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How to interpret the forward rate in the foreign exchange market? Horizontalists vs. Structuralists in the open economy[1]

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Abstract

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This paper presents a critical discussion of Post Keynesian contributions to the theories of the exchange rate. It starts by highlighting Keynes' original writings on the foreign exchange market in the *Tract on Monetary Reform*, in which he expresses a view of the forward foreign exchange market now known as covered interest parity (CIP). CIP postulates that interest rate differentials between currencies should be perfectly reflected in FX forward rates. The paper goes on to show that these original writings of Keynes have been given very different, it not opposing, interpretations by Post Keynesian scholars.

We argue that these opposing views of Post Keynesian scholars about the forward foreign exchange market are consistent with the authors' writings on monetary processes in a closed economy and reflect the different views of Horizontalists and Structuralists. More specifically, the**y** reflect the authors' view about the central bank's ability to determine the interest rate in the economy. The paper finishes with the proposition of a general analytical framework with which to understand exchange rate determination from a Post Keynesian perspective that potentially can accommodate both the Horizontalist and Structuralist view of the forward foreign exchange market.

Keywords:
• *Exchange rate determination*
• *Post keynesian*
• *Liquidity preference theory*
• *Interest rate*
• *Developing and emerging countries.*

Clasificación JEL:
B5, F31, F34.

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Resumen

Este artículo presenta una discusión crítica de las contribuciones postkeynesianas a las teorías del tipo de cambio. Partiendo de los escritos originales de Keynes sobre el mercado de divisas en el *Tratado sobre la Reforma Monetaria*, en el que expresa una visión del mercado de divisas a plazo ahora conocido como paridad cubierta de la tasa de interés (PCI). El PCI postula que los diferenciales de tipos de interés entre divisas deben reflejarse perfectamente en los tipos de cambio futuros. El artículo continúa mostrando que estos escritos originales de Keynes han recibido interpretaciones muy diferentes, incluso opuestas, por parte de los autores postkeynesianos.

Se sostiene que estos puntos de vista opuestos sobre el mercado de divisas a plazo son consistentes con los escritos de los autores sobre los procesos monetarios en una economía cerrada y reflejan las diferentes opiniones de los horizontalistas y estructuralistas. Más específicamente, reflejan la opinión de los autores sobre la capacidad del banco central para determinar la tasa de interés. El artículo termina con la propuesta de un marco analítico general con el que entender la determinación del tipo de cambio desde una perspectiva postkeynesiana que potencialmente puede contener tanto la visión horizontalista como la estructuralista del mercado de divisas a plazo.

Palabras claves:

- *Determinación del tipo de cambio*
- *Postkeynesianismo*
- *Teoría de la preferencia de la liquidez*
- *Tasas de interés*
- *Países en desarrollo y emergentes.*

I. INTRODUCTION

The exchange rate and its important repercussions for the real economy are a long-standing concern for Post Keynesian economists. A large part of the Post Keynesian literature on the exchange rate is concerned with the question of exchange rate management, both in developing and emerging countries (DECs) and the international monetary system more generally. In contrast, writings which deal explicitly with the question of exchange rate determination from a Post Keynesian perspective are relatively scarce[3].

One of the few exceptions is Harvey (Harvey, 1991, 2007, 2009), who presents the probably most consistent framework of exchange rate determination from a Post Keynesian perspective to this date[4]. Rejecting the mainstream view of the exchange rate as market equilibrating price and in line with Post Keynesian writers who stress the creative role of expectations, Harvey argues that it is expectations in short-term financial markets which drive exchange rates. Referring to Davidson's (1978) important ontological distinction between calculable probabilities and fundamental uncertainty, these expectations, in turn, are anchored only by social conventions and the confidence with which

3 On the one hand, this could reflect Keynes' own concerns. While returning frequently to the question of exchange rate management, his writings on the process of exchange rate determination are relatively scarce and do not seem to divert significantly from current mainstream exchange rate theory. On the other hand, from a Post Keynesian perspective, the emphasis on the creative role of context and time specific expectations formed under fundamental uncertainty seems to defy a general theory of exchange rate determination.

4 Another important framework to analyse exchange rate dynamics from a Post Keynesian perspective, which will be discussed further below, is proposed by the German Monetary Keynesians, following Hajo Riese (Fritz, 2002; Lüken genannt Klaßen 1993; Riese, 1986, 200)

market participants hold these conventions. In his 2009 book, Harvey complements this view of the expectations formation process with the observation that "…there exist (outside of official intervention) only three reasons to purchase foreign currency: importation of foreign goods and services, direct foreign investment and portfolio investment (Harvey, 2009, p. 83). It is agents' perceptions of these processes, and the base factors and indicators which determine these processes, which determine exchange rates.

This paper aims to complement and further develop existing Post Keynesian exchange rate theory by going back to Keynes' original writings on the (forward) foreign exchange market and putting the emphasis on the underlying mechanisms and structures which shape a monetary economy operating under fundamental uncertainty. As mentioned above, the single focus on expectations under uncertainty might make it very difficult to say anything about exchange rate determination beyond the specific context. Exchange rate drivers are, whatever agents expect exchange rate drivers to be which, in turn, will depend on the specific context and time. This, however, does not mean that such an approach is ultimately theory-less (as claimed by Coddington (1982) for example). Referring to the critical realist ontological claim of deeper structures and mechanisms that are real but are not directly accessible to observation and only discernible through their effects, Post Keynesians authors (e.g. Chick & Dow, 2005; Crotty, 1994; Lawson, 1985) argue that, rather than pinning down objective causal relations and permanent fundamentals as in mainstream exchange rate theory, the analytical aim is to investigate these underlying real mechanisms and structures. Harvey does so implicitly by basing his mental model on the empirical observation that ultimately it is demand and supply conditions in the foreign exchange market which determine the exchange rate. This paper, takes a different route, going back to Keynes' writings themselves.

Indeed, Keynes' analysis of agents' behaviour under uncertainty is not confined to the expectation formation process, but also highlights the implications this uncertainty has for the underlying structures and institutions of an economy. As Crotty (1994, p. 13) points out: "Although individuals' values, preferences, modes of understanding, and so forth are socially constructed, through individual and collective action people transform their decision-making environment over time by, among other things, creating new institutions and adopting new practices designed to reduce the harmful effects of uncertainty". One of the most important institutions in this context is the emergence of money and a monetary economy (Kregel, 1980, p. 46). The exchange rate, however, is nothing other than the relation of domestic to foreign money. If we interpret domestic currency as international money, Keynes offers us a powerful analytical tool to analyse portfolio decisions under uncertainty and, more specifically, the demand for domestic currency: liquidity preference theory and his analysis of the "own rate of interest" in Chapter 17 of the *General Theory*. This paper shows that this interpretation is indeed consistent with Keynes' own writings on the foreign exchange market.

More specifically, this paper has two main objectives. First, in order to develop an alternative view of exchange rate determination from a Post Keynesian perspective, it goes back to Keynes' original writings on the (forward) foreign exchange market in the *Tract on Monetary Reform* in which he expresses a view of the forward foreign exchange market now known as covered interest parity (CIP). It shows how these writings have been given very different interpretations by Post-Keynesians scholars depending on the authors' view on monetary processes in a closed economy. Whereas Mark Lavoie and John Smithin, following the Cambist view of the foreign exchange market and adopting a horizontalist perspective, argue that the forward rate is a simple mark-up on the existing spot rate (given the current interest rate differential), Jan Kregel, assuming a more structuralist perspective, argues that Keynes' writings on the forward market were indeed an early development of his own rate of return and liquidity preference theory, which makes the forward rate an expectational variable. The paper shows how certain assumptions underlying the horizontalist view of monetary processes

might not hold in an open economy which gives some support to liquidity preference theory and the structuralist view of economic and financial processes.

Second, based on Kregel's argument that Keynes' writing on the forward foreign exchange market was indeed an early development of his liquidity preference theory and "own rate of interest" equation, the paper presents an alternative analytical framework to analyse exchange rate determination, in particular in Developing and Emerging Countries (DECs)[5]. This framework does not only point to the important structural features of the international monetary system and the consequences for exchange rate dynamics in DECs, but can account for several of the empirical phenomena observed in foreign exchange markets. Several authors have implicitly or explicitly applied Keynes's liquidity preference theory and "own rate of return" equation to analyse exchange rate dynamics in DECs (Herr, 1992; Davidson, 1999; Dow, 1999; Riese, 2001; Herr and Hübner, 2005; Terzi 2006; Kaltenbrunner, 2008; Prates and Andrade, 2011). This paper shows that this approach can indeed be based in Keynes' original writings themselves and aims to synthesize these approaches in a general analytical framework.

Following this introduction, the second part of this paper sets out Keynes' original writings on the foreign exchange rate market in the *Tract on Monetary Reform*. Section 3 discusses the different interpretations these writings have been given in Post Keynesian writings. Based on this discussion, Section 4 sets out a potential alternative framework to analyse exchange rate determination in DECs. Section 5 concludes.

5 The view of the exchange rate as international money in DECs is particularly warranted by these countries recent currency internationalisation process which has meant that international investors have become increasingly exposed to domestic currency assets, including the domestic currency as an asset class itself (Kaltenbrunner, 2011).

II. KEYNES ON THE FORWARD FOREIGN EXCHANGE MARKET

Keynes' theoretical analysis of foreign currency dealings stems from his first post-war writings (1922), later collected in his *Tract on Monetary Reform* (1923). In chapter 2 of the *Tract* he explicitly deals with the question of exchange rate determination where he, with certain reservations, endorses PPP. Keynes argues that in general the exchange rate adjusts to restore equilibrium between the comparative internal purchasing powers of two countries, which are ultimately determined by their monetary policies. Deviations from this equilibrium condition can occur. These, however, are primarily the result of changes to "real" parameters affecting two countries' trade relations, such as "...movements of capital, or reparation payments, or changes in the relative efficiency of labour, or changes in the urgency of the world's demand for that country's special products, or the like" (p. 80). In addition, seasonal fluctuations, transaction costs and the divergence between tradable and non-tradable goods prices might result in the failure of PPP to hold.

After his (qualified) endorsement of PPP, Keynes goes on to set out his view on the currency forward market in Chapter 3 of the *Tract*, a view which is today reflected in the covered interest parity (CIP) theorem. Keynes writes: "If dollars one month forward are quoted cheaper than spot dollars to a London buyer in terms of sterling, this indicates a preference by the market, on balance, in favour of holding funds in New York during the month in question rather than in London – a preference the degree of which is measured by the discount on forward dollars" (Keynes, 1923, p. 102). This preference is caused by interest rates obtainable on "short" money, i.e. money lent or deposited for short periods of time in the money markets of the two centres under comparison. "...Forward quotations for the purchase of the currency of the dearer money market tend to be cheaper than spot quotations by a percentage per month equal to the excess of the interest which can be earned in a month in the dearer market over what can be earned in the cheaper" (p. 103).

Following Lavoie (2002) Keynes' description of the forward market can be expressed as

(1) $i - i^* = f - e$

Where i is the domestic interest rate, i^* is the foreign rate of interest, e is the logarithmic value of the spot exchange rate (defined as the domestic currency price of one unit of foreign exchange), and f is the logarithmic value of the forward exchange rate[6]. With small enough differentials in interest rates the Taylor expansion yields these approximate equalities (Lavoie, 2000). Maturities on the relevant asset and the forward contract coincide. CIP postulates that interest rate differentials between currencies should be perfectly reflected in FX forward rates (or the difference between the forward and the spot rate). Currencies with higher interest rates should trade on a forward discount (f-e>0), whereas currencies with lower interest rates trade on a forward premium (f-e<0)[7].

For mainstream exchange rate theory covered interest parity is maintained through international arbitrage. In addition, the forward rate reflects rational exchange rate expectations, giving the well known uncovered interest parity (UIP).

(2) $i - i^* = e^e - e$

Thus, the gain/loss on the interest rate differential in one country is exactly offset with an equal loss/gain on the expected exchange rate. Two possible mechanisms restore parity: either, rational speculators buy/sell the currency forward until $e^e = f$. The implicit premium/discount attracts interest arbitrageurs which restore UIP through their effect on interest rates (Coulbois & Prissert, 1974). Alternatively, rational expectations are set endogenously to UIP automatically restoring equilibrium on international money markets (e.g. Dornbusch, 1976). In both cases the forward rate should be a good predictor of future spot rates, a result which has been met with little empirical success (Jongen et al., 2008). Indeed, not only is the forward rate a bad predictor of future spot rates, but the currencies of countries with positive interest rate differentials were found to appreciate rather than depreciate (a result also known as the forward premium discount puzzle, which has been most recently evidenced by the notorious carry trade phenomenon).

The most common theoretical device to save UIP in the face of conflicting empirical evidence has been the introduction of a time-varying risk premium (ρ).

(3) $i - i^* = (e^e - e) + \rho$ and $f = e^e + \rho$

Again, however, with little empirical success (Jongen et al., 2008).

More empirical support seems to exist for CIP (e.g. Baba & Packer, 2009; Coulbois & Prissert, 1974; Frenkel & Levich, 1975; Taylor, 1987). Indeed Coulbois and Prissert (1974) and Lavoie (2000) argue that CIP in international money markets has been shown to hold nearly perfectly. According to the authors, those studies which found large intrinsic discounts/premiums have considered inappropriate interest rates, such as Treasury bill rates or medium to long-term bond rates. Indeed, Keynes (1923) explicitly wrote about short-term money markets where considerations such as default or credit risk are thought to be less prevalent. However, Keynes also acknowledged that, due to political or financial instability which raises concerns about the viability of the domestic banking system and/or the free transferability of funds, implicit discounts on a currency might arise. In this vein, Baba and Packer (2009) show that fear about the liquidity and solvency of banks lead to temporary deviations from CIP during the international financial crisis.

6 For Keynes, the Pound Sterling is the home currency. Given the primacy of the Pound Sterling at his time, other currencies are expressed with reference to it. Thus, to fully reflect his considerations on CIP the equation would have to be written as . To express the viewpoint of DECs, whose currencies are most of the time quoted in units of the foreign currency (primarily the US$), Lavoie's expression has been used.

7 In analogue to the previous footnote, whether a forward premium/discount assumes a positive or negative value depends on the quotation of the currency. If the exchange rate is expressed in units of the domestic currency (as it is often done by North American writers) the forward premium will assume a positive value whereas a discount will be negative.

III. POST KEYNESIANS ON THE FORWARD FOREIGN EXCHANGE MARKET

Post Keynesian theory offers three possible interpretations of Keynes' interest parity theorem and the empirical evidence on covered and uncovered interest parity. One strand of Post Keynesian writings, which will be discussed in less detail here, emphasises the absence of rational expectations and importance of uncertainty to account for the empirical failure of UIP (Harvey, 2004). In this view, a situation might arise in which aggregate investors (speculators) believe that the return that can be earned in one nation exceeds that in another, but they lack the conviction and/or confidence to act. Thus, in this interpretation, exchange rate expectations continue to be formed endogenously with respect to interest parity. In addition, the forward rate remains a representation of exchange rate expectations. A second, and completely different view of Keynes' writings on the forward foreign exchange market, is given by Mark Lavoie and John Smithin.

III.1. Mark Lavoie, John Smithin, and the Cambist View

Mark Lavoie (Lavoie, 2000, 2002) and John Smithin (Smithin, 2002), following the so called Cambist view of the foreign exchange market (Coulbois & Prissert, 1974), reject the view of the forward rate as expectational variable altogether[8]. In this view, exogenously given exchange rate expectations are directly reflected in the current spot rate, which is then marked up by banks with the existing interest rate differential to derive the forward rate. More concretely, Coulbois and Prissert (1974) argue that for hedging purposes every forward transaction by a bank has to be "married" by a spot transaction in the same direction[9]. In most cases, however, this spot transaction has to be funded on international money markets; this funding operation creates a cost (or profit) for the bank, depending on the existing interest rate differential, which it will charge (discount) in the form of a mark-up over the current spot rate, resulting in the quoted forward rate[10]. Thus, in contrast to what is argued in mainstream theory, in this view CIP does not result from arbitrage operations of international investors, but is the outcome of a pure arithmetic operation as banks charge their customers forward rates which reflect the spot rate plus a markup mirroring the interest rate differential. Interest rates are exogenously set by the central bank, which implies that speculators' exchange rate expectations are immediately reflected in the spot rate through the covering sales of banks[11].

Moreover, while in the mainstream argument deviations from CIP are necessary to create profit opportunities for international arbitrageurs (and might last for a while if this arbitrage is not sufficient), in the Cambist view CIP has to hold nearly perfectly. At the same time, the forward rate cannot have any predictive value for the future exchange rate, which, if interest rates are assumed to be constant, is only determined by current exogenous exchange rate expectations. Thus, in this view, the forward rate has little to do with exchange rate expectations, but is simply a "residual" given the spot rate and existing interest rate differential[12].

8 See also Moosa(2004) for empirical evidence of this view.

9 This assumes that the bank does not speculate on the currency but hedges all its currency exposure.

10 Nowadays, most of the time banks will probably do these operations with a swap, which, however, does not change the general argument.

11 Acknowledging the counterparty operations of banks also implies that in the Cambist view of covered interest arbitrage only speculative (uncovered) forward operations can have an effect on the spot rate. In the case of covered forward transactions (a simultaneous forward and spot transaction) a bank which executes the forward transaction for the customer – if it cannot match the transaction with an offsetting order given by another customer – has to cover itself through sales (purchases) on the spot market, which exactly meet the initial spot purchases (sales) of the arbitrageurs. Thus, the two spot transactions cancel each other out, which leave the spot rate unaffected. This is in contrast to the neoclassical account where deviations from interest parity lead to a simultaneous spot and forward transaction by arbitrageurs, which causes a movement in both the spot and forward rate.

12 In this context, Smithin(2002) argues that the Cambist view is actually much stronger than the neoclassical view as it does not rely on capital mobility argument as such. This, however, is only partly true. In the presence

The Cambist approach is an insightful account of the forward foreign exchange market and reflects the workings of this market under certain market conditions. It is consistent with the Post Keynesian view that exchange rate expectations are not rationally formed to equilibrate markets, but are autonomous and exogenous variables. In addition, it shows the importance of short-term interest rates for exchange rate movements and reflects the determining character of exchange rate expectations for *current* exchange rate movements[13]. Indeed, the Cambist view can easily accommodate the carry trade phenomenon (in the sense that short-term interest rates result in sustained exchange rate appreciation). However, it is at loss when it comes to currency crisis, where central banks try to stabilize the value of their currencies through interest rate policies. In a similar vein, as discussed in more detail below, while the assumption of an independent monetary policy and freedom to set the interest rate might be valid for developed countries, this might not hold for DECs.

Finally, it is important to mention, that the Cambist view is not a theory of exchange rate determination. What the Cambist view determines is not the spot rate or forward rate individually, but the forward premium. As such, there is a "loose end in the analysis" because "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" (J. Smithin, 2002, p. 225). For Lavoie (2000) this demand for currency is primarily the result of expected exchange rate changes, which are formed exogenously to the model and caused by news, "which is interpreted one way or another depending on the whims of foreign exchange dealers" (p. 175).

of capital controls, forward rates in domestic and foreign markets might differ as banks only have access to either market which might be characterised by different interest rates (Lavoie, 2002).

13 That is in contrast to mainstream theory where exchange rate expectations cause *future* spot rates. Rational expectations theory contends that and should only differ by some random error. The Post Keynesian approach argues that determines (Harvey, 1998).

III.2. Jan Kregel and the Own Rate of Return View

A completely different interpretation of Keynes' writings on the forward foreign exchange market is given by Kregel (1982). For him, Keynes' writings on the forward foreign exchange market should be seen as an early application of his "own rate of interest" equation, which he later developed in Ch. 17 of the General Theory, in the international context. Aiming to show that Keynes' "own rate of interest" is a theory of general asset choice, rather than a dichotomous selection between money and bonds such as in Tobin (1987), Kregel points out that if one considers domestic currency (sterling) as "the 'money' of the system with durable assets comprised of foreign currency", Keynes' interest parity theorem "provides an explanation of the "preference" for 'liquidity' (sterling) influencing decisions to take positions in other (foreign currencies) assets in terms of their spot and forward prices relative to the sterling" (p. 454). Just as the rate of interest measures the "premium" the market is willing to pay for its preference for liquidity provided by money in a closed economy, the rate of interest on foreign currencies shows the price investors are willing to accept to part with the security provided by the money of the system in an open economy14. And just as in Keynes' closed economy of the General Theory, this "premium" or money rate of interest is "nothing more than the percentage excess of a sum of money contracted for forward delivery, e.g. a year hence, over what we may call the 'spot' or cash price of the sum thus contracted for forward delivery" (Keynes 1997: 222). Indeed, Keynes writes himself: "…it may be added that, just as there are differing commodity-rates of interest at any time, so also exchange dealers are familiar with the fact that the rate of interest is not even the same in terms of two different moneys, e.g. sterling and dollars. For here also the difference between the "spot" and "future" contracts for a foreign money in terms of sterling are not, as a rule, the same for different foreign moneys" (Keynes 1997: 224).

14 Implicitly, this interpretation of Keynes' interest parity is also adopted by Taylor (2004).

The view that Keynes' writing on the "own rate of interest" has to be seen as a theory of general asset demand, which found its antecedent in Keynes considerations on the foreign exchange forward market, is also advanced by Carvalho (1992). Carvalho (1992, p. 79) writes: "In a nutshell, the theory says that, for any given durable good, the divergence between its spot and forward prices, that is between the current price for current delivery and the current price for delivery at a specified future date, will reflect the expectation of the market as to the gains to be derived from its possession between the present moment and the specified future date" (p.79).

Two considerations follow from this interpretation of Keynes' writings on the forward foreign exchange market. First, in contrast to the view put forward by the Cambist School, and more closely related to the mainstream approach discussed above, in this view of Keynes' covered interest parity, the forward rate is again a reflection of exchange rate expectations. However, in contrast to the mainstream approach, these expectations are not formed endogenously to the model to restore equilibrium on international money markets, but reflect (expected) returns on the currency itself. These expectations, in turn, and again in contrast to the Cambist School, are largely reflected in the interest rate differential between the two countries under consideration, rather than the spot rate itself.

Second, following Kregel's interpretation, Keynes' writing on the forward foreign exchange market is an explanation of the demand for domestic currency relative to foreign currency, primarily with respect to the currency or money of the system. The domestic currency is considered an asset whose demand is determined by its net return relative to other currencies. The exchange rate, as the relation between domestic and foreign money, is a manifestation of these differential returns. Thus, this view lays the basis for an alternative explanation of exchange rate determination in a Post Keynesian framework.

III.3. Explaining the Differences

It seems puzzling that Post Keynesian writers have a very different, if not opposed, view of the nature of the forward rate in the foreign exchange market. While for the Cambists' Lavoie and Smithin the forward rate had nothing to do with exchange rate expectations, but was the result of a simple mark-up, applying Keynes' liquidity preference theory to the foreign exchange market the forward rate is a reflection of *expected* conditions on this market just as *expected* conditions "determine the size of the offer to repay money in excess of the sum borrowed" (Kregel 1982, p. 456). These differences reflect the opposing views of Post Keynesian authors, i.e. Horizontalists vs. Verticalists, about the role of liquidity preference in a closed economy.

Theories of endogenous money hold that the money stock in an economy is not exogenously determined by the central bank, but endogenously given by the "real economy". For "Horizontalists" or strong proponents of endogenous money banks simply transmit this real sector money demand, which, in turn, is fully accommodated by the central bank. Given that any change in money demand can (and will be) fully accommodated by the central bank, the interest rate cannot be an outcome of private sector portfolio decisions. In other words, liquidity preference theory can only hold in the presence of a fixed money supply. If the money supply is not fixed, the central bank has full autonomy over setting the policy or wholesale rate, which is subsequently marked-up by the banks when meeting the private sector demand for credit (Arestis & Eichner, 1988; Lavoie, 1984; Moore, 1988; Smithin, 1994; Wray, 1992). On the other hand, Structuralists, such as Minsky (1975), Dow (1996), Chick and Dow (2002), Bibow (2013), and indeed Kregel (1980; 1982), give some role to Keynes' liquidity preference theory. These authors argue that interest rates are not only exogenously set by the central bank, but are partly endogenous and reflect expected market conditions, primarily through the liquidity preference of banks[15]. In this view, banks do no passively accommodate money

15 Some authors also attribute a liquidity preference schedule to the central bank itself and households (see Fontana (2009) for a summary)

demand from the real sector, but might raise the price of departing with liquidity (money), i.e. the interest rate, depending on their own liquidity preference schedule and balance sheet considerations. As a result, even in the presence of a totally accommodative money supply (reserves) monetary authorities will not be able to exert total control over domestic interest rates.

Lavoie's/Smithin's and Kregel's different interpretations of Keynes' writings on the forward foreign exchange market seem to reflect exactly this divide. For Lavoie and Smithin, adopting a horizontalist standpoint, it is important to show that even in an open economy in the presence of freedom of capital movements, central banks maintain the autonomy to set interest rates. Interest rates are a policy variable and not the outcome of private sector portfolio decisions. This means that exchange rate expectations have to be immediately reflected in the spot rate and the forward rate is marked up with an exogenously given interest rate differential. Kregel, in turn, assumes a role for liquidity preference, which means that expected monetary conditions (or exchange rate expectations) are reflected in the interest rate through private sector portfolio decisions.

Now, the question remains which interpretation is a better reflection of the working on 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, in particular in the moment of financial crisis.

On the theoretical level, Lavoie (1996) argues that the different views of liquidity preference presented above are primarily one of nuances and depend significantly on the type of interest rate under consideration. In this vein, he holds that while Post Keynesians might disagree about the spread between the base rate and lending rate, i.e. the role of banks' liquidity preference schedule, most would agree that the central bank rate can be considered exogenous, because the central bank, as sole issuer of legal tender, can accommodate any increased demand for money through rising bank reserves, i.e. money supply (Lavoie 1996). This argument, however, hinges fundamentally on the assumption that the central bank can accommodate any rising demand for money, i.e. act as a residual supplier of liquidity or lender of last resort (Fontana, 2009), which might not hold in the international context. Indeed, as will be discussed in detail in the next section, 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. This might make it necessary to increase the base rate in the face of changing liquidity preference and/or a deterioration in the currency's liquidity premium[16].

IV. AN ALTERNATIVE ANALYTICAL FRAMEWORK

As Kregel suggested, Keynes' liquidity preference theory and "own rate of interest" can be applied to – and indeed found its antecedents in – the international context where sterling was *the* money of the system while other currencies represented alternative durable assets. In this view, Keynes' writing on the forward foreign exchange market is a theory about the demand for different currencies under uncertainty determined by its net return relative

16 Keynes' view seems to lie somewhere in between. On the one hand, he acknowledges the important role of banks and their covering operations in forward transactions(Keynes, 1923, p. 106). On the other hand, in line with the mainstream approach, for him CIP is clearly based on an international arbitrage argument. As a result, sustained deviations from CIP due to strong speculative trading and a lack of arbitrage operations are possible (Keynes 1923: 107). Finally, in contrast to the Cambists' argument, in Keynes' view exchange rate expectations are reflected in forward rates through the operations of speculators. However, these exchange rate expectations are not formed in accordance with interest rate parity, but are exogenously given.

to the currency of the system. Following Keynes' own rate of return equation this return is constituted by its carrying cost adjusted yield, its expected appreciation against the currency of the system and finally its liquidity premium, i.e. the ability to convert the currency quickly and without loss of value in the money of the system. "In equilibrium" this return should be equal to the return offered by the currency with the highest liquidity premium, i.e. the money of the system (indicated by *).

(4) $(q - c) + a + l = l^*$

At a given liquidity preference, changes in any of the four elements of a currency's net return, without a counteracting adjustment of the other elements, will alter the demand for domestic currency and lead to exchange rate movements[17].

As in the case of money proper, carrying costs are very small for the domestic currency and/or short-term financial instruments and can thus be safely ignored. A currency's yield, or the returns on domestic currency instruments, on the other hand, are crucial to explain exchange rate dynamics once the domestic currency is considered to be an international asset class. While domestic money is held because of its liquidity premium, the currency as international money might have to offer higher returns to (international) investors to compensate for its lower liquidity premium relative to other currencies. This is particularly the case in the moment of crisis when liquidity preference increases and/or investors' doubt their ability to exchange the currency quickly and at no loss against *the* money of the system. On the other hand, the currency with the highest liquidity premium can offer the lowest return and target monetary policy to domestic economic conditions (the "exorbitant privilege" of the reserve currency as de Gaulle called it). While in Keynes' original writings interest rates in short-term money markets were the main yield factor, this can, in principle, be extended to the return on any short-term domestic currency denominated financial asset provided its liquidity is high enough to be close enough in its properties to money[18].

The second return element in the case of short-term domestic currency investments are expected changes in the currency itself ($a = e^e - e$) (Davidson 1999). In line with Harvey's writings on the foreign exchange market, the formation of these exchange rate expectations will be context and time specific, primarily anchored by social conventions. In addition, given the reigning uncertainty, social conventions can be subject to sudden changes depending on psychological processes described by Keynes in its famous "beauty contest" and animal spirits, which can lead to trading behaviour characterised by herding, momentum or simple feedback trading (Harvey, 2009; Tversky & Kahneman, 1974).

The single focus on short-term return considerations, however, does not satisfactorily capture the complex nature and role of money in economic relations. In Keynes' writings money is held because it is a secure abode of purchasing power which transfers wealth in a world of uncertainty and allows meeting contractual obligations (Davidson, 1978). The emphasis on currencies' differential liquidity premia highlights the structured and hierarchical nature of the international monetary system. While in a closed economy domestic money is the most liquid asset, in the international context this role might be fulfilled by another currency, which better fulfils international monetary functions and acts as the international medium of contractual settlement. In addition, the emphasis on currencies' differential liquidity premia can explain exchange rate movements, seemingly independent of domestic economic conditions. As Dow (1999) points out in her application of Keynes' liquidity preference to the international context, changes in

17 Although Keynes's "own rate of interest" evokes an equilibrium concept, it is not guaranteed that this equilibrium is ever achieved. Changes in returns and demand for the currency will set forces in motion which by themselves change the same returns, keeping things in steady motion. In addition, the emphasis on expectations under uncertainty also means that there is no equilibrium level towards which the domestic currency will tend (Carvalho 1984–85).

18 Keynes (1997) himself pointed out that the line between "money" and "debts" can be drawn at whatever point is most convenient for handling a particular problem.

agents' liquidity preference can lead to exchange rate movements entirely independent of changes in domestic economic conditions. A change that will be particularly marked in those currencies with a lower liquidity premium.

More concretely, adopting a view of the exchange rate as international money and recognising liquidity preference theory as a general theory of asset choice, the demand for domestic currency and thus exchange rate dynamics is determined by the ability of domestic money to meet the three motives of holding liquidity – the transactions motive, the speculative motive and the precautionary motive – relative to other currencies. Given that the emphasis is on financial investors expectations' in Post Keynesian exchange rate theory, less emphasis will be placed on the transaction motive. The speculative motive is analytically still closer to the short-term return elements discussed above, whereas the precautionary motive draws attention to the structural determinants of a currency's liquidity premium.

Speculation and the speculator are recurrent themes in Keynes' *General Theory*. For Kaldor (1939) Keynes' "own rate of interest" was the attempt to present a general theory of speculative asset demand, drawing together his writings on liquidity preference in Chapter 13 and 15 of the *General Theory,* and Ch. 12, where establishes the famous distinction between the purchase of securities for resale at a higher price, which he termed speculation, and enterprise, buying securities for long-term income (Toporowski, 2005). Kaldor argues that an asset has to have two main properties to be demanded for speculative purposes: low carrying costs and a perfect or semi-perfect market. The condition of low carrying costs is framed with reference to Keynes' "own rate of own interest". Leaving liquidity premium aside, net carrying costs, defined as carrying costs minus the yield of an asset (c-q), are the significant concept for explaining the existence of speculation in certain goods. The second attribute required to make a good a suitable object of speculation is a "perfect or semi-perfect market" understood as "perfect marketability", which comes close to what Keynes refers to as "liquidity" in certain parts of the *General Theory.* Both conditions, Kaldor argues, are especially satisfied by future claims or titles to property, bonds and shares. Their low carrying costs and the existence of liquid markets make financial assets, including foreign exchange, primary objects of speculation[19]. This point is also made by Chick (1983), who argues that as a result of their lower transaction costs, active markets and huge potential gains, foreign exchange has become a prime speculative target in recent years[20].

Kaldor's and Chick's discussions of speculation focus on the asset side of international balance sheets. The emphasis is slightly different in Minsky's (1975) treatment of the speculative motive where future developments of asset prices are crucial to generate a cash flow to meet outstanding obligations. This emphasis on the liability side of balance sheets, and the precautionary element of money demand, form the second element of a currency's liquidity premium.

The notion that different currencies have different liquidity premia which creates a hierarchy between them has been pointed out by several authors (Carneiro 2008; Terzi 2006; Prates and Andrade 2011). Probably the most systematic analysis has been provided by the German "monetary Keynesian" school after Hajo Riese (1986, 2001), such as Herr (1992), Lüken genannt Klaßen (1993) or Herr and Hübner (2005). Monetary Keynesians

19 A slightly different application of Keynes' speculative demand to the international context is presented by Dow (1999). Dow sticks closer to the original definition of the speculative demand for money and argues that US$ are held to take advantage of speculative gains in other currencies and/or short-term financial assets.

20 Chick, however, is also concerned about the theoretical significance of speculation in an asset. For her, "the theoretical importance of speculation in the *General Theory* was that it provided a theory of the general level of interest rates" (p. 209). This paper has shown that this reasoning could be applied to the international context as the domestic central bank is restricted by its foreign exchange reserves to accommodate demand for "money", which makes, at least under certain conditions, the interest rate an outcome of private sector portfolio decisions.

explicitly reject the notion that exchange rates are driven only by short-term speculative expectations, primarily governed by animal spirits. For these authors, demand for a currency is fundamentally determined by investors' medium term assessment of its "currency premium". This currency premium, in turn, is the result of a currency's ability to store wealth relative to other currencies. Based on this view, Herr (1992) specifies "Keynesian fundamentals", which reflect a country's expected economic policy and its commitment to maintain the stability of the currency. This includes factors such as the willingness and ability to fight inflation, defend the currency in a crisis, or the exchange rate regime in place.

The ability to store wealth is an important element of a currency's liquidity premium. However, this paper would argue that focusing solely on the asset side of international balance sheets has a few shortcomings. Firstly, it does not entirely explain the position of a currency on the top of the international currency hierarchy. There are many value stable currencies, but only one stands at the apex of the international currency hierarchy. Secondly, this paper would argue that the single focus on the store of wealth function misses the important structural and relational aspects of international finance. Money is credit money which establishes relations between debtors and creditors. These relations have important repercussions on the position of a currency in the international monetary system. Following Minsky (1975) this paper emphasises the liability side of international balance sheets in the determination of a currency's liquidity premium. In this view, a currency's liquidity premium is determined by its ability to meet outstanding obligations. In the domestic context this is the ability to convert an investment anytime and without loss of value into money, the unit of account and denominator of contractual obligations (Carvalho, 1992). In an open economy, liquidity becomes the ability to convert domestic assets into the currency with which positions in these assets have been funded and transfer the foreign currency abroad to meet external obligations.

This emphasis on the liability side of international balance sheets does not only help to explain a currency's position on the top of the international currency hierarchy, but also allows one to specify structural factors which determine a currency's liquidity premium, particularly in the context of DECs.

As to the former, historical evidence shows that both currencies at the pinnacle of the international monetary system, the Pound Sterling and US$, were the two main creditor currencies of their times (Keynes 1971a; Keynes 1971b; Kregel 1982; Herr 1992; Minsky 1993). Both countries registered large medium to long-term capital outflows, whose income financed (eventual) deficits on the trade balance. Yet, while economic agents cannot be forced to hold their assets in particular currencies, they can be forced to assume their liabilities in them. However, "as eventually international indebtedness will be denominated in the currencies of the countries with large offshore assets, they must also accept that their currency will be a reserve currency of their debtors, for it is convenient to hold liquid assets in the currency in which your debts are denominated" (Minsky, 1993).

As a result of path dependency and the primacy of their financial sectors, the Pound Sterling, and nowadays the US$, remain the main denominators of international debt contracts and reserve currencies even after their countries ceased to be the main creditor nations. According to the Bank of International Settlements, in mid 2012 approximately 60% of foreign currency liabilities of internationally operations banks were denominated in US$. This primacy of the US$ in denominating international financial transactions and its role as main international funding currency, however, cements existing currency hierarchies as any change in international funding conditions, e.g. as a result of a change in international liquidity preference, will raise investors' demand for US$ to meet their outstanding external obligations. Investment currencies, in turn, will depreciate undermining their ability to act as stable unit of account and consequently their liquidity premium. This reduction in a currency's liquidity premium *vis-à-vis* the main funding

currency will be more marked the higher the potential funding needs. Thus, in line with the theoretical argument presented above, investors' perceptions about a currency's liquidity premium will be fundamentally influenced by its ability to meet outstanding external obligations. According to this paper, three structural factors determine this ability, i.e. a currency's liquidity premium.

The first is a country's total stock of net (short-term) external obligations. Traditionally, the link between exchange rate dynamics and a country's external liabilities has been analysed in the context of foreign currency denominated debt obligations, such as in the Latin American debt crisis and the more recent Asian crisis (Arestis & Glickman, 2002; Kregel, 2004, 2009; Palma, 1998). Smithin (2002), Smithin and Kam (2004) and Paraskevopolous et al. (1996) explicitly endogenise a currency's liquidity premium according to a country's ratio of foreign debt to GDP. In the face of foreign currency denominated debt, exchange rate changes have an immediate effect on a country's real debt burden and debt servicing costs, potentially leading to illiquidity or even solvency problems. In addition, liabilities denominated in foreign currency exert a latent depreciation pressure on the currency in order to generate the foreign exchange necessary for debt service (including both interest payments and amortisations) (Keynes' transfer problem). More recently, Kaltenbrunner and Painceira (2010) have pointed out that not only foreign currency debt, but any liabilities to foreign investors can lead to large exchange rate movements (often entirely independent of domestic economic conditions), which undermine a currency's ability to act as stable unit of account and thus its liquidity premium.

The second and third structural element of its currency's liquidity premium are determined by a country's ability to meet its outstanding liabilities through "forcing a cash flow in its favour" (Minsky, 1975, 1986). According to Minsky, this cash flow can be generated either through the income generation process (including income from previous lending) and/or dealing and trading in capital assets and financial instruments. As to the former, in the international context, this becomes the ability to generate the necessary foreign exchange to meet one's payment commitments without sharp changes in the exchange rate (Herr and Hübner 2005). For both Minsky (1993) and Herr (1992), this "foreign exchange productivity" is a function of balance of payments flows, in particular the current account as a country's autonomous source of foreign exchange.

Finally, if current cash flows are insufficient to meet outstanding obligations, the ability to "make positions", i.e. to refinance existing debt and/or to liquidate assets, becomes an important determinant of an asset's liquidity (Minsky 1986). In the international context this becomes the ability to quickly and at low cost convert the domestic asset into the funding currency, which brings the "institutional" liquidity of a market to the fore (Carvalho 1992). This institutional liquidity comprises a myriad of factors, including the properties of an asset itself, the structure of a market, and the agents operating in this market. In addition, it highlights the important role of a market marker and ultimate provider of liquidity, i.e. the central bank and its available foreign exchange reserves (Davidson, 2002).

V. CONCLUSIONS

This paper has presented an alternative analytical framework to analyse exchange rate determination in DECs from a Post-Keynesian perspective based on Keynes' liquidity preference theory and "own rate of return" equation. While several authors have (implicitly or explicitly) applied this framework to analyse exchange rate dynamics in DECs, this paper has shown that this framework can indeed by grounded in Keynes' own writings, following a Structuralist interpretation of his writings on covered interest parity.

Applying Keynes' liquidity preference theory to the foreign exchange market can account for some of the structural characteristics of the international monetary system and exchange rate dynamics in DECs' more generally. For example, it points to the structured and hierarchic nature of the international monetary system, where currencies' with

a lower liquidity premia might have to offer higher interest rates in order to maintain demand for their currencies. In addition, it can account for sudden and large exchange rate movements, largely independent of domestic economic conditions, as international liquidity preference changes. Based on Minsky's definition of liquidity as the ability to meet outstanding obligations, this paper specified several "structural" elements which determine a currency's liquidity premium. In particular, it highlighted the importance of a country's external obligations and the ability to meet those obligations either through the generation of foreign exchange through the current account and/or the "institutional" liquidity of a market for a currency's liquidity premium.

Keynes' own rate of return equation can also accommodate the changing empirical causality between short-term interest rates and currency movements and thus Horizontalists and Structuralists different interpretations of Keynes' covered interest parity and workings of the foreign exchange market more generally. At times were the liquidity premium is constant, or changes only slowly as in the Horizontalist interpretation of monetary dynamics, interest rates become the driving moment of currency demand. This has been the case, for example, in the recent carry trade period, where high interest rates and expected exchange rate appreciation have led to continuous exchange rate appreciation. On the other hand, a substantial change in a currency's liquidity premium (or liquidity preference) might require an adjustment in interest rates to maintain the demand for the currency as it is the case in Structuralist accounts. This is particularly the case in the moment of crisis[21].

Finally, it is important to point out that while this paper has pointed to several potential structural drivers of exchange rate dynamics in DECs, in line with the critical realist methodology adopted in this paper, their exact empirical manifestations will be context and time specific or might not be apparent at all. For example, while a country's ability to meet its outstanding external obligations has been identified as an important driver of exchange rate movements in DECs, the exact manifestation of these liabilities might change from country to country. Whereas Eastern European countries experienced large and sudden exchange rate movements as a result of foreign currency private sector debt (similar to the Asian crisis), Brazil's currency suffered due to foreigners' large exposure on the domestic futures market. Although the empirical manifestations were different, the structural vulnerabilities were the same: as the international financial crisis hit and funding conditions tightened foreign investors had to convert their investments into the funding currency, primarily the US$, leading to large and sudden exchange rate movements in DECs.

21 The argument that the Horizontalist and Structuralist can indeed be accommodated in one framework, depending on whether expectations (liquidity premium/preference) are constant or not, is close to Fontana's (2010) synthesis' of Horizontalists and Structuralists in the closed economy.

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