

Flight to quality

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Ashwin Malshe, Shantanu Mullick and Nicolas Glady share their new model based on research of trade finance costs during the global financial crisis of 2008–2009, and suggest this could help prepare for any future shocks

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he restriction of the availability of credit by banks was one of the biggest fallouts from the global financial crisis, which had a significant impact on international

trade finance.

Many have identified this as a potential cause for the sharp decline in global trade, as more than 90% of trade transactions involve some form of credit, insurance, or guarantee. Understanding the variations in trade finance costs during this period has now become a critical issue for policymakers as they try to ensure adequate availability of trade finance during future crises.

Initial studies have suffered from a number of inconsistencies due to the methods adopted, as well as the disputed length of the 2008 crisis. For example, a number of investigations used a survey approach, the subjective components of which can yield a strong bias in responses.

In addition, responses can also be difficult to verify, as financial managers may over or underestimate their trade finance costs, depending on the country in which they operate. Lastly, survey research is carried out over a defined period, making it impossible to capture the variation of trade finance costs over time, unless, of course, the survey is carried out each year.

A different model of research

Research from the SWIFT Institute from the ESSEC Business School puts forward a new Bayesian dynamic hierarchical linear model (DHLM), which analyses and explains the variations in trade finance across multiple countries during the global financial crisis, without the biases suffered by survey methods. A similar model has been successfully used for a number of marketing and statistical studies.

The dynamic element gives the model a critical advantage because it can be easily scaled up. This allowed the researchers to add additional levels to the model hierarchy, meaning they could study the model at a more granular level. (For example, analysing the time-varying effect of firm-level drivers on trade finance costs.) Additionally, the team were able to add more macroeconomic variables that impact the trade finance costs of a country (within this study the academics studied the effect of four macroeconomic indicators: GDP growth, inflation, market capitalisation, and trade/GDP ratio).

Furthermore, the hierarchical element enabled the academics to pool data from across different countries, while providing countrylevel parameter estimates. Despite the fact that the academics only had limited indicators from each country to work with, they were able to combine information from other countries to obtain reliable estimates for the impact of certain macroeconomic indicators, such as inflation. In order to account for the evolution of trade finance costs of countries, the academics made the parameters of the hierarchical model dynamic, i.e. time-varying.

The research team found that the model had very few limitations, due to the computationallyintensive method that was adopted. For example, an increase in the longitudinal aspect of the data (such as the number of years) or an increase in the cross-sectional aspect of the data (the number of countries for example) lead to an exponential increase in the computational time. The cross-sectional aspect of the data also placed specific demands on the memory requirements of the computer, meaning the academics could accurately calculate the computing requirements the model would require to run. (It should also be noted that the model can be applied to syndicated loan costs, not just trade finance.)

Some of the most interesting results and insights from the model include:

- Overall, GDP growth has a positive impact on trade finance costs, and this impact shows a declining trend from 2006 to 2009, with no change in the impact from 2009 to 2010. In other words, companies from countries with high GDP growth faced higher trade finance costs before the financial crisis. However, as we moved towards the financial crisis, trade finance costs declined.
- Inflation has an overall positive impact on trade finance costs. In contrast to the impact of GDP growth, the impact of inflation slowly rises over 2006-10. However, the 90% posterior probability band includes zero in four out of five years, indicating less reliable estimates. Nonetheless, the overall pattern suggests that the companies belonging to the countries with more inflation faced higher trade finance costs during the financial crisis.

These findings are consistent with the "flight to quality" theory, which occurs when investors move their capital away from risker investment to safer alternatives, in reaction to uncertainty in global financial markets.

A crisis is never cheap

The analysis produced a somewhat counterintuitive finding that firms from countries with higher market capitalisation (relative to GDP) faced increasing trade finance costs during the crisis; see the lower left panel of figure 1.

This is surprising, particularly given that the researchers used stock market capitalisation as a proxy for the development of financial markets. Normally, one would expect that during a financial crisis, firms from countries with welldeveloped financial markets would see lower trade finance costs, but instead the result went in the opposite direction.

Similarly, the impact of the trade/GDP ratio on the cost of trade finance also increased during the financial crisis. This variable was included in the model to measure the trade intensity of a country. The results indicated that, during the financial crisis, the countries with a higher reliance on trade faced higher trade finance costs. To some extent, this is expected because higher reliance on trade finance might make these countries risker during a financial crisis. It should be noted that although this was not the main focus of the research, the academics believe that a more detailed scrutiny of the findings will likely benefit future research in this area. "It has never been more important to have the tools in place to plan for mitigating future crises"

Reference

 See SWIFT Institute working paper at http://bit. ly/2bXhmaG

Country specifics

At an individual country-level, the researchers found that the standard errors of the estimates are too large to accurately predict the impact of GDP growth and inflation on trade finance costs. This is not surprising as there is a huge amount of complexity involved in modelling parameters from a small set of observations, and can be demonstrated in figures 2 and 3 which have estimates of confidence intervals (CIs) that included zero.

However, the research team did find several instances where the CIs did not contain a zero (see figures 4 and 5). Figure 4 clearly shows the impact of stock market capitalisation on trade finance costs for each country. For Brazil, although in the first three years the impact is relatively flat, between 2009 and 2010, the estimates increase significantly. Similarly, in Greece, Russia, Ukraine, UK and the USA, a substantial rise in costs during the same period is evident.

Figure 5 shows the estimates of the impact of trade intensity on trade finance costs for each country from 2006 to 2010. Again, the researchers found that several of the estimates were statistically significant. The estimates are particularly large across the board from 2009 to 2010, which suggests that the model is also able to capture the dramatic effect of the financial crisis on trade finance costs.

Overall, the DHLM was able to accurately capture the time-varying impact of the four macroeconomic variables on trade finance costs – with the exception of inflation, which was somewhat weak because in four out of five years the confidence interval included zero. Nonetheless – and considering the academics only included 40 observations in their sample – the model was able to accurately project 25 estimates i.e. five for each of the four macroeconomic indicators and the intercept.

Using the model

With cracks starting to appear in some of the world's largest economies, most notably China, it has never been more important to have the tools in place to plan for mitigating future crises. The DHLM not only affords academics and policymakers the tools to understand the extent of the impact of the last financial crisis, but also helps enable them to predict which countries are more likely to be affected in a future recession. This could therefore assist in alleviating any potential sudden "flight to quality" and the ensuing downturn in globe trade.

Note: Modelling the costs of trade finance during the inancial crisis of 2008-2009: an application of dynamic hierarchical linear model was published on 30 June 2016 as SWIFT Institute working paper no. 2012–008

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Figure 1: Estimates of pooling equation (θ 2)





Figure 3: Estimates for observation equation (θ ,) for inflation



Figure 4: Estimates for observation equation (θ_{1}) for stock market capitalisation/GDP



Figure 5: Estimates for observation equation (θ_1) for trade/GDP

