



Growth under exchange rate volatility: Does access to foreign or domestic equity markets matter?

Firat Demir*

Department of Economics, University of Oklahoma, Hester Hall, 729 Elm Avenue, Norman, OK 73019, USA

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ABSTRACT

Employing a firm-level dataset, this paper explores the effects of exchange rate volatility on the growth performances of domestic versus foreign, and publicly traded versus non-traded private manufacturing firms in a major developing country, Turkey. The empirical results using dynamic panel data estimation techniques and comprehensive robustness tests suggest that exchange rate volatility has a significant growth reducing effect on manufacturing firms. However, having access to foreign, and to a lesser degree, domestic equity markets is found to reduce these negative effects at significant levels. These findings continue to hold after controlling for firm heterogeneity due to differences in export orientation, external indebtedness, profitability, productivity, size, industrial characteristics, and time-variant institutional changes.

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1. Introduction

The macro and microeconomic effects of exchange rate volatility have long been a major concern in development economics. The primary purpose of the gold standard of the 19th and early 20th centuries and the ensuing Bretton Woods system, as well as the exchange rate mechanism under the European monetary system of the 1990s was to ensure exchange rate stability. In fact, Article 1 of the Articles of Agreement of the International Monetary Fund (IMF) continues to single out the promotion of “exchange stability” as one of its primary objectives. Nevertheless, increasing financial liberalization and capital market integration after the collapse of the Bretton Woods system in 1973 exposed both developed and developing countries to large swings in exchange rates.

In a majority of empirical studies, increasing exchange rate uncertainty is found to have economically and statistically significant profitability, investment, growth, and to some degree, trade reducing effects (Aghion et al., 2009; Aizenman and Marion, 1999; Baum and Caglayan, 2010; Bleaney and Greenaway, 2001; Caglayan et al., 2013; Pindyck and Solimano, 1993; Ramey and Ramey, 1995). However, research on firm growth effects of exchange rate uncertainty

has been much more limited with an exclusive focus on publicly traded firms located mostly in developed countries despite substantial structural differences between developed and developing countries, and between publicly traded and non-traded firms. The lack of research on developing country experiences is especially surprising given that developing countries face higher levels of exchange rate uncertainty with stronger negative welfare effects than developed countries (Pallage and Robe, 2003). The exclusive focus on publicly traded firms is also striking because of the low market capitalization rates in developing countries that limit sample sizes substantially. Furthermore, there has also been no research exploring differences between domestic and foreign firms in their growth responses to exchange rate uncertainty despite a radical increase in foreign direct investment (FDI) inflows to developing countries, reaching \$690 billion (or 53% of global flows) by 2010 from \$35 billion in 1990 (or 17% of global flows). Furthermore, FDI inflows accounted for 26% of total gross fixed capital formation (GFCF) in developing countries in 2010, almost seven times more than their 1990 level of 4% (UNCTAD, 2012). The increasing participation of foreign firms in production and capital formation in developing countries is expected to have major growth effects given that they are generally found to be more productive and profitable with better access to global and domestic capital markets. As a result they may help mitigate the contractionary effects of exchange rate shocks and currency crises in developing countries. Yet, there has been little empirical

* Tel.: +1 405 325 5844; fax: +1 405 325 5842.

E-mail address: fdemir@ou.edu.

work analyzing the growth effects of exchange rate uncertainty on foreign vis-à-vis domestic firms.

Building on the heterogeneous firm literature, the current study contributes to the existing research on growth effects of exchange rate uncertainty under capital market imperfections by addressing four issues that were previously unaccounted for. First, it separates firms based on their *time-variant* degrees of access to foreign equity. Second, it separates firms based on their access to the domestic stock market. Third, it focuses on a major developing country, Turkey. Fourth, instead of using country or industry level aggregates, it controls for firm heterogeneity based on export orientation, external indebtedness, size, industrial characteristics, and productivity and profitability rates.

The Turkish case is interesting because it entails four important features. First, Turkey liberalized its capital account in 1989, much earlier than other developing countries, and adopted a very open foreign investment regime, leading to substantial FDI inflows since then.¹ Second, as an emerging economy, Turkey has faced high levels of economic instability for the last two decades including significant exchange rate volatility and two severe currency-cum-banking crises in 1994 and 2001. Third, despite comprehensive liberalization programs and a substantial foreign bank presence, the financial sector in Turkey has remained highly underdeveloped. As a result, domestic private firms, both large and small, face strict credit constraints and are forced to finance capital investments mostly from internal sources or short-term borrowing (denominated heavily in foreign currencies), exposing them to exchange rate uncertainty. Looking at the cost of borrowing, for example, the annual average real interest rate reached 11% during 1993–2005, which is the period under consideration in this paper. Likewise, during the same period real private credit (from the banking sector and other financial institutions) to the private sector (as a share of real GDP) was on average a bare 16%.² Money markets in private securities were also quite underdeveloped with the share of private securities in secondary market transactions being below 15% during 1996–2005 (CBRT, 2012). The average stock market capitalization rate as a share of GDP was only 35% during 1995–2001 and 42% during 2002–2011 (World Bank, 2012) compared to the OECD averages of 98% and 147% during the same periods. As a result, it is no surprise that the average share of short-term debt in total debt of top 500 manufacturing firms was found to be 71% during 1993–2005 (and was still around 68% in 2010). Furthermore, as late as 2010 more than 60% (44%) of large (small) firms depended on foreign currency credits for more than 70% of their total borrowing needs (ICI, 2011). On average, non-financial firms accounted for more than 62% of total private external debt during 1993–2005. Fourth, Turkey provides us with a unique firm level panel dataset, which includes 585 private manufacturing firms with over 4800 firm year observations, accounting for 28% of total manufacturing value added during 1993–2005. In addition to balance sheet and income statement information, the dataset includes time series information on the capital structure of each firm such as the level of foreign ownership, domestic equity market access, and the leverage ratios.

The empirical analysis using dynamic panel estimation techniques and comprehensive robustness tests suggest that exchange rate uncertainty has a significantly negative effect on private firm growth. However, having access to foreign capital is found to overcome this negative effect at economically and statistically significant levels. According to point estimates, a one standard deviation increase in exchange rate volatility reduces firm growth by around 4 percentage

points among domestic firms. In contrast, having access to foreign equity either reduces this negative effect by around 40% or, depending on the level of foreign ownership, reverses it fully and leads to an around 3 percentage point increase in growth. Supporting this finding, we also find that firms with access to domestic stock market perform significantly better than non-traded firms under exchange rate shocks. We confirmed these results during currency crises episodes as well. Furthermore, we find that the negative growth effect of exchange rate volatility is significantly lower for firms with higher export orientation and better access to credit markets.

The rest of this paper is organized as follows: the second section provides a brief overview of the literature on uncertainty and growth relationship. The third section introduces the empirical analysis including the data, methodology and estimation issues. The fourth and fifth sections present the empirical results and robustness analysis, and the final section concludes the paper.

2. Literature review

Exchange rate volatility can affect investment and growth through multiple channels. In theory, the sign of the relationship is ambiguous depending on the underlying assumptions (Aiginger, 1987; Caballero and Pindyck, 1996; Dixit and Pindyck, 1994; and the collection of articles in Aizenman and Pinto, 2005). In contrast, a rich body of empirical research points out an unambiguously negative effect of uncertainty on investment, employment, and growth (Aghion et al., 2009; Aizenman and Marion, 1999; Chong and Gradstein, 2009; Federer, 1993; Pindyck and Solimano, 1993; Rosenberg, 2004; Serven, 2003). The previous studies show that exchange rate volatility works its effects through: a) changing the relative costs of production with both creative and destructive growth effects (Burgess and Knetter, 1998; Gourinchas, 1999; Klein et al., 2003); b) reducing the degree of credit availability from the banking system (Bernanke and Gertler, 1990)³ with contractionary effects on employment (Nickell and Nicolitsas, 1999; Sharpe, 1994) and investment (Fazzari et al., 1988); c) decreasing aggregate growth and productivity growth especially in countries where financial development is low (Aghion et al., 2009; Ramey and Ramey, 1995); d) increasing inflation uncertainty, which is found to reduce employment (Seyfried and Ewing, 2001), and growth (Grier and Grier, 2006); e) raising interest rates (UNCTAD, 2006) with negative growth effects (Nickell and Nicolitsas, 1999); f) damaging firm balance sheets and net worth (Bernanke and Gertler, 1990; Braun and Larrain, 2005); and g) discouraging international trade by raising transaction risk (Baum and Caglayan, 2010).

In view of these transmission channels, the growth effects of exchange rate uncertainty will ultimately depend on firm and country characteristics. For example, in the presence of financing constraints firms that have access to domestic and/or foreign capital markets can deal with unexpected exchange rate shocks better than others. Similarly, the level of export orientation, leverage, import dependence, size, productivity, and profitability also determine the nature of firm response to exchange rate shocks (Klein et al., 2003). Regarding country specific factors, Gupta et al. (2007) find that currency crises are more likely to have contractionary effects in emerging markets than in developed or other developing countries. In general, exchange rate uncertainty is expected to have more depressing growth effects in developing countries because of the following vulnerabilities in these markets: a) low levels of financial market deepening and the lack of hedging instruments; b) the presence of original sin and

¹ During 1990–2010, Turkey received \$107 billion FDI inflows, reaching a total FDI stock of \$186 billion in current prices by 2010. Moreover, FDI stock share in GDP reached 25% by 2010, up from 6% in 1990 (UNCTAD, 2012).

² Even during the boom years of 2002–2007, deposit bank private credit to non-financial firms was startlingly low with an average annual growth rate of –5% (CBRT, 2012).

³ Under credit shocks, high share of short term financing (as in developing countries) can also put substantial constraints on firms (Chang and Velasco, 2000). Besides, banking crises in emerging markets are often accompanied by currency crises (Beck et al., 2003).

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