A novel stock return index can help portfolio managers make more informed investment decisions and better manage risks.

The rapid pace of globalisation in the past 20 years has blurred geographic boundaries in many aspects, including investing. When an asset manager picks a company, they are really investing in a basket of countries, since the firm is more likely than not operating across multiple countries. Known as geographic investing, this type of investment necessarily requires asset managers to study the composition of the basket and the risks associated with each country before making investment decisions.

One of the tools at their disposal is country-level stock market indices. However, traditional indices such as Japan’s Nikkei and Germany’s DAX, or those compiled by global providers including MSCI, FTSE and S&P, comprise only stocks issued by firms domiciled in the country. Foreign firms are excluded even if they derive a substantial proportion of their revenue in said country. These indices are therefore poor gauges of countries’ economic risks in the age of globalisation. Asset managers may very well invest in a firm that is domiciled in one country but makes most of its money in other
countries – while overlooking foreign firms headquartered elsewhere that conduct substantial business in the country.

To help portfolio managers track geographic risks much more accurately and make more informed investment decisions, my co-authors* and I developed indices using a statistical technique called expectation-maximisation (EM). As we show in this paper published in the Financial Analysts Journal, compared to traditional indices, our EM indices are more representative of the distinct business risks of each country as well as the relative importance of multinationals. They thus do a much better job of capturing a firm’s operational risks as a function of its exposure to various countries.

**Globalisation’s imprint**

Here’s how we built our EM index: From the World’Vest Base database, which transcribes annual report information for some 50,000 active listed firms worldwide, we culled data on the revenue of firms’ whose stock returns were available in the Datastream database. Our final sample covered 1999 through 2014 and factored in the risks involved when investing in 12 countries: Australia, Brazil, Canada, China, France, Germany, Japan, India, Malaysia, Singapore, the United Kingdom and the United States.

Except for Japan, all the countries saw a marked decline in the percentage of locally domiciled firms selling in the domestic market. In the US, for example, it went from 73.3 percent in 2000 to 61.1 percent in 2014; in France, from 52 percent to 36 percent; and in Germany, a dramatic fall from 60.5 percent to 24.6 percent.

Using the data collected, we constructed three indices: a national “ISIN” domicile-based index; a domestic index which we call the “70-percent index”; and the EM index. The 70-percent index is a middle-of-the-road approach that other researchers have advocated. It consists of firms that derive 70 percent or more of their revenues from one country (almost always the country where the firm is domiciled). This index is therefore presumably more representative than traditional national ones even though, like the latter, it disregards foreign companies as well as domestic firms’ foreign revenues.

The EM index, in contrast, consists of the stock returns of three types of companies: “domestic” firms; MNCs that sell to the country but also bring with them the influence of stock returns linked to other countries; and MNCs
that may not sell anything to the country but serve to offset the unrelated returns linked to the previous group of MNCs.

Take the 20 German firms with the highest percentage of foreign relative to domestic revenues during our sample period, such as Daimler-Benz, SAP and Adidas. In 2014, these 20 firms accounted for 14.95 percent of the EM index for Germany, 2.53 percent of the index for France and 3.93 percent for the UK -- but are conspicuously absent from the national and domestic indices for France and the UK.

**How EM indices ace the test**

Comparing the volatility and correlations of the three indices across our sample timeframe and countries, we found the following:

1. *EM is more distinctive than traditional indices*

   Our novel EM approach is markedly less correlated to either the national ISIN or the domestic 70-percent indices than the latter two are to each other. This suggests that the EM index is more indicative of the distinct risks of each country.

2. *EM is less volatile than traditional indices*

   We surmised that this is due to our sample being dominated by developed countries. Some of the volatility of the national and domestic indices of these countries could stem from the operations of MNCs – which tend to be headquartered in developed countries – in emerging countries. Our EM method, on the other hand, removes the influence of MNCs’ operations in foreign markets during the statistical analysis.

3. *EM is less linked across countries*

   EM indices are less correlated across countries compared to national or domestic indices, presumably due in part to the huge overlap of MNCs from different countries selling in the same foreign markets such as China and Mexico. Again, this suggests that the EM index is more representative of each country’s risks.

   Further, the more a country is penetrated by foreign firms, the bigger the difference between its EM and domestic indices, which only imperfectly capture the influence of domestic versus foreign business activities. For
example, the correlation between the EM and 70-percent indices is lower for Canada (0.899) than India (0.968).

4. **EM is better at capturing business risks**

Firms’ stocks are more sensitive to foreign EM indices than those of their country of domicile. This suggests that EM indices are better at capturing the business risks of a firm’s operations than traditional indexes.

**A more reliable tool for investors**

In the face of **prolonged market uncertainty**, asset managers need to pull out all stops to reassure existing clients and secure new ones. As shown above, EM indices can help. By culling information from all listed firms, domestic and foreign, EM indices reliably size up firms’ exposure to countries better than traditional indices. In other words, EM indices could be used to confidently deconstruct the returns of a particular firm by country source, and hence, ascertain the firm’s exposure to a specific country.

We recommend that portfolio managers who are bullish on a country tap EM indices to identify companies that provide maximum exposure to a country, regardless of where the companies are headquartered. Managers wary of investor protections in a country but upbeat about its economic prospects can use EM indices to identify non-domestic firms with high exposure to that country.

All that remains is for index providers or investment consulting firms to compile the indices on a routine basis – a time-consuming, expensive endeavour that will prove to be well worth the trouble.

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About the research