidity premium, can totally accommodate a rising demand for money. All other central banks will be constrained by their "money holdings", i.e. their foreign exchange reserves" (Kaltenbrunner, 2020 p.15).

Notice that this view by Kaltenbrunner would imply that there is symmetry regarding situations in which a country is losing or accumulating foreign exchange reserves for the capacity of setting domestic interest rates. But in fact a peripheral Central Bank can always set domestic interest rate higher than the international rate and accumulate foreign reserves, and the problem of the constraint on foreign reserves will not appear (Serrano and Summa, 2015).

3.1.3 Harvey and exogenous interest rate differentials

Of course, the Central Bank cannot accommodate any demand for foreign reserves since they are limited, but the resulting constraint primarily affects the exchange rate rather than the domestic interest rate (Harvey, 2025). Harvey (2025) thus proposes a quite different closure for the same Equation (4). Contrary to Kaltenbrunner (2020), Harvey maintains the interest rate as exogenously set by the Central Bank, as they can always accommodate the demand for reserves denominated in their own currency, given their monopoly over its issuance[19]. Under Harvey's view, the modified UIP with exogenous interest rate implies a causality running from interest rate differentials to expected change in the exchange rate

$$(6)\ \frac{(1+i)(1+\theta)}{(1+i^*)} \overset{\rightarrow}{=} \frac{s_{t+1}^e}{s_t}$$

In this case, an increase in the domestic interest rate would cause an appreciation of the spot exchange rate, which, given the expected future rate, implies expectations of exchange rate depreciation[20]. This result, however, is the same as the usual obtained by the UIP, as discussed by Blanchard (2017). Harvey (2025b) acknowledges this resemblance, noting that the portfolio-based approach incorporating liquidity premia and exogenous expectations "*bears some similarity to Neoclassical theories of international capital flows like uncovered interest rate parity*" (Harvey, 2025b, p. 12).

[19] He mentions Lavoie (2000: 170-1) as a reference for the fact that "in the real world they are policy targets, exogenously determined by Centralbank policy". For the same point but for a more mainstream perspective, see also Borio and Disyatat (2010).

[20] This same result appears in Kaltenbrunner (2015, p.433, 2020 p. 16).

If we assume that expectations on average are right ($s^e_{t+1} = s_{t+1}$), this view produces the result that positive interest rate differentials must be associated with a depreciation of the exchange rate in t+1, a result that is difficult to verify empirically and which was criticized by Lavoie (2000). Harvey (2025) does not follow this route and explains deviations from uncovered parity through shifts in exogenous exchange rate expectations.

In Harvey's framework, deviations from UIP are explained not through market imperfections but through shifts in exchange rate expectations driven by changes in forecast confidence. As Harvey (2025) puts it, deviations occur because "*the reason for the continued existence of deviations from uncovered interest rate parity (...) was related to a factor thus far ignored: forecast confidence.*" Under uncertainty and nonergodicity, as Harvey (1991, 2009, 2019) emphasizes, expectations are shaped by social conventions, and sudden shifts in confidence lead to deviations from the UIP condition.

3.2 Replacing the Uncovered Interest Parity

While post-Keynesian critiques have exposed the limitations of UIP, few efforts have proposed a clear alternative framework for analyzing nominal exchange rate dynamics. In response to this gap, Serrano, Summa, and Aidar (2021) develop a new approach based on the balance of payments. Their framework offers a straightforward mechanism incorporating key post-Keynesian insights. First, as in Harvey and Lavoie, that interest differential is exogenous. Second, the criticism of Lavoie (2003) that interest rate differentials do not induce infinite capital flows (Serrano and Summa, 2015). Third, that the nominal exchange rate behavior depends also on other external sector flows (such as trade balances and long-term financial flows) as in Godley and Lavoie (2007, Ch. 12), instead of relying solely on short-term portfolio decisions in financial markets. This means that the BP curve is not horizontal. But our framework makes a crucial distinction from previous post-Keynesian views by treating exchange rate expectations as endogenous rather than exogenous.

Formally, the dynamics of the nominal exchange rate in Serrano, Summa, and Aidar (2021) are derived from the balance of payments identity, incorporating both trade flows and short- and long-run financial flows. The structure of the model is presented in Equations (7) and (8) below.

The BP (Equation 7) is composed of trade flows (CA) and financial flows, the latter divided into short-run (F_{SR}) and long-run (F_{LR}) financial flows. Trade flows and long-run financial flows are considered exogenous.

(7) $BP = CA + F_{SR} + F_{LR} = 0$

In contrast, as shown in Equation (8), short-run financial flows depend on interest rate differentials, which include expectations about future exchange rate changes and the country's sovereign spread (ρ_t). The sovereign spread generally reflects both international credit conditions and the market's perception of a country's risk of default on foreign currency liabilities. Here, it is treated as an exogenous variable. Its role is conceptually similar to the liquidity premium introduced by Kaltenbrunner (2020), representing the extra cost residents pay to borrow in domestic currency relative to the international interest rate[21]. Since interest rate differentials (including sovereign spreads and exchange rate expectations) only lead to finite short-run capital flows, the model introduces a parameter γ that measures the sensitivity of short-run financial flows to the risk-adjusted interest rate differential.

(8) $F_{SR} = \gamma \left[\frac{(1+i)}{(1+i^*)(1+\rho)\left(\frac{s^e_{t+1}}{s_t}\right)} - 1 \right]$

By substituting (8) into (7) and denoting the sum of exogenous trade and long-run financial flows as TF, we have Equation (9).

[21] Here again it is expressed in terms of borrowing costs includes as a spread, instead of liquidity premium.

$$(9)\ \frac{s_{t+1}^{e}}{s_t} = \frac{(1+i)}{(1+i^{*})(1+\rho)} \frac{1}{\left(1-\left(\frac{TF}{\gamma}\right)\right)}$$

Equation (9) mirrors the structure of the standard UIP Equation but incorporates the influence of exogenous trade and long-run financial flows, thus embedding the assumption of imperfect international capital markets and finite capital flows.

The main difference between the Serrano, Summa, and Aidar (2021) approach and previous post-Keynesian contributions lies in the modeling of exchange rate expectations. While Lavoie (2000, 2022), Kaltenbrunner (2020), and Harvey (2025) acknowledge that expectations are shaped by social conventions (following Harvey, 1991), they treat expectations as exogenous and independent from spot exchange rate behavior.

By contrast, Serrano, Summa, and Aidar (2021) follow insights from Frenkel and Taylor's (2006, p. 7) 'speculative' view, according to which a decrease in the domestic interest rate leads to a **process** of exchange rate depreciation. They also draw inspiration from Lavoie and Daigle (2011), who model expectations with a combination of 'conventionalist' agents, whose expectations are inelastic, and 'chartist' agents, who adjust expectations based on the recent past.

In Serrano, Summa and Aidar (2021)'s model, exchange rate expectations are always to some extent elastic in the sense of Hicks (1946), i.e., they are corrected over time by experience, based on observed behavior of the spot exchange rate. This idea is then formalized through adaptive expectations, where the solution leads to: $s_{t+1}^{e} = s_{t-1}$ [22]. Substituting this into Equation (9) and rearranging gives:

$$(10)\ \frac{s_t}{s_{t-1}} = \frac{\left(1-\left(\frac{TF}{\gamma}\right)\right)}{\frac{(1+i)}{(1+i^{*})(1+\rho)}}$$

[22] See Serrano, Summa and Aidar (2021, p. 10-11,14) for the discussion on the adaptive expectations and the convergence of expected exchange rate to past exchange rate.

Equation (10) shows that the dynamics of the nominal exchange rate depend on the exogenous domestic and international interest rates, the sovereign spread, and the sum of trade and long-run financial flows. In a longer run, the rate of change of the exchange rate becomes inversely related to the interest rate differential and the net current account balance plus long-term financial inflows.

In this model, agents are neither exclusively 'conventionalists' nor purely 'chartists.' When they perceive that past exchange rate no longer offers a reliable guide to the future, they adjust the expected level of the exchange rate exogenously. However, they also will not keep holding those initial expectations unchanged over time if they perceive that they do not correspond to what happened in reality. As a result, even after exogenous shocks, the exchange rate tends to return to the path dictated by Equation (10).

Importantly, this framework explains why empirical estimates often find that exchange rates appreciate (depreciate) when interest rate differentials are higher (lower), a pattern seen as a 'puzzle' from the perspective of standard UIP theory. In this model, the so-called UIP failure is not a puzzle but a natural consequence of exchange rate expectations being corrected based on past outcomes. Another feature of the puzzle is that the estimated constant term is not statistically different from zero, and this can be explained fact "that with free but imperfect capital markets the interest rate differential is not the only determinant of changes in the exchange rate", so trade and long-term financial flows are also relevant to exchange rate dynamics (Serrano et al, 2021, p.26).

Another result of this simple model is the potential instability of floating exchange rates. That is, this regime can lead to **processes** of currency appreciation or depreciation, depending on the variables present in Equation (10).[23]

Finally, and recalling the discussion in section 2 on covered parity, we should notice that the expected spot exchange rate influences (but not completely determines) both the spot

[23] This idea is in line with the pattern observed by Schulmeister (1988), that is, "the pattern of the daily exchange rate movements is examined to show that a sequence of upward and downward trends interrupted by non-directional movements is typical of exchange rate dynamics in the short run".

and the forward exchange rate, the latter two necessarily linked by arbitrage (Serrano et al, 2021, p.9).

Having presented the alternative framework for nominal exchange rate dynamics, we now turn to its main empirical and policy implications. In particular, we aim to show how the approach developed by Serrano, Summa, and Aidar (2021) can accommodate the different empirical patterns observed in exchange rate behavior and the central role played by monetary policy in managing exchange rate instability under imperfect asset substitutability and capital mobility.

4 Implications of the alternative to the UIP

Based on our critical assessment of post-Keynesian views of interest rate parity theorems, we argue that the simple scheme for nominal exchange rate dynamics proposed by Serrano, Summa, and Aidar (2021) can encompass the main empirical observations and policy motivations behind the main post-Keynesian approaches to the interest rate parity theorems and their relationship with exchange rate dynamics.

The empirical motivation and the observed behavior of exchange rate markets are summarized by Kaltenbrunner (2020):

> "Now, the question remains which interpretation is a better reflection of the working of the foreign exchange market? On the empirical level, both views seem to hold true at different times. At certain times, short-term interest rates (and short-term exchange rate expectations) become the main drivers of exchange rates. This has been the case, for example, in the recent carry trade phenomenon. At other times, expected exchange rate changes might be the main driver of interest rate changes, particularly during financial crises." (Kaltenbrunner, 2020, p. 15)

Kaltenbrunner (2020) suggests that opposing theoretical explanations about the interest rate determination can coexist. That is, sometimes domestic short-term interest rate is exogenous, as in Lavoie (2000). In that case, it is the main driver of exchange rate dynamics. At other times, domestic short-term interest rate becomes endogenous, in line with the explanation advanced by Kregel (1982) and Kaltenbrunner (2020) herself. In that case, expected changes in the exchange rate become the main force determining domestic interest rates. Thus, Kaltenbrunner points to the coexistence of two opposing interpretations of the exchange rate–interest rate relationship to explain a relevant empirical fact.

However, due to the asymmetries mentioned in section 3 above, that the Central Bank can always set the interest rate above the international rate and accumulate reserves, the same empirical pattern can be explained with the exogenous interest rate approach (Cieplinski, Braga, and Summa, 2017). Clarida, Davis, and Pedersen (2009) highlight a direct relationship between the failure of uncovered interest parity (UIP) and carry trade activities. They show that during periods of low exchange rate volatility, UIP tends to fail, with carry trade strategies delivering positive returns associated with negative estimated coefficients in UIP regressions. Conversely, during periods of high exchange rate volatility, carry trade profitability diminishes and estimated UIP coefficients become positive. Similar findings are reported by Cieplinski, Braga, and Summa (2017) in the case of the Brazilian Real and the US Dollar. Their regime-switching estimations suggest that during volatile periods, typically triggered by external shocks, UIP coefficients are positive and often greater than one, while during stable periods, coefficients turn negative, reflecting profitable carry trade opportunities.

The alternative approach proposed in Serrano, Summa, and Aidar (2021) has the advantage of explaining these empirical patterns with a unique theory for the interest rate determination. Central banks set exogenously interest rates according to domestic policy objectives, but they may be forced to react in periods of international financial distress. This occurs because the policy objectives can be incompatible with the previous interest rate, leading to policy reactions by the Central Bank to sudden exchange rate changes. In such cases, exchange rate depreciation pressures may force policy adjustments, not as an automatic market correction as in standard UIP logic but as a discretionary reaction by Central Banks to avoid exchange rate instability. In fact, using Equation (10), it is possible to derive an '*equilibrium interest rate*' that stabilizes the nominal exchange rate. This equilibrium rate depends on the international interest rate, the sovereign spread, and the country's net current account and long-term capital flows.

In periods of external and domestic financial stability, when external accounts are relatively balanced and sovereign spreads are stable, the model predicts that an exogenous increase in the domestic interest rate differential leads to **a process** of appreciation of the domestic currency. This occurs because, under adaptive expectations, investors revise their expectations slowly in response to observed exchange rate behavior, and finite short-run capital flows are sensitive to interest rate differentials. As a result, a higher domestic interest rate attracts short-run capital inflows, reinforcing currency appreciation, consistent with the negative coefficients typically estimated in empirical UIP regressions during stable periods.

In times of international financial crises or market distress, the sovereign spread tends to rise, shifting the equilibrium interest rate upward. While the Central Bank is not mechanically forced to adjust its policy rate, it often chooses to do so to counteract depreciation pressures. Similarly, increases in the international interest rate or declines in the current account and long-run capital flows can also necessitate adjustments to the domestic interest rate to stabilize the exchange rate. In these situations, expected exchange rate changes driven by new information become the main factor influencing the equilibrium interest rate. Consequently, Central Banks adjust their policy stance not as a direct market reaction but as part of their broader objective to manage external stability.

Since free-floating regimes are intrinsically unstable, Central Banks thus seek to limit instability through interventions in foreign exchange markets (Calvo and Reinhart, 2002; Steiner, 2017; Frankel, 2019). These interventions include, for example, spot market operations (Patel and Cavallino, 2019), forward market interventions (Farhi, 2017), and adjustments to the domestic nominal interest rate to influence short-term capital flows. Instead of modifying interest rates, Central Banks sometimes introduce taxes on short-term capital inflows or outflows to affect the effective interest rate differentials. In practice, extreme instability in floating exchange rates is rarely observed precisely because of such active interventions.

Thus, the simple model proposed by Serrano, Summa, and Aidar (2021), with exogenous interest rates, imperfect international capital markets, and adaptive expectations, can accommodate both empirical cases: the ‘carry trade’ pattern during stable periods and the ‘distress’ behavior during volatile periods. Importantly, in the latter case, the adjustment of interest rates is not an automatic outcome of uncovered interest parity, but a policy reaction. While the domestic interest rate remains a policy variable, setting it below the equilibrium rate has consequences: persistent exchange rate depreciation pressures that eventually compel Central Banks to intervene.

5 Final Remarks

In this chapter, we revisited the post-Keynesian debate on the covered and uncovered interest rate parity conditions, focusing on the contributions of Lavoie (2000, 2022) and Kaltenbrunner (2020). We also presented an alternative framework to replace UIP condition, based on the work of Serrano, Summa, and Aidar (2021), which offers a simple mechanism for understanding nominal exchange rate dynamics under imperfect international capital mobility.

On the covered interest parity, while our approach aligns with Lavoie's (2000, 2022) view that domestic interest rates are exogenously set even in open economies, we diverge from his explanation of how the forward premium is determined. Rather than attributing it to the behavior of wholesale banks operating in spot and forward markets, we argue that covered parity is enforced through a broader market mechanism driven by arbitrage. Nonetheless, we reach the same fundamental conclusion: the forward rate should not be interpreted as expectational.

With respect to uncovered interest parity, although we share many of the critiques, our framework presents a more pronounced divergence from the post-Keynesian alternative approach discussed in this chapter. Whereas the structuralist tradition, as developed by Kaltenbrunner (2020), adapts UIP by introducing a liquidity premium differential and emphasizing the role of expectations and the potential endogeneity of domestic interest rates, we propose to use the model developed by Serrano, Summa, and Aidar (2021) as an alternative. This later model shares the remark made by Lavoie (2000, 2022) that interest rates are exogenous and international capital markets are imperfect and incorporates elastic exchange rate expectations into a balance-of-payments framework. By allowing expectations to adjust over time in response to observed spot exchange rate behavior, this model explains the empirical failure of UIP without relying on rational expectations or assuming perfect capital mobility. In particular, it accounts for the observed carry trade phenomena during periods of stability, where higher domestic interest rates are associated with currency appreciation, as well as the reversal of this relationship during episodes of financial distress. We therefore argued that this model can accommodate key insights from the post-Keynesian literature (exogenous interest rate, imperfect capital mobility, and the important role of expectations), reconcile their main empirical implications within a unified analytical perspective and advance the role of monetary policy in exchange rate dynamic.

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