

Comment on: “The Growth of Multinational Firms in the Great Recession”

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This paper begins with the observation that the foreign affiliates of multinational firms, in the aggregate, fared worse than the domestic firms located in the same country during the last recession. In the authors’ data, foreign affiliates grew about one percent faster than domestic firms during 2004–2008 and 2009–2012, but grew two percent slower than domestic firms during 2008–2009.

Digging into the firm-level data, the authors make a convincing case that, while the average foreign affiliate grew slower than the average domestic firm during the recession, this difference largely disappears after controlling for firm-level characteristics, the most important of which is firm size.<sup>1</sup> There does not seem to be anything special about the multinational aspect of these affiliates.

In regards to the firm-level measurement, two issues arise. First, the growth rate calculations consider only firms that are present in the data at both the beginning and the end of the period. If multinational firms are less likely to exit the data compared to domestic firms (multinationals tend to be larger and older), this will bias the growth rate of multinational firms downward. The nature of the data make controlling for this selection difficult.

Second, measuring the output of a multinational firm, in and of itself, can be problematic. Transfer pricing can skew the value of an affiliate’s output, particularly for firms in production sharing relationships. Special purpose entities — e.g., holding companies, licensing companies, and securitization vehicles — may also create problems.<sup>2</sup> These special purpose entities are most prevalent in countries that are highly dependent on multinational investment, such as Ireland, the Netherlands, and Singapore. As a check, the authors could compute employment growth rates, which may be more robust to these measurement issues.

The remainder of the paper documents a source-country component in the performance of multinational foreign affiliates. The variance in this source-country component, together with the relative importance of affiliates from different source countries, can have a significant impact on the aggregate outcomes in the host countries. I will focus my remaining comments on these source-country effects.

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<sup>1</sup>Since multinational firms tend to be larger than their domestic counterparts, it follows that larger firms fared worse in this recession than smaller firms. Whether smaller or larger firms fare better during recessions appears to be an unsettled debate in the literature (see, for example, “[How Firms Respond to Business Cycles: The Role of Firm Age and Firm Size](#)”). Many of these studies are confined to a single country’s data. There may be scope for the authors to pursue this topic from a cross-country perspective in separate work.

<sup>2</sup>See Lipsey (“[Measuring the Location of Production in a World of Intangible Productive Assets, FDI, and Intrafirm Trade](#)”) and Rassier (“[Characteristics of Special Purpose Entities in Measures of U.S. Direct Investment Abroad](#)”) for measurement issues regarding special purpose entities.

# 1 An alternative decomposition

The authors show that the heterogeneity in foreign affiliate outcomes by source country can have substantial effects on the host country's aggregate outcomes. To do so, the authors derive a counterfactual growth rate in host country  $n$  as

$$\gamma_{n,2009}^{counter} - \gamma_{n,2009} = \sum_{i \neq n} \omega_{in,2008} [\hat{\beta}_{i,pc} - \hat{\beta}_{i,c}], \quad (1)$$

where  $\beta_{i,pc}$  is the pre-crisis growth rate coefficient and  $\beta_{i,c}$  is the crisis-period growth rate coefficient estimated from the authors' equation 2. The share of country  $n$ 's output produced by multinationals from country  $i$  is  $\omega_{in}$ . This equation calculates the difference in the aggregate growth rate during the recession that the host country would have experienced if foreign affiliates in country  $n$  had grown at their pre-crisis rates.

To evaluate the importance of source-country heterogeneity, the authors recompute (1) after replacing the source-country growth rate coefficients ( $\hat{\beta}_{i,pc} - \hat{\beta}_{i,c}$ ) with pooled coefficients ( $\hat{\beta}_{pc} - \hat{\beta}_c$ ) that do not vary by source country. The differences between this measure and the source-country specific measure are informative about a host country's exposure to multinational fluctuations that vary systematically by source country. Lithuania, for example, would have grown much faster if all of the multinationals in the country had grown at the pooled rate, rather than the source-country specific rates. Poland and Sweden were important sources of foreign affiliates in Lithuania, and affiliates from these two countries performed poorly.

The importance of source-country shocks depends upon the covariance of the shares of source country  $i$  in country  $n$ 's production and the performance of foreign affiliates from  $i$ . To further explore this idea, rewrite the right-hand-side of (1) using the covariance definition to yield

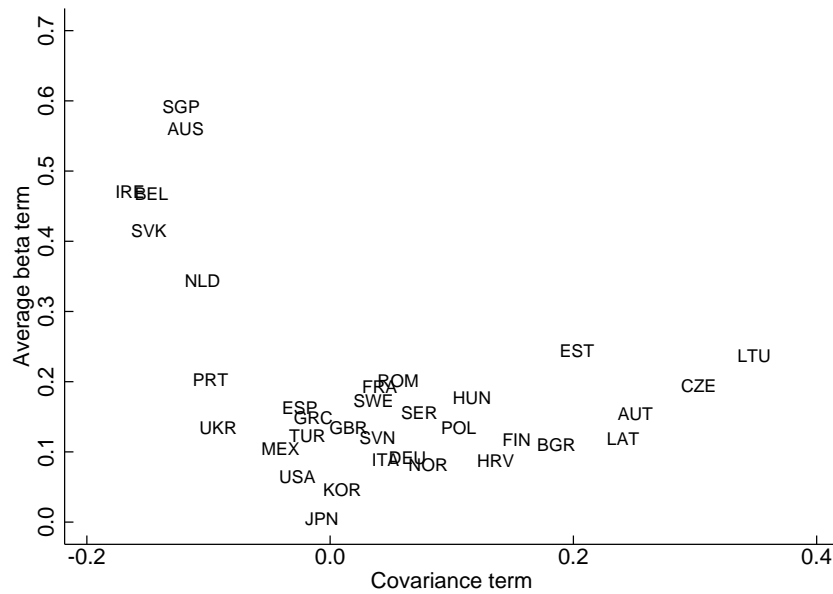
$$\gamma_{n,2009}^{counter} - \gamma_{n,2009} = n \times \text{cov}(\omega_{in,t-1}, \hat{\beta}_{i,pc} - \hat{\beta}_{i,c}) + E [\hat{\beta}_{i,pc} - \hat{\beta}_{i,c}] \sum_{i \neq n} \omega_{in,2008}. \quad (2)$$

The second term on the right-hand side of (2) — the *average beta term* — is the average difference in the growth rate coefficients weighted by the share of multinationals in country  $n$ 's output. This term captures how much better country  $n$  would have fared if every multinational located in  $n$  behaved like the average multinational located in  $n$ . This term is conceptually similar to the pooled growth rate coefficient estimated by the authors.

The first term on the right-hand side of (2) is the covariance between the share of multinationals from source country  $i$  and the relative performance of multinationals from country  $i$  — the *covariance term*. If this term is positive, country  $n$  has more output produced by multinationals from countries that performed relatively poorly during the recession. This term captures the ways that the composition of a country's affiliates affects aggregate output growth.

In Figure 1, I plot the average beta terms and the covariance terms for the countries in the sample. I use the authors' estimates of the growth rate coefficients from the specification that

Figure 1: Average beta term versus covariance term.



controls for destination, sector, time, and size quartile. The average beta term for most countries falls between 0.05 and 0.25. Countries largely host multinationals from a similar group of source countries, so countries with large average beta terms (e.g., Singapore and Australia) have larger than average total shares of their output produced by multinationals.<sup>3</sup> The covariance term also varies across countries, with Lithuania’s multinational composition helping the least and Ireland’s multinational composition helping the most.

In Table 1, I report the three terms in (2) for a few countries. I also report the results from (1), but using the pooled growth rate coefficients rather than the source-country specific growth rate coefficients — these are the authors’ non-source-specific counterfactuals in their Table 6. Notice that the average beta terms that I compute are similar to the non-source-specific counterfactuals computed by the authors. There are exceptions, but the differences tend to be small. The correlation coefficient between my average beta terms and the authors’ counterfactuals is 0.87. This implies that the covariance terms in my decomposition will explain most of the differences between the source-specific and non-source-specific counterfactuals in the authors’ Table 6.

In Ireland, output growth was 0.31 percentage points lower than it would have been if multinationals in Ireland had grown during the recession as they had before the recession. If each multinational in Ireland had behaved like the average multinational in Ireland, growth would have been even worse: 0.47 percentage points lower. These two numbers differ because Ireland has relatively more multinationals from countries whose multinationals did relatively well: the covariance term is  $-0.16$ . This covariance is greatly influenced by multinationals from the United Kingdom and the United States (Figure 2a).

<sup>3</sup>The coefficient of variation of  $E(\hat{\beta}_{i,pc} - \hat{\beta}_{i,c})$  is 0.34. The coefficient of variation of the average beta term is 0.74.

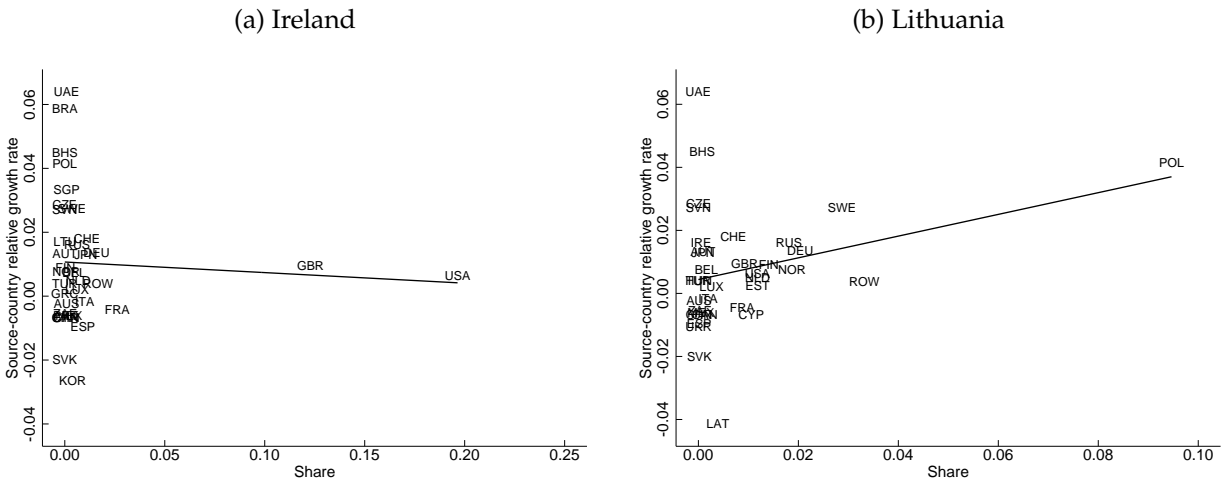
Table 1: Counterfactual growth rate decomposition.

	$\gamma_{n,09}^{counter} - \gamma_{n,09}$	Cov. term	Avg. beta term	$(\hat{\beta}_{pc} - \hat{\beta}_c) \sum_{i \neq n} \omega_{in,08}$
Ireland	0.31	-0.16	0.47	0.31
Lithuania	0.59	0.34	0.24	0.22
Spain	0.14	-0.02	0.16	0.16

Notes: The first three columns report the three terms in (2). The fourth column reports (1), but using the pooled growth rate coefficients (controlling for destination, sector, size quartile, and year) rather than the source-country specific growth rate coefficients.

In Lithuania, the situation is reversed: output growth was 0.59 percentage points lower than it would have been if multinationals in Lithuania had grown during the recession as they had before the recession, but its average beta term is only 0.24 percentage points. Most of Lithuania’s multinationals are from source countries whose multinationals did relatively poorly: the covariance term is 0.34. In this case, the covariance is driven by multinationals from Poland (Figure 2b).

Figure 2: Source-country relative growth rates versus shares.



Notes: These figures plot the source-country relative growth rate ( $\hat{\beta}_{i,pc} - \hat{\beta}_{i,c}$ ) against the 2008 share of multinationals in total production. The source-country relative growth rate estimates are from the specification that controls for destination, sector, size quartile, and year.

## 2 What are source-country shocks?

The analysis suggests that, while multinationals did not fare much better or worse than domestic firms during the recession, multinational performance during the recession seems to systematically vary by the multinational’s country of origin. This idea is captured in the model presented by the authors as a source-country “shock” to multinational performance. What are the economic mechanisms that might give rise to source-country shocks?

What factors might be common to multinational firms that are headquartered in the same country? The authors show that the source-country effects they estimate are related to the growth of domestic firms in the source country (their Figure 9), suggesting that domestic conditions are

being passed along to their multinational foreign affiliates. This may be evidence of transmission through production sharing. If a foreign affiliate is part of a vertically integrated multinational firm, the demand for that foreign affiliate's output is likely to be correlated with the demand in the source country.<sup>4</sup>

Another source of transmission might be credit conditions in the source country. The foreign affiliates of multinational companies often rely on internal capital markets rather than host country capital markets. This feature, which is often cited as a benefit to the foreign affiliate, may also provide a channel through which source-country conditions can affect foreign operations. In a similar vein, multinational firms from the same source country may be exposed to common exchange rate movements or issues regarding the currency composition of their debt. To the extent that financial factors are related to output growth, the relationship between source-country growth and the source-country effects suggests that these channels may be plausible.

The analysis presented by the authors shows that the source of a country's multinational firms can be an important determinant in domestic output. Further research is needed to understand the channels through which this occurs.

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<sup>4</sup>Ramondo, Rappoport, and Ruhl ("[Intrafirm Trade and Vertical Fragmentation in U.S. Multinational Corporations](#)") show that the majority of manufacturing affiliates of U.S. manufacturing parents do not ship goods within the firm, although, those that do ship intrafirm tend to be large.