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Local versus global factors weighing on stock market returns during the COVID-19 pandemic

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ABSTRACT

We use stock market returns and a new, weekly available, GDP tracker to estimate a structural VAR identified with long-run restrictions. We find that global ‘news’ contribute more than local ‘news’ shocks to explaining the recent variance of equity returns from developing and small developed countries. Since data do not (yet) point to an increase in financial integration during the current pandemic, our investigations support the alternative that these markets hold too optimistic views on their prospects and future ties with the global economy.

1. Introduction

For several days, back in March 2020, worldwide media attention concentrated on the number of daily new COVID-19 infections and deaths in Italy – the first Western democracy to impose a country-wide lockdown. Once it was clear this shock would have global repercussions, uncertainty became ubiquitous. Stories were reported about analysts rummaging out for unconventional indicators (e.g. pollution levels, traffic, energy consumption) to track in real-time the extent of the economic damage inflicted by the restrictions (e.g. on working, social mobility) imposed in an increasing number of countries during the first months of 2020. Unfortunately, within highly integrated financial markets, any overlapping between local and global information flows can have substantial consequences for investors, who become unable to distil changes in fundamentals from noise (King and Wadhwani, 1990). This becomes a greater challenge in an uncertain geopolitical context, in which many countries and policy-makers see more gains from autarky rather than from coordination and integration. For those investors and entrepreneurs unable to internationally diversify their portfolios or financing sources, the consequences can be far too great.

When causality directions swing widely, from local to global factors and vice-versa, the global financial network configuration can be subject to sudden changes, as idiosyncratic shocks spill over to create aggregate disturbances and contagion risk rises. To expose the undirected network characteristics of financial time-series, Diebold and Yilmaz (2014) propose an approach based on generalised (i.e.

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no identification therefore) variance decomposition that has proved extremely successful in empirical works. While adding a structural identification can be too restrictive in some cases, without one their method can be slow in picking up relevant contemporaneous relations in the form of directed causality influences and spill-overs, which are pervasive in financial series (at both high and low frequencies). To work with a structural identification, however, we had to simplify the global network structure we consider in the empirical analysis; we thus concentrate only on exposing local versus global factors’ interactions in this paper. Therefore, we estimate a structural VAR model featuring a financial variable (encompassing beliefs) and a weekly proxy of economic activity (fundamentals) – each of them with both local and global origins. Inspired by a large literature documenting the forward-looking nature of equity markets, we use long-run restrictions to separate ‘news’ shocks from transitory shocks (as in Beaudry and Portier 2006; Chahrouh and Jurado, 2018). We then apply variance decomposition methods to understand the main drivers of local stock market returns in 36 (developed and developing) countries. Our main research question: Has the local stock market been reacting more to the changing local or global economic prospects? This is a relevant question, particularly for local investors without diversification opportunities or for entrepreneurs seeking favourable financing conditions abroad, because it can help reveal in advance market’s expectations and attitude towards local economic policy-making.

Financial integration might provide an answer biased towards confirming the importance of global factors over the local ones, as markets tend to overreact to strong common shocks (Alter and Beyer, 2014). Amongst the few relevant studies, Borgioli et al. (2020) analyse European financial integration during the current pandemic, concluding on a positive note. However, the lack of high-frequency indicators on economic activity across a large number of countries has so far prevented a rigorous empirical analysis on the interaction between financial and real factors. We exploit a newly available GDP tracker, hosted by OECD and developed by Woloszko (2020), who implements machine learning algorithms to work directly with Google Trends data (see Section 2 for details).

We find that transitory shocks have increased their contribution to explaining the recent variance of equity returns in all countries, but are nevertheless dominated by the contribution of ‘news’ shocks. Moreover, within this latter group, global ‘news’ contribute more than local ‘news’ shocks in developing and small developed equity markets. This suggests either that financial integration has increased during the pandemic – although available data does not (yet) confirm it –, or that developing markets hold too optimistic views on their prospects and future ties with the global economy.

2. Methodology and data

For each country, we estimate a structural vector autoregressive model (augmented with an exogenous component) specified as follows:

$$Y_{ct} = \alpha + \sum_{j=1}^{2} \beta_j Y_{c,t-j} + \gamma VIX_t + \epsilon_t$$

where $Y_{ct} = [L_{Economy_{ct}}, L_{Returns_{ct}}, GEconomy, GReturns]$ is a four-dimensional vector including the following variables: (i) weekly changes in the OECD GDP tracker for the local economy, denoted by $L_{Economy_{ct}}$, (ii) local market weekly stock returns, i.e. $L_{Returns_{ct}}$, and (iii) their global counterparts, denoted by $GEconomy$ and $GReturns$, respectively; c and t are country and time subscripts, respectively; to simplify notation, we dropped the country subscript for coefficients. For GReturns, we use the returns of the MSCI index, while the GEconomy is proxied using the first principal component of the GDP trackers from all 36 countries in our dataset. All data on local equity indexes are taken from Bloomberg (Table T1 in the Supplement gives the full list of countries along with their main equity indexes considered in the analysis). The GDP tracker leverages on the ability of Google Trends to reflect real-time changes in various indicators relevant for economic activity, as proxied by consumers’ behaviour; methodological notes regarding the construction of the GDP tracker together with robustness checks are detailed in Woloszko (2020).

To eliminate residual autocorrelation and maintain a parsimonious specification, we impose a two-lag structure for all the estimated country models. To capture other common/systematic factors that might influence the dynamics of the model endogenous variables, we add the (log) VIX index as an exogenous factor. Estimation sample spans from January 2017 to January 2021, at a weekly frequency; nevertheless, to reveal the impact of the COVID-19 shock, we split it in two subsamples, i.e. before December 2019 and after February 2020.

This type of joint modelling for stock market returns and economic activity encapsulated in eq. (1) is not new in the literature. Beaudry and Portier (2006) use an analogous setup to exploit the fact that stock prices react immediately to information regarding future productivity changes. Here we are interested in quantifying the relative weight of local versus global ‘news’, acknowledging that our OECD tracker is an imperfect proxy of productivity. To gain insights, we apply variance decomposition methods based on a

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1. The pervasiveness of directed causality interactions in financial markets is evident from our Italian example above. Allowing for contemporaneous interactions is also important since some of our data is only available on a weekly basis – a long time interval from a financial investor’s perspective. Our approach, however, is general enough to be applied in different settings, especially where it is likely that significant spill-overs occur at higher frequencies (e.g. minutes) than those available for standard time-series analyses (e.g. hours, days).

2. Data is available only starting January 2017 from the OECD website: https://www.oecd.org/economy/weekly-tracker-of-gdp-growth. To construct the GDP tracker, Woloszko (2020) combines information from Google Trends regarding consumers’ searches for unemployment benefits, real estate agencies and mortgages, food banks, transport, vehicles and households appliances etc.

3. January 2020 can be seen as the uncertain start of the global pandemic, and is omitted from both subsamples.
structural decomposition, where identification is performed using long-run restrictions. With stock prices being a forward-looking (i.e. jump) variable, a just-identified system requires a total of six restrictions, which we impose as follows:

- Restriction (1): over the long-run, local stocks do not react to transitory local shocks since they do not convey information about structural changes in the economic productive capacities.
- Restriction (2): over the long-run, global stock markets do not react to transitory global shocks.
- Restrictions (3)-(6): given the small-open economy setup, in the long-run local shocks do not affect any global variable.

Restrictions (1)-(6) allow for unhindered contemporaneous relations amongst and between local and global factors, therefore, accommodating a variety of possible interactions depending on the direction of information flows.\(^4\) For a more formal proof, we follow Philippas and Dragomirescu-Gaina (2016) in order to expose these causality patterns by applying partial Granger causality tests, which are robust to omitted variables and model misspecification; results are illustrated in Table T2 from Supplement.

\(^4\) As discussed in Introduction, for the Italian case, allowing for short-term bi-directional causalities is key for the model’s performance.
3. Results

Fig. 1 presents the contribution of each shock to the variance decomposition of local stock market returns at an eight-week horizon, which is sufficient for obtaining stable decomposition shares and robustness for our exercise.\(^5\)

As expected, before the pandemic, stock market returns were affected mostly by ‘news’ shocks, with both local and global origins. Across countries, developing economies were more exposed to local factors, while developed economies were more exposed to global factors. This situation however changed after 2020, when the contribution of transitory shocks to the variance decomposition of local equity returns increased, along with the total contribution of global shocks.

As shown in Fig. 2, almost all developing countries (together with a few developed ones that are small in terms of economic and financial size, e.g. Latvia, Israel) cluster farther away from the main diagonal – i.e. they witness bigger changes in the contributing ‘news’ factors during the pandemic. In particular, local ‘news’ shocks have become less (while global ‘news’ shocks have become more) significant contributors to the variance of local equity market returns.\(^6\)

To gain more insights, we compute a basic proxy of financial integration as the GDP share of total cross-border exposures

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\(^5\) Bolboaca and Fisher (2021) discuss robustness in case of identifying ‘news’ shocks with different strategies and datasets. Given our weekly data frequency, the eight-week horizon represents a compromise that might somehow dilute the forward-looking content of the identified ‘news’.

\(^6\) In contrast, most developed countries lie closer to the main diagonal in Figure 2, suggesting relatively small (if any) changes in the contribution of ‘news’ across the two subsamples. We also show in the Supplement that the contribution of global transitory shocks does not discriminate between country groups, nor does it correlate with financial integration.
(considering both financial claims and liabilities). As expected, and in line with our results above, the cross-sectional correlation of local factors’ contributions with this financial integration proxy is negative and statistically significant, i.e. more financially-integrated countries suffer less from local factors’ influences (see Table T3 in the Supplement). However, the main driver of these correlations are the ‘news’ components, not the transitory ones. Because stock markets tend to disregard transitory factors over the long-run, the dominance of global over local ‘news’, and only in developing countries (as revealed in Fig. 2), might suggest either: (H1) that financial integration is already advancing, or (H2) expected to advance in the medium-to-long term, thus justifying an optimistic view regarding these markets’ future ties with the global economy. In Fig. 3 we show that recent BIS data on cross-border exposures do not yet confirm (H1), so hypothesis (H2) becomes more likely in this case.

In search for a possible explanation behind the more optimist view, we note that higher financial integration does correlate with less significant contributions from local transitory factors (such as policies) that normally weigh significantly on local economic and financial conditions (see Table T3 in the Supplement). It seems therefore reasonable to endorse an optimistic view more in tune with global dynamics, particularly if investors in developing markets prefer to overlook the effects of local policy errors that would show up in the transitory factors (e.g. Brazil can be an interesting case study here).

4. Conclusions

In a structural VAR identified with long-run restrictions, we find that global ‘news’ contribute more than local ‘news’ shocks to explaining the recent variance of local equity returns from 36 countries. This is particularly so for developing and small developed countries, and might suggest that financial integration during the pandemic has increased or is expected to do so in the medium-to-long term. Since available data do not (yet) confirm this trend, the alternative explanation, which we back with a simple correlation analysis, is that investors might hold too optimistic views on developing markets’ prospects and future ties with the global economy.

Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.frl.2021.102270.

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7 Since changes in financial integration would predate changes in economic integration, we concentrate on the former. Data on cross-border exposures are from the Bank for international Settlements (or BIS), Locational Banking Statistics, Table A3-S. See the Supplement for more details.
8 Since COVID-19 leads to a common global ‘news’ shock, risk-sharing mechanisms (e.g. Colacito et al., 2018) cannot fully explain capital flows’ movements across countries.
9 The latest available data on cross-border exposures for 2020:Q3, combined with the latest GDP projection for 2020 (from IMF October 2020 WEO), do not reveal any increase in financial integration, particularly for developing countries. Except for BIS Locational Banking Statistics, other possible sources of capital flows (e.g. IMF) do not report any data for 2020 (as of March 2021).
10 In Table T3 from the Supplement, we show that, only for developing countries, the contribution of transitory local shocks correlates negatively with financial integration in the post-2020 subsample.