

Foreign Direct Investment as a Determinant of Cross-Country Stock Market Comovement

In the post WW2 period, the cross-country correlations between the stock markets in developed economies were fairly low, implying significant potential benefits from diversification. Beginning in the mid 1990s, stock market correlations started increasing and continued to do so up until the aftermath of the Great Recession. These increases have been quantitatively large; for example the correlation of US equity returns with the equity returns in an aggregate index of other developed economies has risen from below 0.4 in the 1980s to above 0.8 in the 2010s and a similar pattern emerges when looking at bilateral developed country pairs. The increase in stock market correlations has coincided with a concurrent strengthening in foreign direct investment (FDI) linkages between the largest economies with developed equity markets. The aim of the project is to explore the relationship between these two phenomena.

We propose an intuitive mechanism through which increases in bilateral FDI positions can lead to higher stock market correlations between two countries. Because multinational corporations engage in FDI abroad, they become exposed to country specific TFP shocks in the foreign country. In an environment with increased FDI, firms generate a larger fraction of their earnings abroad. This implies stronger incentives to increase investment in response to shocks in the foreign country. In the presence of intangible technology capital, increased investment abroad can also spill over to investment at home, due to the complementarity between tangible and intangible capital. Investment and capital are therefore more synchronized across multinationals and this implies their equity values are also more correlated. We first establish an empirical link between the comovement of stock returns with international stock markets and FDI. We provide evidence that the returns of multinational firms comove with foreign stock markets more than the returns of non-multinational firms; this is more so when multi-national firms have more intangible assets, or have high R&D expenditure, which is consistent with our theoretical mechanism. Additionally, using a panel of 21 developed economies, we also find that increases in FDI of the order of magnitude observed across these countries, are associated with increases in their bilateral stock market comovement that are sizeable, positive, and highly significant, even when controlling for trade.

With this empirical evidence in place, we propose a production-based asset pricing model (see Jermann, 1998) extended to two countries and, crucially, incorporating multinational firms investing in technology capital as in McGrattan and Prescott (2010). To quantify the importance of the mechanism, we add country-specific shocks, introduce incomplete international asset markets and calibrate the model to two regions, the US, and the rest of the world. We find that the observed increase in FDI positions leads to a rise in stock market correlation from 0.380 to 0.520, accounting for one third of the overall observed increase.

When markets are incomplete, a firm's FDI operations provide access to foreign markets and, at the same time, offer diversification benefits for its shareholders. The model assigns FDI an important role in explaining stock market comovements, even when abstracting from the diversification channel.

To show this, we recompute our experiments assuming a complete set of contingent claims available to shareholders. In that case, firms' investment decisions are decoupled from portfolio diversification considerations. We find that the level of stock market correlation increases as markets become more complete, as expected. However, the increase in stock market correlation when FDI linkages are strengthened is present for all asset market structures, including the two extremes of complete markets and financial autarky. This is even though the correlation of dividends can be quite different across market structures and can go up or down in response to the FDI increase, depending on the degree of market incompleteness. Thus, the divergence between the comovement of dividends and the comovement of equity prices, highlighted in Jordà, Schularick, Taylor and Ward (2019), can be

rationalized in our model by incomplete markets. The key insight from the production asset pricing model is that equity price comovements must reflect comovement in investment and capital across multinationals, but can be entirely independent of dividend comovements.

Concurrently with the increase in FDI, the US experienced moderate increases in cross-border equity holdings, as well as in goods trade with other developed economies. Our work also sheds light on the contribution of those two changes to the stock market comovement. Consider first cross-border equity holdings. In contrast to standard models of diversification as in Heathcote and Perri (2004, 2013) where FDI and portfolio diversification are treated as interchangeable, our model allows for a distinction and thus a non-trivial interaction between the two. When we introduce cross-border equity holdings to the model, and allow them to rise exogenously at the same time as FDI and in line with the data, this does not generate additional increases in the stock market correlation. We also extend our model to allow for trade as in McGrattan and Waddle (2020). In our setup, trade and FDI are substitutes reflecting the focus of the model on horizontal FDI between developed economies. As a result, an increase in trade tends to decrease FDI and hence stock market correlation. Thus, in our experiments, increased trade does not contribute to stock market comovement either.

The mechanism we propose highlights a key role for FDI in explaining stock market correlation over and above any indirect effects it might have through inducing GDP synchronization. Our calibration exercise suggests that increased GDP synchronization could have also played a role.

Journal of Monetary economics has requested a second revision of the paper. The revision has been submitted in March.

Seminars:

- Sabaci University Business School
- Stony Brook University, Economics department