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doi:10.1016/j.worlddev.2009.12.019

Exchange Rate Volatility and Employment Growth in Developing Countries: Evidence from Turkey

FIRAT DEMIR*

University of Oklahoma, Oklahoma, USA

Summary. — Employing a unique panel of 691 private firms that accounted for 26% of total value added in manufacturing in Turkey, the paper explores the impacts of exchange rate volatility on employment growth during the period of 1983–2005. The empirical analysis using a variety of specifications, estimation techniques, and robustness tests suggests that exchange rate volatility has a statistically and economically significant employment growth reducing effect on manufacturing firms. Using point estimates, the results suggest that for an average firm a one standard deviation increase in real exchange rate volatility reduces employment growth in the range of 1.4–2.1 percentage points.

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Key words — exchange rate volatility, employment growth, manufacturing firms, South Eastern Europe, Turkey

1. INTRODUCTION

Increasing capital market integration following the collapse of the Bretton Woods system and the accompanying financial liberalization wave of 1980s and early 1990s exposed both developed and developing countries to large swings in exchange rates. As a result, the effects of exchange rate volatility on investment and growth have increasingly become of particular interest for both researchers and policy makers. In a majority of empirical studies, increasing uncertainty and volatility in exchange rates are found to have economically and statistically significant profitability, investment, growth, and, in some, trade reducing effects in both developed and developing countries (Aizenman & Marion, 1999; Bleaney & Greenaway, 2001; Demir, 2009a, 2009b, 2009c; Kenen & Rodrik, 1986; Pindyck & Solimano, 1993; Ramey & Ramey, 1995; Serven, 1998; Thursby & Thursby, 1987; UNCTAD, 2006). In contrast, the theoretical and empirical research on the employment effects of exchange rate volatility has been much limited with an exclusive focus on developed countries. This lack of research on developing country experiences is especially surprising given that they face higher levels of growth (Mobarak, 2005), consumption (Kose, Prasad, & Terrones, 2003), and capital flow (Gabriele, Boratav, & Parikh, 2000) volatility with significantly costlier welfare effects than developed countries (Pallage & Robe, 2003).

Therefore, the present research expects to fill an important gap in the literature not only by focusing on the direct employment effects of exchange rate volatility in a major emerging market, Turkey, that faced significant levels of economic instability for the last two decades including two-digit real interest rates and high levels of exchange rate and inflation volatility, but also by employing a unique firm level panel dataset. Accordingly, we utilize a comprehensive dataset including firm level data on the largest 500 private manufacturing firms that accounted for the 26% of total value added in manufacturing in Turkey during 1983–2005. The use of three dimensional data including time, firm and industry characteristics not only allows us to explore the direct effects of macro volatility on employment creation at the firm level but also helps uncover more informative and robust results after controlling for firm-level size, value added, and demand effects. Likewise,

the time series dimension of the data permits a detailed analysis of the adjustment process to changes in exchange rate volatility.

Regarding the selection of Turkey, the choice was not random. Briefly, Turkey has not only been among the forerunners of trade and financial liberalization among developing countries starting from early 1980s, but also faced the negative effects of financial liberalization first hand through two major financial crises in 1994 and 2000–01. During this period, the standard deviation of real GDP growth has steadily increased from 3.5 in 1980–89 to 5.2 in 1990–99, and to 6.1 in 2000–05. Moreover, the coefficient of variation of annual real short-term capital inflows has increased three-folds from 1982–89 to 1990–2005.¹ Private firms, on the other hand, have faced strict credit rationing and been forced to finance their investments mostly from internal sources and short-term borrowing. As of 2005, the share of short-term debt in total debt of top 500 manufacturing firms was around 70% that made them more vulnerable to changes in expectations and macro fundamentals. Furthermore, there was little improvement in the industrial and manufacturing sector performance after liberalization. Accordingly, the share of manufacturing value added in GDP stagnated at around 21% during 1982–89 and 1990–2000 before beginning a steady decline, reaching as low as 16% in 2008, which is the lowest level since 1975. In contrast, the export performance of manufacturing sectors has been a textbook example of the wonders of outward oriented export model, reaching 95% of total exports in 2008 from a bare 27% in 1980. Yet, its employment share in total non-agricultural employment stagnated at round 27–28% throughout the 1980s and 1990s and started to decline during the 2000s reaching 25% in 2007. This contrasting transformation also makes it

* I thank Hassan Aly, Güzin Erlat, Jeffrey B. Nugent, Jaime Ros, Mahmut Yasar, session participants at the ASSA 2008 meetings in New Orleans, and at the International Economics Association 2008 meeting in Istanbul, and the three anonymous referees of the journal for their constructive comments and suggestions. For financial support, I would like to thank the Office of the Vice President for Research, the Research Council, and the College of Arts and Sciences at the University of Oklahoma. The usual disclaimer applies. Final revision accepted: January 4, 2010.

an interesting case study to explore the effects of exchange rate volatility on manufacturing sector employment performance.

The empirical results using a fixed effects (and a dynamic GMM) method and various specifications and robustness tests suggest that exchange rate volatility has a statistically (at less than 1% level) and economically significant employment growth reducing effect on manufacturing firms in Turkey. In terms of economic impact, our point estimates suggest that for an average firm a one standard deviation increase in real exchange rate (RER) volatility reduces employment growth in the range of 1.4–2.1 percentage points that is a considerable magnitude given that the average employment growth has been 1.7% among the sample firms during the period analyzed.

The paper is organized as follows: Section 2 provides a brief overview of the literature on the volatility and employment relationship. Section 3 introduces the key hypothesis together with data, methodology and estimation issues. Sections 4 and 5 present the empirical results and robustness tests, and Section 6 concludes the paper.

2. LITERATURE REVIEW

Exchange rate volatility can affect investment and employment decisions of firms through multiple channels though, theoretically speaking, the sign of the relationship is ambiguous. The theoretical research on the sign of investment-uncertainty relationship gives opposing results depending on assumptions regarding production technology and irreversibility problem (for a discussion see Aiginger, 1987; Caballero & Pindyck, 1996; Dixit & Pindyck, 1994; and the collection of articles in Aizenman & Pinto, 2005). In contrast, the overwhelming majority of empirical research suggests an unambiguously direct and negative link from uncertainty and volatility to investment. First, increasing volatility can reduce the total supply of credits available from the banking system (Bernanke & Gertler, 1990). The empirical evidence shows that in markets with capital market imperfections, financial constraints significantly affect firm level fluctuations in employment (Sharpe, 1994), inventories (Kashyap, Lamont, & Stein, 1994), investment (Fazzari, Hubbard, & Petersen, 1998), sales, and short-term borrowing (Bernanke, Gertler, & Gilchrist, 1996; Gertler & Gilchrist, 1994). In addition, Braun and Larrain (2005) show that the negative effect of recessions on industrial growth is increasing with the degree of external finance dependence and financial frictions. Second, increasing exchange rate volatility causes higher interest rates through rising risk premium, and more restrictive monetary policy, both to continue attracting capital inflows (in the presence of current account deficits) and to fight against inflation (UNCTAD, 2006). Consequently, increasing interest costs negatively affect employment (Nickell & Nicolitsas, 1999).

In addition, exchange rate volatility can directly affect firms' employment decisions through its effects on sales, profits, and investment risk and planning (Aizenman & Marion, 1999; Demir, 2009a, 2009b, 2009c; Federer, 1993; Pindyck & Solimano, 1993). It can also: (a) raise inflation uncertainty (UNCTAD, 2006) that is shown to reduce employment (Seyfried & Ewing, 2001) and growth (Grier & Grier, 2006); (b) encourage short-term financial investments at the expense of long term fixed investments by real sector firms (Demir, 2009a, 2009b; UNCTAD, 2006); (c) damage firms' balance sheets and reduce their net worth (especially when firms suffer from currency and maturity mismatch problems) that limit the amount of credit they can get, aggravating the initial shock (Bernanke & Gertler, 1990; Braun & Larrain, 2005; Krugman, 1999); (d) reduce

economic growth with negative effects on employment (Pindyck & Solimano, 1993; Ramey & Ramey, 1995); (e) discourage international trade (assuming risk-averse investors) by raising the risk in international transactions (Kenen & Rodrik, 1986; Qian & Varangis, 1994; Thursby & Thursby, 1987). The negative effect is expected to be more pronounced when the exports are invoiced in the importers' currency, as is the case for most developing countries (Qian & Varangis, 1994; also see Grier & Smallwood, 2007). Thus, both export oriented and imported input dependent firms would be expected to suffer more from exchange rate uncertainty. There might also be additional transmission channels such as the contemporaneous effect of exchange rate uncertainty on employment through higher wages. Accordingly, uncertainty in labor demand (caused by exchange rate uncertainty) may cause unions to add a risk premium to their wage demands and lead to higher unemployment (Andersen & Sorensen, 1988; Belke & Kaas, 2004). In a parallel strain of this literature, Belke and Gocke (2004) also formalize the employment decisions of a risk-neutral firm in the presence of sunk hiring and firing costs, and revenue uncertainty resulting from exchange rate volatility (in which case the effect of uncertainty becomes indeterminate depending on the history of the system).

In all above cases, the extent to which the employment decisions of firms are subject to the irreversibility problem is conditional on the degree of labor market flexibility. Firms may respond to increasing uncertainty and volatility by cutting employment, labor hours or wages depending on the nature of the shock, cost of firing/hiring and other labor market rigidities, and the contract structure of labor force (Belke & Setzer, 2003; Campa & Goldberg, 2001; Hammermesh, 1993).² They may also start increasing the use of subcontractors for activities that they used to perform themselves.

Nevertheless, most empirical work on the employment effects of macroeconomic volatility only focuses on developed country markets. In these studies, employment fluctuations are found to be significantly related to RER movements and volatility in high income OECD and the European Union countries (Belke & Gros, 2002; Belke & Setzer, 2003; Burgess & Knetter, 1998; Campa & Goldberg, 2001; Goldberg, Tracy, & Aaronson, 1999; Gourinchas, 1998, 1999; Klein, Schuh, & Triest, 2003). In contrast, there is limited research on the employment effects of RER volatility in developing countries. Regarding fluctuations in levels, Frenkel and Ros (2006) find a significantly negative effect of real exchange rate appreciations on employment growth in 17 Latin American countries. Likewise, Ribero *et al.* (2004) find a significantly negative effect of RER appreciation on employment creation in manufacturing sectors in Brazil. Furthermore, Galindo, Izquierdo, and Montero (2006) show that RER depreciations have negative employment effects in industries with high liability dollarization. None of these studies, however, focus directly on the employment effects of exchange rate *volatility* in developing countries.

The lack of research is surprising given that exchange rate volatility is expected to have more depressing employment effects in developing countries because of: (a) low levels of financial market development and high share of short-term liabilities, (b) lack of developed futures markets and other hedging instruments,³ (c) the presence of original sin and dollarization that makes firms' balance sheets (including external indebtedness and valuation) more exposed to changes in exchange rates, (d) higher levels of openness in these markets, and invoicing of exports in major foreign currencies, (e) higher levels of exchange rate pass-through, (f) higher exchange rate and inflation uncertainty, and higher country risk, (g) more

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