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Currency Risk Premiums: A Multi-horizon Perspective

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ABSTRACT

We review the literature on multi-horizon currency risk premiums. We show how the multi-horizon implications arise from the classic present-value relationship. We further show how these implications manifest themselves in the interaction between bond and currency risk premiums. This link is strengthened by explicitly accounting for stochastic discount factors. Information about currency risk premiums at different horizons presents a wealth of new evidence and challenges for existing models.

Keywords: Bond return, bond risk premium, currency excess return, currency risk premium, expectations hypothesis, foreign exchange rate, forward exchange rate, monetary policy, nominal exchange rate, present-value approach, real exchange rate, spot exchange rate, stochastic discount factor, uncovered interest rate parity.
JEL classification codes: E43, E52, F31, G12, G15.

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Introduction

A long-standing issue in international finance is the source of variation in foreign exchange (FX) rates. While intuitive, the connection between macroeconomic fundamentals and exchange rates, also known as the FX macro disconnect, is weak, so an approach based on financial markets appears promising. This leads researchers to consider the classic present-value paradigm suggesting that exchange rates move either due to news in cash flows (i.e., the difference between foreign and domestic interest rates, driven by various fundamentals) or due to news in discount rates (i.e., currency risk premiums). In this survey, we argue that understanding currency risk premiums over different horizons offers a fresh view of movements in exchange rates.

The present-value relationship is typically used to decompose the variation in the current exchange rate into the cash-flow and discount-rate effects. In Section 2, we apply that same relationship to the currency depreciation rate over several horizons. The resulting expression reveals the connection between expected depreciation rates and the combination of cross-country differences between sovereign bond yields and their risk premiums as well as currency risk premiums. Thus, multi-horizon depreciation rates compel us to study the properties of international bonds. In turn, this endeavor could bring a wealth of useful spillovers from theories of bond risk premiums, which are motivated by violations of the expectations hypothesis (EH), to various theories of currency premium determination. Such theories are usually motivated by single-horizon evidence, such as violations of uncovered interest rate parity (UIP).

Studying bond risk premiums leads us to consider stochastic discount factors (SDFs) in Section 3. The price of an n-period bond equals the expectation of the n-period SDF, which, in turn, is a product of n one-period SDFs. Thus, knowledge of the SDF delivers a whole collection of bond prices at different horizons and the corresponding yield curve. Knowledge of the yield curve is helpful in identifying empirically relevant properties of the SDF.

If financial markets are complete, exchange rates are closely connected to the SDFs as well. In logs, the currency depreciation rate is famously equal to the difference between the foreign and domestic SDFs. The result is labeled the asset market view (AMV) of exchange rates. If one does not believe that markets are complete, it is still possible to use a variant of this result to express the domestic SDF in terms of foreign currency and, therefore, use it to price foreign bonds (or other assets) or to evaluate the conditional implications of cross-sectional models of currency excess returns. Lastly, the SDF approach allows one to think about the long-run connection between the SDFs and the depreciation rates. In particular, if the exchange rate is stationary then UIP holds at the long horizon.

In light of the FX macro disconnect, the AMV offers a tantalizing potential to use financial market information to infer exchange rate dynamics. In Section 4, we discuss how one could use bonds to implement the AMV empirically. The key challenge is that models that successfully fit bond yields are far from generating anything resembling the actual exchange rate dynamics. This happens because bonds do not span exchange rates. While one can accommodate this feature in empirical models, it implies that the AMV cannot be implemented, at least not when using conventionally available bond data. This conclusion has important implications for how to go about modeling exchange rates in general equilibrium.

Another important aspect of multi-horizon currency properties is the pattern of UIP violations. The pattern of coefficients relating the current interest rate differential to the currency risk premium over a given horizon is non-monotonic. It is referred to as a reversal because the correlation between the expected currency depreciation and the interest rate differential changes sign from negative to positive at intermediate horizons and then converges to zero at long horizons. Section 5 presents a bond-modeling framework that can capture this evidence by seriously considering the long-run purchasing power parity (PPP) and stationarity of the real exchange rate (RER). The RER should predict currency risk premiums in addition to the UIP's interest rate differential as a result of the cointegration between the nominal exchange rate (NER) and domestic and foreign price levels associated with its stationarity.[1] Furthermore, information in international bonds implies that risk premiums co-move with the RER.

Monetary policy has important implications for bond prices. Given the close connection between bonds and exchange rates, it is natural to wonder how monetary policy affects the latter. In Section 6, we review emerging attempts to connect the two. A natural starting point would be to complement an endowment economy with the Taylor rule. While such a framework can make useful progress in capturing UIP and EH violations, it runs into problems when capturing UIP departures at multiple horizons. Furthermore, it cannot accommodate unconventional monetary policy such as quantitative easing (QE). An intermediary-based approach appears to be more promising as it separates the properties of the marginal rate of substitution (of the intermediary) from those of aggregate consumption.

Most FX research focuses on the G10 currencies because of the high-quality data readily available for them. The natural question is whether the lessons from such studies carry over to emerging-economy currencies. In Section 7, we review research on UIP violations and develop novel evidence regarding the multi-horizon UIP. The evidence is intriguing, as the UIP coefficient has a different sign and the multi-horizon pattern is

[1]Even if the RER is not stationary, a close connection between the NER and the domestic and foreign price levels still exists, leading to similar conclusions at the cost of additional modeling effort.

monotonic. We discuss possible explanations of these phenomena with a particular focus on the role of sovereign credit risk, which is basically non-existent in the G10 world.

There are several reviews of exchange rates, currency risk premiums, and international bond risk premiums: see the collection of chapters in James *et al.* (2012) (in particular, the chapter by Lustig and Verdelhan, 2012) and Engel (2014) on exchange rates and currency risk premiums; and Dahlquist and Hasseltoft (2016) on international bond risk premiums. In this survey, we emphasize the relationship between currency and bond risk premiums across horizons. Note that multi-horizon effects are not limited to exchange rates only. Binsbergen and Koijen (2017) review multi-horizon patterns in other asset classes.

Appendix A contains a description of the data used in the survey to illustrate our research questions. In particular, it lists the economies corresponding to the G10 currencies and the emerging economies considered here.

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Appendices

A

Data

We collect daily spot and one-month forward exchange rates from Datastream. We follow Chernov *et al.* (2023b) and use several data providers to construct a monthly dataset for the sample period from January 1976 to July 2022. The main results refer to countries for the G10 currencies (with currency codes in parentheses): Australia (AUD), Canada (CAD), Eurozone (EUR) spliced with Germany (DEM) before 1999, Japan (JPY), New Zealand (NZD), Norway (NOK), Sweden (SEK), Switzerland (CHF), United Kingdom (GBP), and the United States (USD). We collect consumer price indexes from the statistical database of the Organisation for Economic Co-operation and Development (OECD). For AUD and NZD, monthly consumer price indexes are not available. We therefore use quarterly indexes for AUD and NZD and forward fill the values in the months until the next quarter.

We complement the exchange rate and consumer price data with monthly G10 zero-coupon curves from Wright (2011) as they become available and up to May 2009. We follow Lustig *et al.* (2019) and update these curves to July 2022 with zero-coupon curve data from Bloomberg.

We also consider a set of emerging market countries (as they are available) from December 1996 to July 2022: Brazil (BRL), Bulgaria

(BGN), Chile (CLP), China (CNY), Colombia (COP), Croatia (HRK), Cyprus (CYP), Czech Republic (CZK), Greece (GRD), Hungary (HUF), Iceland (ISK), India (INR), Indonesia (IDR), Kuwait (KWD), Latvia (LVL), Lithuania (LTL), Mexico (MXN), Philippines (PHP), Poland (PLN), Russia (RUB), Saudi Arabia (SAR), Slovakia (SKK), Slovenia (SIT), South Africa (ZAR), South Korea (KRW), Taiwan (TWD), Thailand (THB), Turkey (TRY), and Ukraine (UAH). The selection is dictated by the availability and quality of the currency forward rate and consumer price index data.

We assume the USD to be the domestic currency. We express all currencies in USD per unit of foreign currency. An increase in the exchange rate implies an appreciation of the foreign currency and a depreciation of the USD.

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