



The sources of contagion risk in a banking sector with foreign ownership



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ABSTRACT

Foreign-dominated banking sectors, such as those prevalent in Central and Eastern Europe, are susceptible to two major sources of systemic risk: (i) linkages between local banks and (ii) linkages between a foreign parent bank and its local subsidiary. During and after the global financial crisis, the second source of risk has been stressed by local regulators. Using a nonparametric method based on extreme value theory, we analyze interdependencies in downward risk in the banking sectors of the Czech Republic, Poland, Slovakia, and Turkey during 1994–2013. We find that the risk of contagion from a foreign parent bank to its local subsidiary is substantially smaller than the risk between two local banks.

1. Introduction

In many emerging markets, especially in Central and Eastern Europe, a significant proportion of banks are owned by foreign multi-bank holdings. Until the global financial crisis of the late 2000s, the high level of foreign presence in the banking sectors of these countries was mostly viewed favorably: foreign owners were thought to reduce the inefficiency of local banks, which had often been state-owned in the past. These expectations were corroborated by researchers examining the drivers of bank efficiency in Central and Eastern Europe, who showed that foreign-owned banks outperformed other local banks (for example, Bonin et al., 2005; Brissimis et al., 2008; Hasan and Marton, 2003; Berger et al., 2009).¹ Using a sample of ten CEE countries, Dinger (2009) finds stabilizing effect of foreign-owned banks on emerging economies. Deng et al. (2007) highlight the positive effects of geographic diversification. The positive view changed when the financial crisis spread from developed to emerging markets, and regulators started to worry that parent banks would drain liquidity from their local subsidiaries and began to consider foreign ownership as a potential source of risk (see, for instance, CNB, 2012; NBP, 2011).

In contrast to the change in the perception of foreign ownership of local banks, the research literature traditionally focuses on the positive effects of the ownership of local banks by multi-bank holdings. For example, Ashcraft (2004) argues that banks affiliated with multi-bank holdings are safer than stand-alone banks, because the affiliated banks can receive capital injections in bad times and are thus able to recover more quickly. De Haas and Van Lelyveld (2010) suggest that foreign ownership of banks can have counter-cyclical effects, since affiliates of foreign banks do not have to reduce credit supply in times of financial crisis idiosyncratic to the domestic economy. Goldberg et al. (2000) conclude that foreign ownership of banks in Argentina and Mexico contributed to greater stability of the financial system during crises in emerging markets.

In this paper we focus on the threat of contagion from foreign owners to local banks in Central and Eastern Europe (the Czech Republic, Poland, Slovakia, and Turkey).² Our goal is to compare these risks with those stemming from systemic interdependencies among individual banks in the local market. We investigate these issues using stock market data and the methodology of Slijkerman et al. (2013), which we adjust so that it can be employed to examine the relationship

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¹ Further positive effects of foreign ownership have been documented by Berger et al. (2010), who show that an affiliation with a foreign company comes with smaller diseconomies from diversification. Fang et al. (2011) find that reform of creditor rights leads to higher financial stability.

² Some of these countries are now considered *advanced* by many observers, but all were classified as *emerging* for most of the time period we examine, so we stick to the latter classification.

between a foreign parent bank and a domestic subsidiary or the relationship between banks in the domestic market. This non-parametric method builds on extreme value theory and accounts for fat-tailed distributed shocks, which are a characteristic feature of financial markets.

We find that the threat of contagion between local banks and their foreign owners is much weaker than the risk between the local banks themselves. The estimated probability that a local bank fails after a failure of another bank in the local market is 10%, while the probability of default of a bank is only 5% if the bank's foreign owner crashes. Therefore, our results suggest that foreign ownership does not substantially add to systemic risk in the local banking sector.

The contribution of our analysis in comparison with previous research is threefold. First, our paper is the first to focus on the relationship between foreign parent banks and their local subsidiaries and compare the risks of contagion from ailing parents to healthy daughters with the relationships between individual banks in the local market. Second, few studies have analyzed systemic risk in Central and Eastern Europe (the rare examples include, for instance, [Arvai et al., 2009](#)). Third, we employ modern techniques well-suited to the examination of interdependencies in downside risk between banks ([Slijkerman et al., 2013](#)).

Our results also point to much weaker co-movement of extreme losses in stock prices between a local bank and its foreign owner than between local banks. This finding seems to contrast with a relatively large literature on stock market co-movements in Central and Eastern Europe. For example, [Horvath and Petrovski \(2013\)](#) conclude that stock markets in the Czech Republic, Hungary, and Poland are heavily correlated with those in Western Europe. [Gjika and Horvath \(2013\)](#) report a high level of market integration between the Czech Republic, Hungary, and Poland and the euro area. The analysis of [Syllignakis and Kouretas \(2011\)](#) shows similar results. Our findings are different because we use a more flexible, non-parametric method that focuses on large outlying shocks in financial markets. This method captures extreme dependence and allows for heavy tails. Thus, we measure effects the previous studies did not capture.

The remainder of the paper is organized as follows: [Section 2](#) discusses related literature, [Section 3](#) provides the economic rationale of our analysis, [Section 4](#) explains the model based on extreme value theory, [Section 5](#) describes estimation methods and data, and [Section 6](#) discusses the results. [Section 7](#) concludes the paper. [Appendix A](#) shows the acronyms of the bank names used in the paper, [Appendix B](#) provides additional simulation results, [Appendix C](#) contains several robustness checks, and [Appendix D](#) provides confidence intervals around our central estimates.

2. Related literature

In this section we present an overview of the recent literature on systemic risk. Our paper is unique in three aspects. First, due to its focus on the relationship between a domestic subsidiary and its foreign parent; second, due to its focus on Central and Eastern European countries; and third, due to its techniques that examine tail dependence in returns.

The existing literature acknowledges the positive effects of the relationship between a parent bank and its local subsidiary. Based on US data, [Ashcraft \(2004\)](#) finds that banks affiliated with a multi-bank holding company tend to be substantially safer than either stand-alone banks or banks owned by a one-bank holding company, because affiliated banks can be expected to receive capital injections when needed and thus recover more quickly from negative shocks than other banks. Using simulation techniques, [Klein and Saldenberg \(1997\)](#) conclude that diversification within the holding-company structure enables higher efficiency, i.e., holding less capital and doing more lending compared with the benchmark. [Deng et al. \(2007\)](#) highlight the positive effects of geographic diversification of deposits and diversifica-

tion of assets. [De Haas and Van Lelyveld \(2010\)](#) find positive effects of a strong parent on the expansion of subsidiaries. Moreover, due to the support of the parent bank, foreign bank subsidiaries also do not need to limit credit supply during periods of financial crises, in contrast to domestic banks, which suggests counter-cyclical effects on the domestic economy. Nevertheless, these authors do not discuss what happens if the parent bank is affected by a negative shock.

The potential downsides are less pronounced in the literature. Only [Keeton \(1990\)](#) discusses three situations which result in adverse effects. First, the parent may decide to let its subsidiary fail if the expected earnings are lower than the cost of saving the bank. Second, the parent company may transfer the resources from a troubled subsidiary in mispriced transactions. Third, a low capitalized parent may force its healthy subsidiaries to take big risks in order to earn enough to pay for the parent's debt. Nevertheless, [Keeton's \(1990\)](#) paper is based on the US reality in the 1980s, which is remote from the situation in the Central and Eastern European countries at the current juncture.

Regarding the effects of foreign ownership, the results reported in the literature are mostly positive. [Goldberg et al. \(2000\)](#) conclude that foreign ownership of banks in Argentina and Mexico had contributed to a greater stability during a crisis. On the other hand, [Lensink et al. \(2008\)](#) find that foreign ownership negatively affects bank efficiency. Nevertheless, they agree that inefficiency is reduced in the presence of sound institutions. Specifically in the case of CEE, [Bonin et al. \(2005\)](#) conclude that majority foreign ownership leads to higher operating efficiency. Using a sample of ten CEE countries, [Dinger \(2009\)](#) finds a stabilizing effect of foreign-owned banks on emerging economies. [Brissimis et al. \(2008\)](#) ascertain significantly positive effects of foreign ownership on the productive efficiency of banks in the so-called new EU member states. Focusing only on Hungary, [Hasan and Marton \(2003\)](#) show that foreign banks and banks with higher foreign bank ownership involvement tend to be associated with lower inefficiency. Examining data from Hungary, [Ábel and Siklos \(2004\)](#) argue that the policy of searching for foreign strategic partners to take over existing domestic banks has created a stable and well-functioning banking sector. Thus, it seems that foreign bank ownership yields positive effects on efficiency at least in the CEE countries, which are relevant for this study.

There exist only a few studies that focus on the systemic risk of banks in the CEE. Nevertheless, the existing studies are conceptually different from our study. The closest paper is that of [Arvai et al. \(2009\)](#), who, employing BIS country-level data, study the exposures between Western European and Central, Eastern & South-Eastern European (CESE) countries. They conclude that the financial interlinkages with Europe are economically significant and that most CESE countries are dependent on banks in Austria, Germany, and Italy, stating that the exposures are quite concentrated. The exposure in the opposite direction is said to be much smaller. Focusing only on the Czech Republic, [Cihak et al. \(2007\)](#) conclude that the Czech banking sector is relatively resilient to the aforementioned shocks. These results suggest there is a downside from a high exposure to Western Europe, although some countries may show more resiliency than others.

A comparatively larger literature is devoted to stock market comovements. Focusing only on stock indices of banks in the Czech Republic, Hungary, and Poland, [Jokipii and Lucey \(2007\)](#) find a presence of considerable comovement. Examining the whole stock markets, [Horvath and Petrovski \(2013\)](#) conclude that stock markets in the Czech Republic, Hungary, and Poland are heavily correlated with those in Western Europe. In another study, [Gjika and Horvath \(2013\)](#) find a high level of market integration between the three countries and the euro area. The analysis of [Syllignakis and Kouretas \(2011\)](#), which also involves Slovakia, shows similar results. Should the comovements exist also in the tails of return distributions of banks, in terms of our technique, it would hint at a higher level of systemic risk.

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