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Regional vulnerability: The case of East Asia

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Abstract

In a case study of six East Asian economies, we use dynamic factor analysis to estimate a regional component of the exchange market pressure index (EMPI) as a measure of regional financial stress. The extent to which this indicator is explained by regional economic and financial factors is interpreted as regional vulnerability to crisis. We find that regional external liabilities and exuberance in domestic stock and credit markets, as well as the US high-yield spread, were positively correlated with regional vulnerability. Individual country EMPIs are also explained by regional factors, with country-specific factors and trade linkages playing little role.

JEL classification: F31; F32; F36

Keywords: Currency crisis; Contagion; Vulnerability; Dynamic factor analysis

1. Introduction

The financial crises of the 1990s differed from those of the 1970s in a fundamental way: they tended to strike several countries simultaneously. The domino collapse of the European Exchange Rate Mechanism in 1992–1993, the "Tequila effect" of the Mexican crisis in 1994, the "Asian flu" of 1997–1998 and the turmoil in emerging and global financial markets following the August 1998 Russian crisis all illustrate the coincidence of financial crises in the

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last decade of the twentieth century. Such coincidence of crises has brought to the fore a vigorous enquiry into the extent and reasons for interconnections between economies.

The starting point of the analysis in this paper is the observation that crises have tended to be regional. While the events surrounding the Russian crisis in 1998 reverberated throughout the world, the evidence is persuasive that countries within a geographical region are jointly vulnerable (Glick and Rose, 1999; Eichengreen et al., 2001).

In this paper, we suggest a method of determining the degree of common susceptibility or vulnerability to crisis that may characterize a region, using six Asian economies and their behavior before, during and after the East Asian crisis of the late 1990s as a case study.[1] In particular, we pursue the idea that a region such as East Asia largely presents a common "prospectus" to international investors. This may be because countries within a region follow similar development strategies and economic policies (Rigobon, 1998). Combined with investors' need to economize on information gathering, as implied by models such as those presented by Calvo and Mendoza (2000), groups of countries in a particular region may come to represent a single corporate entity, e.g., "East Asia, Inc."

Our research may be viewed in a broad sense as a contribution to the literature on contagion. We prefer, however, to use the term "vulnerability" for two reasons. First, as noted by Dungey and Tambakis (2003), the term "contagion" has proved to be something of an elusive concept, with no single received usage (see e.g. Masson, 1999; Edwards, 2000; Kaminsky and Reinhart, 2000; Forbes and Rigobon, 2001; Corsetti et al., 2002). More importantly, however, we see vulnerability and contagion as two components that together form an index of common regional exchange market stress. The component that is explained by movements in regional macroeconomic and financial variables we term *vulnerability*. The component that is unexpected, based on the explanatory regional variables, could be thought of as *contagion*, following, for example, Masson (1999) and Edwards (2000). Vulnerability and contagion are thus related and, indeed, contagion may occur because of non-linear effects or structural shifts when vulnerability levels reach certain thresholds (Jeanne, 1997; Masson, 1999).

The remainder of the paper is structured as follows. In Section 2 we discuss the dynamic factor analysis that we use to construct a regional stress index. Section 3 presents the empirical results of our case study, reporting both the determinants of regional vulnerability and those of country-specific EMPIs. A brief summary of the case study findings and the implications for policy and future research are presented in a final section.

2. Methodological issues

The construction of our measure of regional vulnerability proceeds in three steps. First we construct an index to capture the idea of devaluation probability and financial stress for each country, using the well-known exchange market pressure index (EMPI). Second, we employ dynamic factor analysis in order to extract the component of the EMPI that is common to all six countries under examination in our case study, which can therefore be treated as a measure

[1] Choosing these countries as representative of the region of East Asia immediately raises fundamental issues as to what constitutes a region. For example, if this were defined purely geographically, then our analysis ought to include other countries such as Vietnam, Cambodia, Hong Kong, etc. To include *all* countries in the geographical region would, however, lead to difficulties in empirical work because it would involve the estimation of very large dynamic systems. Hence, we have restricted ourselves to an examination of just six countries, but acknowledge that our research therefore can only be interpreted as a case study of those countries.