



Forecasting the Brazilian real and the Mexican peso: Asymmetric loss, forecast rationality, and forecaster herding

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ABSTRACT

Using forecasts of exchange rates of the Brazilian real and the Mexican peso against the US dollar, we analyze the symmetry of the loss function of exchange-rate forecasters and the rationality of their forecasts. Symmetry of the loss function can be rejected for some forecasters but not all. Even when allowing for asymmetric loss functions, the predictions of some forecasters do not fit the traditional definition of rational forecasts. We interpret our results in terms of recent research on forecaster (anti-)herding.

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1. Introduction

Beginning with Meese and Rogoff's (1983) demonstration of the lack of explanatory power of exchange-rate models, a substantial body of literature showing the difficulty of forecasting exchange-rate fluctuations by means of structural economic models has developed. This is especially true with regard to the exchange rates of emerging markets. A characteristic feature of the exchange rates of emerging markets is that they exhibit large fluctuations, and often eruptive jumps. Given the poor forecasting performances of structural economic models, survey data of exchange-rate forecasts of professional economists have

been studied widely as an alternative source of information for forecasting exchange rates. However, many researchers have reported that survey data of exchange-rate forecasts violate traditional criteria of forecast rationality (for a survey, see MacDonald, 2000). Traditional forecast rationality criteria require the unbiasedness of forecasts, as well as the orthogonality of forecast errors with respect to a forecaster's information set (Elliott & Ito, 1999; Frankel & Froot, 1987; Frankel & Rose, 1995; Ito, 1990).

Traditional forecast rationality criteria are based on the assumption that forecasters have symmetric (quadratic) loss functions. Patton and Timmermann (2007) argue that invoking the assumption of a symmetric loss function could lead to excess rejections of the hypothesis of rational forecasting if, in fact, forecasters have asymmetric loss functions. Numerous leading econometricians have been arguing for decades that loss functions will not generally be symmetric (Christoffersen & Diebold, 1997; Granger, 1969; Granger & Newbold, 1986; Zellner, 1986, among

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others). Recent research also provides ample evidence that deviations from a symmetric loss function may be quite common (Christodoulakis & Mamatzakis, 2008a; Döpke, Fritsche, & Siliverstovs, 2010; Elliott, Komunjer, & Timmermann, 2005; Sinclair, Joutz, & Stekler, 2010 and Sinclair, Stekler, & Kitzinger, 2010; among others).

However, research on asymmetric loss functions estimated on survey data of exchange-rate forecasts has started only recently. Christodoulakis and Mamatzakis (2008b) study the exchange rates of the G10 countries. While they report evidence in favor of an asymmetric loss function, they derive this finding by using forward exchange rates to measure exchange-rate expectations. In contrast, another recent study by Pierdzioch, Rülke, and Stadtmann (2012a) uses survey data of exchange-rate forecasts that contain information on the yen/dollar exchange-rate forecasts of individual forecasters, while Fritsche, Pierdzioch, Rülke, and Stadtmann (2013) study forecasts of the dollar/euro exchange rate. The results of both of these studies suggest that some forecasters make forecasts under an asymmetric loss function, while others make forecasts under a symmetric loss function. Research on asymmetric loss functions that analyzes the properties of survey data of forecasts of emerging market countries is even rarer. The only paper on the topic that we are aware of is one by Baghesani and Marchon (2012), who analyze an asymmetric loss function using forecasts of the Brazilian real, an important emerging market exchange rate. They use time series analysis to study the forecast mean (that is, the consensus forecast) from a survey conducted by the Brazilian Central Bank. In contrast, the current paper uses a full panel of individual forecasts, thus allowing us to exploit the microeconomic information in the cross-sectional heterogeneity of forecasts.

There are also a few recent microeconomic studies which analyze aspects other than forecast asymmetry for emerging markets. Pierdzioch, Rülke, and Stadtmann (2012b) use forecasts of Asian, European, and South American emerging markets to show that forecasters anti-herd, i.e., they intentionally scatter their forecasts away from the consensus. Hauner, Lee, and Takizawa (2011) study whether exchange rate forecasts from advanced and emerging market economies reflect building blocks of macroeconomic models. Carvalho and Minella (2009) use exchange rate forecasts of financial market participants in Brazil for the time period between 2002 and 2007 to show that the forecasts are not rational, as the forecast errors are correlated with the inflation forecast errors.

Like Christodoulakis and Mamatzakis (2008b), Baghesani and Marchon (2012), and Pierdzioch et al. (2012a), we base our empirical analysis on the approach recently developed by Elliott et al. (2005) for studying the shape of exchange-rate forecasters' loss functions. This approach is easy to implement, provides information about the type of a potential asymmetry in forecasters' loss functions, and allows the rationality of forecasts under an asymmetric loss function to be tested. We use the approach to study survey data of forecasts of the Brazilian real and the Mexican peso vis-à-vis the US dollar over the time period 1995–2009. Our empirical results show that a symmetric loss function seems to fit the forecasts of some

forecasters, but not all. In line with the results reported by Pierdzioch et al. (2012a) and Fritsche et al. (2013), an asymmetric loss function remedies apparent deviations from rationality for some forecasters, but this is not a general feature of the data.

In fact, a major problem for any test of the rational-expectations hypothesis is the so-called joint-hypothesis problem.¹ The joint-hypothesis problem states that any rejection of forecast rationality can stem from either the irrationality of forecasts or a misspecified test. The test procedure that we apply in this paper is also subject to the joint-hypothesis problem. However, using a very simple and flexible asymmetric loss function, our results shed light on the question of whether allowing for asymmetries in forecasters' loss functions helps to weaken the evidence against forecast rationality. Even more importantly, we then proceed to analyze the survey data of exchange-rate forecasts using an alternative approach that was suggested recently by Patton and Timmermann (2007). Their approach is more general than that developed by Elliott et al. (2005) because it does not rest on a specific parametrization of the loss function. The approach only assumes (depending on the details of the data-generating process), under the null hypothesis of forecast rationality, that the loss function either depends only on the forecast error or is homogeneous in the forecast error. In line with our other empirical results, the approach produces insignificant results for some forecasters, but sound rejections of the null hypothesis for other forecasters. Importantly, the approach yields the result that if the exchange rate forecast exceeds (falls short of) the current exchange rate, then the probability that the exchange rate forecast also exceeds (falls short of) the future exchange rate increases.

Against the background of the joint-hypothesis problem, the systematic overshooting and undershooting of forecasts is an important result. The systematic overshooting and undershooting of forecasts plays a key role in recent research on strategic forecasting and forecasters' interactions (Bernhardt, Campello, & Kutsoati, 2006). Ottaviani and Sorensen (2006) show that, in a forecasting contest, forecasters differentiate their forecasts from the projections of their competitors, since there are substantial benefits if such forecasts turn out to be correct. Similarly, Laster, Bennett, and Geoum (1999) argue that the incentive to make extreme forecasts is stronger when the forecast performance is based on forecasters' most recent track record. We argue that our results on forecasters' potentially asymmetric loss functions and the overshooting and undershooting of forecasts can be interpreted in terms of recent research on forecaster anti-herding in foreign exchange markets (Pierdzioch & Stadtmann, 2010; Pierdzioch et al., 2012b). Thus, the rejection of forecast rationality given a potentially asymmetric loss function is consistent with forecast rationality, once we interpret our

¹ Another major problem beleaguering any test of the rational-expectations hypothesis is the fact that any research can only proxy a forecaster's information set. Of course, our empirical research is also subject to this problem.

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