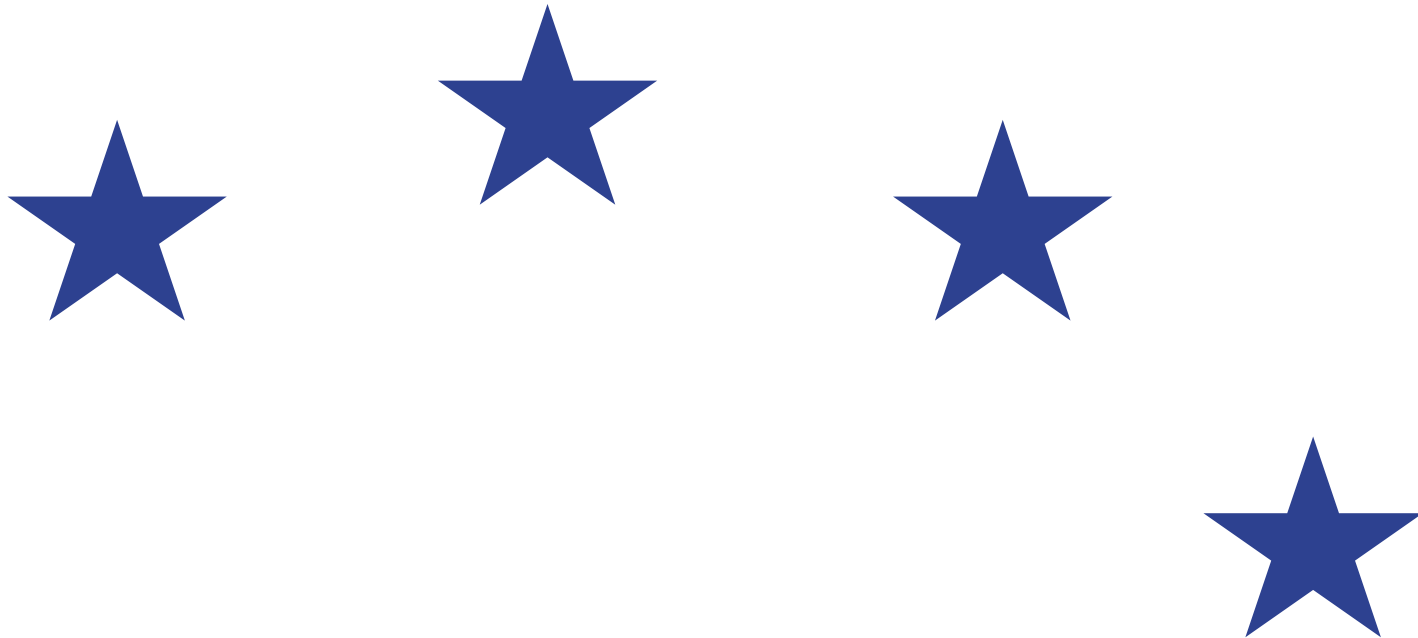


**TRV** Risk  
Analysis

# Leverage and derivatives – the case of Archegos



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ESMA Report on Trends, Risks and Vulnerabilities Risk Analysis

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## Financial Stability

# Leverage and derivatives – the case of Archegos

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### Summary

In March 2021, the default of Archegos, a US family office, led to large losses for some global banks. Archegos was able to accumulate large exposures to and leverage on equities by entering into derivatives transactions with bank counterparties. When the price of the underlying stocks started to decline, the firm was unable to meet variation margins, resulting in the liquidation of the stocks by the counterparty banks. In this article, we use EMIR data to analyse Archegos positions and show that it is possible to track the steep increase in concentrated exposures that the family office undertook in February and March 2021. Our findings show how regulatory data collected under EMIR can be used to monitor leverage and concentration risk in derivatives markets.

### Introduction

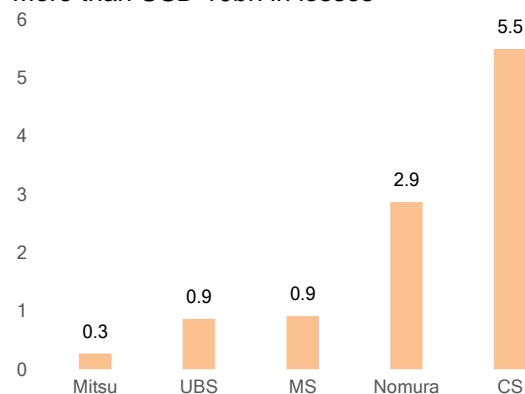
On 26 March 2021, Archegos Capital Management, a US family office, defaulted on margin calls from several derivatives counterparties. Following the default of the firm, dealer banks liquidated the derivatives positions, including through forced sales of stocks, resulting in more than USD 10bn in losses for counterparty banks (Chart 1).

While the collapse of Archegos did not impact financial stability — as the event occurred during a calm period in the markets and exposed banks were adequately capitalised — the event raises a range of issues related to the use of derivatives to acquire leverage.

The firm obtained large exposures on a handful of stocks by entering into total return swap contracts with a few dealer counterparties. By replicating similar positions across counterparties, Archegos was able to take very large positions, which remained unknown to its counterparties, other market participants and regulators, because family offices are exempted

from reporting requirements that apply to funds at entity level.

Chart 1  
Direct losses related to Archegos  
More than USD 10bn in losses



Note: Reported losses in USD bn as of April 2021. Mitsu: Mitsubishi UFG; MS: Morgan Stanley; CS: Credit Suisse.  
Sources: Company disclosures, ESMA.

This article reviews the collapse of Archegos by delving into the investment policy employed by the firm. Using EMIR data, Archegos positions with EU counterparties are analysed. We find that in early 2021 — two months before its demise — there were warning signs that Archegos had

<sup>1</sup> This article was written by Antoine Bouveret and Martin Haferkorn.

substantially increased its exposures to a few stocks, making the firm highly vulnerable to adverse market developments related to these shares<sup>2</sup>.

Our analysis shows how supervisory data can be used for risk monitoring purposes. We also review data gaps and reflect on the regulatory lessons learned from the collapse of Archegos.

## Archegos capital management

Archegos, formerly known as Tiger Asia, was a hedge fund founded in 2001 by a U.S. investor. Tiger Asia implemented long/short equity strategies and long-only equity strategies with a focus on Asian issuers (Credit Suisse, 2021). In 2012, Tiger Asia reached a settlement with the US Securities and Exchange Commission (SEC) related to insider trading<sup>3</sup>. Subsequently, Tiger Asia returned its outside capital to its investors, changed its name to Archegos and became a US family office with USD 500mn in assets in 2013. Since family offices do not generally raise outside capital, they are typically excluded from reporting requirements that apply to private funds (Table 1).

Over the years, Archegos pursued an investment strategy focused on long positions in a few stocks, usually in the technology sector. Instead of purchasing stocks to gain exposures to the securities, Archegos used total return swaps which allowed the firm to obtain leverage through synthetic prime brokerage, which can be defined as “*the use of derivatives such as swaps to obtain exposure to an asset, in place of traditional cash/security lending*” (Bank of England, 2017).

In a stylized total return swap (TRS) transaction, the two counterparties agree to exchange the performance of an underlying asset. For example, a hedge fund would enter into a TRS trade on stock 1 (as underlying) with dealer ABC for a notional amount of EUR 10mn. Archegos would post an initial margin of a fraction of the notional exposure (say 15%) to obtain a long exposure on stock 1. Dealer ABC would in turn purchase stock 1 shares for EUR 10mn<sup>4</sup>.

<sup>2</sup> This analysis complies with the professional secrecy provision laid out in Article 83 of EMIR, thus reference is made to relative amounts, in order to avoid identification of entities or stocks.

<sup>3</sup> Related to the same case of insider trading, Hwang and Archegos were banned in 2014 from trading securities in Hong Kong for four years.

Table 1

Regulatory framework and economic importance

### What are family offices?

In the US, family offices are “*entities established by wealthy families to manage their wealth and provide other services to family members, such as tax and estate planning services*” (SEC, 2021a). Any company that provides investment advice only to family clients is wholly owned by family clients and exclusively controlled by family members and/or family entities, and does not hold itself out to the public as an investment adviser is considered a family office by the SEC. In the US, family offices are exempted from regulation under the Investment Advisers Act of 1940. In particular, unlike hedge funds, family offices are not subject to reporting requirements under Form PF, which provides the SEC and the US Financial Stability Oversight Council (FSOC) with confidential information about the operations and strategies of private funds.

In the EU, there is no explicit definition of family offices. However, Recital (7) of the AIFMD provides that “*Investment undertakings, such as family office vehicles which invest the private wealth of investors without raising external capital, should not be considered to be AIFs [Alternative Investment Funds]*”. As a result, family offices which do not raise capital, as set out in article 4(a)(i) of AIFMD, are generally not considered AIFs and hence not subject to regulatory and reporting requirements under AIFMD.

While it is challenging to measure precisely the asset under management (AuM) of family offices, Insead (2020) provides estimates of around USD 5.9trn as of end-2019.

If the price of the underlying increases by 10%, the hedge fund would receive USD 1mn in variation margin from the dealer counterparty. If the price were to decline by 10%, the hedge fund would have to post USD 1mn in variation margins to the dealer counterparty.

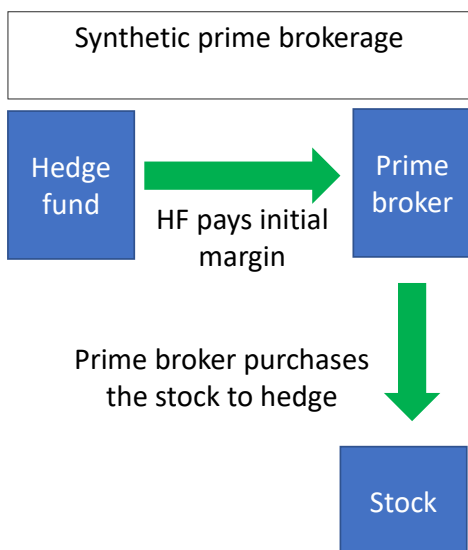
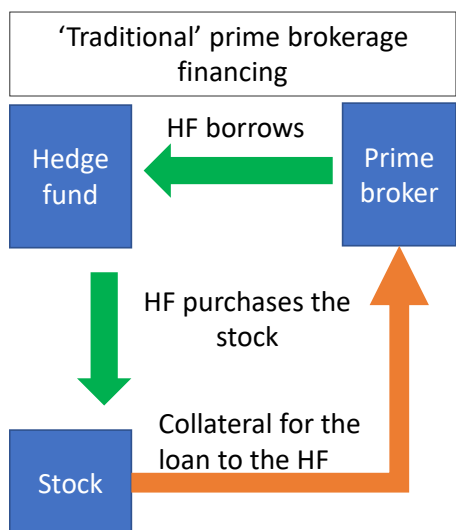
Using TRSs instead of equities provided a range of benefits to Archegos and its counterparties. TRSs allowed Archegos to obtain leverage: the firm obtained synthetic exposures representing around six times its capital. Without derivatives, Archegos would have needed additional funding (through repo or margin lending transactions backed by collateral) to get similar exposures.

For example, an initial margin of 20% on TRSs would allow a client with EUR 100mn to obtain exposure to EUR 500mn, resulting in a leverage of five<sup>5</sup>. The client would agree to pay the amount of any decrease in the value of the stock to the bank counterparty, and the bank would agree to pay the amount of any increase in the value of the stock. To hedge its positions, the bank would purchase the underlying stock (Chart 2).

<sup>4</sup> In practice, dealer counterparties may only purchase a fraction of the underlying depending on the sensitivity of the value of the TRS to changes in the underlying (‘delta’).

<sup>5</sup> Credit Suisse (2021) reports that in 2019 the average initial margin on the swap portfolio declined from 20% to 7.5%.

Chart 2  
Prime brokerage financing  
Synthetic and traditional financing



Source: Authors

If the client would rely on ‘traditional’ prime brokerage financing, it would borrow EUR 400mn from the bank and purchase EUR 500mn of the stock. The bank would have no exposure to the stock, but it would hold it as collateral for the loan (Credit Suisse, 2021).

For the banks, TRSs allow to be perfectly hedged (by purchasing the underlying security), which results in lighter regulatory requirements than traditional cash prime brokerage financing.

<sup>6</sup> In the EU, the Transparency Directive imposes notification requirements on holders of shares to which voting rights are attached. Member states have the discretion to impose notification for capital holdings, which include TRSs. National rules differ by countries.

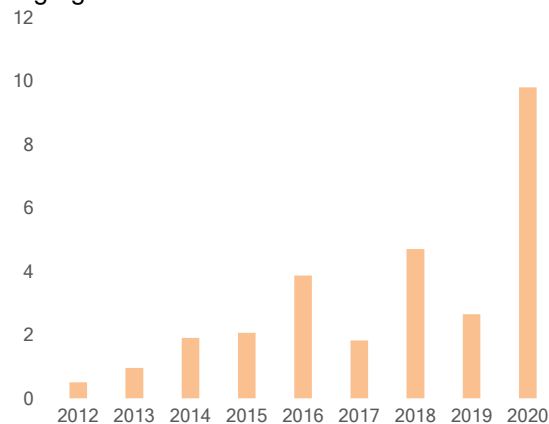
In addition, by using derivatives, Archegos did not have to disclose its stakes in the different companies it was exposed to. In the US, market participants have to disclose their stakes in companies only if they own more than 5% of the shares but synthetic exposures are not included<sup>6</sup>.

Overall, Archegos operations were largely invisible to regulators and market participants (being swap counterparties). As a family office, Archegos was exempted from reporting requirements to the SEC and FSOC. By using derivatives, Archegos did not have to disclose its stakes in companies (while the bank counterparties had to disclose their positions). In addition, reporting rules for security-based swaps (such as TRSs) entered into force only in November 2021, e.g. more than 7 months after the demise of Archegos.

## The rise and fall of Archegos

Between 2012 and 2020, the net asset value of Archegos surged from USD 500mn in 2012 to almost USD 10bn by the end of 2020 (Chart 3). During that period, Archegos experienced large drawdowns (-53% in 2017 and -44% in 2019), reflecting the risky investment strategies being pursued by the firm.

Chart 3  
Net asset value of Archegos  
High growth in 2020



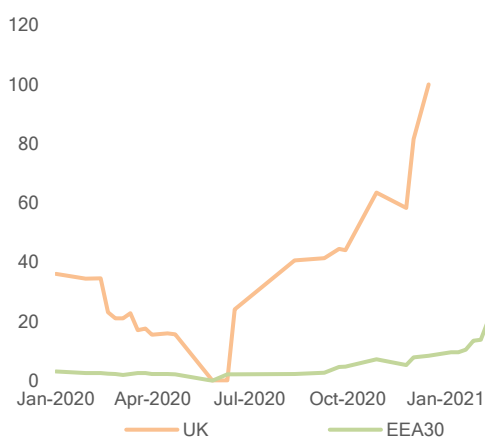
Note: Net asset value of Archegos, in USD bn.  
Sources: Credit Suisse (2021), ESMA.

According to Wilkes (2021), exposures through TRSs would be subject to notification requirements in CZ, DE, ES, FR, IT, LI, LU, PL but not in HR and NO.

To obtain a more granular view of Archegos exposures, we use EMIR data<sup>7</sup> which cover derivatives transactions. To analyse Archegos' positions we use two datasets: weekly trade state data, which provide a snapshot of outstanding derivatives, and trade activity data, which track lifecycle events of derivatives over time. As long as Archegos was using an EU counterparty, this counterparty had to report the derivative transaction in EMIR, which are in turn reported to ESMA. The relevant trade messages received under EMIR during the period 2020-2021 covered eight EU counterparties among six banking groups across hundreds of trades<sup>8</sup>. Although EMIR offers a partial view of Archegos positions since the firm was using non-EEA30 counterparties, detailed information reported to Trade Repositories provide important insights into the risks related to Archegos.

Between January and end-2020, Archegos increased its exposures to TRSs, with notional amounts surging by approximately 180% (Chart 4). Since most of the reported activity was done through UK banks, Archegos' exposures dropped mechanically in early 2021 when UK entities stopped reporting to EMIR. However, using EEA30 data, we can see a steep increase in exposures in February and March, with a jump in notional of approximately 365% from mid-January to mid-March.

Chart 4  
Archegos' exposures to EEA30 and UK counterparties  
Increase in exposures

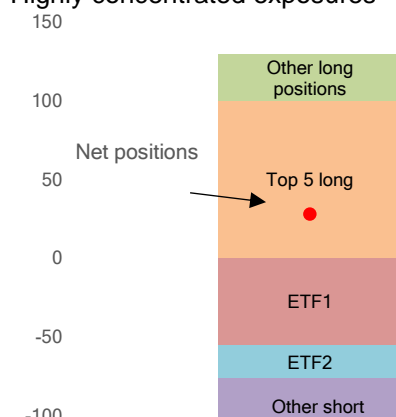


Note: Gross notional exposures of Archegos on equity swaps, rebased as 100=maximum over the reporting period. UK entities stopped reporting to EMIR end-2020.  
Sources: EMIR, ESMA.

For example, as of 26 February 2021, Archegos' gross exposures to EU counterparties were 2.5 time larger than end-2020 levels and its net exposures were seven time larger than end-2020. Its portfolio of swaps was mainly concentrated in five stocks (Chart 5): the top 5 stocks where Archegos had a long position accounted for 80% of its long exposures (and 360% of its net exposure). The EMIR data also show that Archegos was taking short positions on broad market indices: ETF1 for 54% of short net exposures (200% of net exposures) and ETF2 for 21% of short exposures (76% of net exposures). Archegos also had short positions on a few financial institutions for 25% of its short exposures (89% of net exposures).

Combining long exposures on individual stocks in the technology sector and short positions on broad market indices enabled Archegos to be partially hedged against wide market movements (a 'market neutral strategy'): in the case of a negative shock, the loss on the technology stocks would be compensated by the profits on the short positions on the market indices and the other way around in the case of a positive shock.

Chart 5  
Archegos' exposures as of 26 February 2021  
Highly concentrated exposures



Note: Long and short positions of Archegos by underlying, rebased as of 26 Feb. 2021. Data for EEA30 counterparties.  
Sources: EMIR, ESMA.

The trade activity data can be used to track the evolution of Archegos' positions in individual stocks. Chart 6 shows the evolution of trades on stock A. In August 2020, Archegos entered into a TRS with stock A as underlying. Archegos steadily increased its exposure to this stock until end-January 2021, where its exposure was 10 times higher than in August. Then, Archegos'

<sup>7</sup> The European Market Infrastructure Regulation (EMIR) provides for detailed reporting requirements of derivative transactions to trade repositories by EU entities. Only individuals are exempted from reporting requirements.

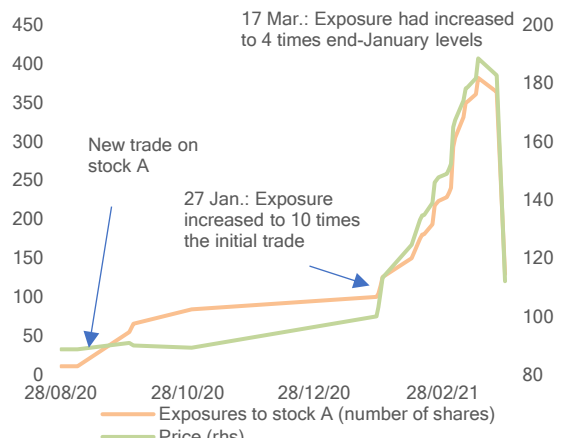
<sup>8</sup> We also looked for Archegos in trade repository data related to securities financing transactions but there were only a few trades, with a small amount.



exposures to stock A increased very substantially, reaching on 17 March up to 4 times its end-January levels (35 times August levels). At the same time, the price of Stock A shares increased by 80% in approximately one month and a half. The surge in equity prices was likely driven by Archegos' increased exposure to stock A, which resulted from an increasing exposure by its counterparties (SEC, 2022b; USDoJ, 2022). One week before its default, Archegos positions on stock A reported in EMIR amounted to more than 3% of the floating and almost twice the average daily trading volume. This is visible from EMIR data even though these only offer a partial view of Archegos positions.

Similar increases in positions can also be seen in other stocks<sup>9</sup>.

Chart 6  
Archegos' exposures to stock A  
Steep increase in exposures end-January 2021

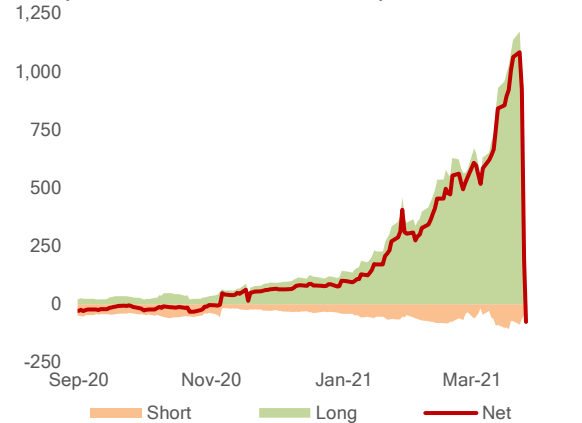


Note: Archegos exposures to stock A via equity swaps with EEA30 counterparties and equity price of stock A, both rebased at 100=27 Jan. 2021. Sources: EMIR, Refinitiv Datastream, ESMA.

EMIR data can also be used to analyse the mark-to-market value of the portfolio of swaps held by Archegos. Since counterparties update the value of the swaps daily, it is possible to monitor changes in the valuation of the swaps. Chart 7 shows the value of the swaps for Archegos. Between September 2020 and January 2021, the value of the swaps increased relatively smoothly, with positive values for the long positions and negative values on the short positions. The value of the portfolio of swaps then surged to a peak on 23 March, at more than ten times its end-January level, driven almost exclusively by profits on long positions. Between early February and 23 March the value of the swaps grew by 250%, reflecting the increase in the value of the underlying stocks

and higher exposures taken by Archegos. Starting on 24 March, the value of the swaps collapsed, falling to a negative value of by 26 March, the day of the default of Archegos.

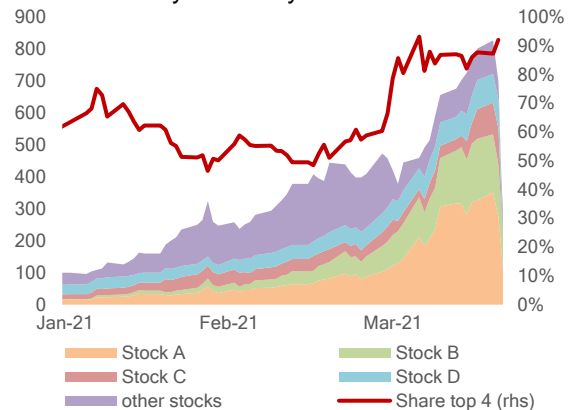
Chart 7  
Mark-to-market value of Archegos swaps  
Steep increase before the collapse



Note: MtM value of Archegos TRS contracts, rebased at 100=31/12/2020. Data for EEA30 counterparties. Sources: EMIR, ESMA.

In addition, the changes in the value of the swaps were almost entirely driven by long positions on four stocks, which together accounted for more than 80% of the mark-to-market value of the portfolio in March (Chart 8). The data show clearly that Archegos had a highly concentrated portfolio and that any negative change in the price of the underlying stocks could trigger large mark-to-market losses and substantial variation margins.

Chart 8  
Mark-to-market value of Archegos swaps  
Almost entirely driven by four stocks



Note: MtM value of Archegos long exposures, rebased at 100=31/12/2020.. Data for EEA30 counterparties. Sources: EMIR, ESMA.

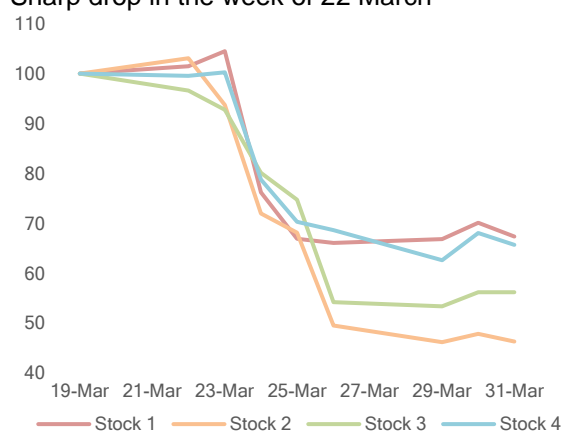
<sup>9</sup> Using bank regulatory disclosures for end-2020, Devasabai et al. (2021) estimate that banks' holding of Archegos-related stocks amounted to more than 20% of the equity of three firms, and more than 40% for another

firm. Relatedly, SEC (2022b) reports that, by end-March, Archegos held more than 50% of outstanding shares in five companies through cash equity and equity swaps.

On 22 March, the price of one Archegos-related stock fell by close to 7% and kept declining throughout the week, as did other stocks Archegos was highly exposed to. The large decline in stock prices led to an abrupt change in the value of Archegos swaps and to significant variation margins being requested by counterparties. When Archegos defaulted, the dealer counterparties had to liquidate their underlying long positions in the stocks, since the banks were no longer hedged. Since Archegos market footprint was substantial in those stocks, large sales by dealers aggravated the decline in prices, leading to substantial losses for some of the dealers, especially those who were slower to liquidate their positions. On 26 March the price of two stocks dropped by more than 27%, reflecting the liquidation of positions by the Archegos counterparties

Chart 9

Equity price of Archegos-related stocks  
Sharp drop in the week of 22 March



Note: Equity price of selected stocks, rebased at 19/03/2021=100.  
Sources: Refinitiv Datastream, ESMA.

## Observations on the collapse of Archegos

The collapse of Archegos raises a number of issues.

### Risk management and concentration risk

The extent of the losses borne by counterparty banks indicates that some institutions faced significant risk management issues. Archegos was able to build large and concentrated positions without being subject to appropriate margin requirements by some of its

counterparties. If initial and variation margins posted by Archegos had been higher, counterparties would have been able to cover better some of their losses related to the liquidation of securities with the margins posted by Archegos<sup>10</sup>. In addition, given the market footprint of Archegos in some underlying stocks, concentration add-ons — additional initial margins required to account for liquidation costs of concentrated positions compared to the market absorbing capacity — could have reduced the ultimate risks borne by the counterparties. However, such concentration add-ons may have failed to capture the risk fully unless counterparties had known all the similar positions Archegos held with other banks.

### Reporting requirements for family offices

While Archegos was legally a family office, it implemented hedge fund-like strategies without being subject to regulatory and reporting requirements at entity level that apply to hedge funds. Without relevant reporting requirements, regulators did not have the ability to identify risks related to Archegos, including high leverage and concentrated exposures. Since family offices do not usually rely on external capital, they are typically exempted from regulatory requirements that apply to funds.

Lack of transparency and data gaps around family offices and their exposures and strategies, therefore, limit the risk assessment by regulators and supervisors. The issue also extends beyond family offices, with other large non-bank institutions such as endowments and sovereign wealth funds, currently not subject to any reporting requirements at entity level.

In the EU, family offices are subject to transaction-level reporting under EMIR for derivatives and under the Securities Financing Transactions Regulation for securities lending, repo, buy-sell backs or margin lending transactions.

### Minimum margin requirements on total return swaps and derivatives reporting

OTC derivatives trades — such as TRSs — which are not centrally cleared by CCPs are subject to initial margin requirements. The requirements are subject to a phase-in period. Counterparties with a gross notional exposure above USD 50bn have been subject to those rules since September 2021 and the requirements will apply to entities with gross notional exposure above USD 8bn from September 2022. Under the standardized schedule approach, TRSs on equity are subject

<sup>10</sup> In some cases, margins were calculated using a static approach where the initial margins were based on the notional value of the swap at inception and remained

constant over the life of the swap, irrespective of increases in the notional (Credit Suisse, 2021).



to an initial margin of 15% (BIS-IOSCO, 2015), which would still allow counterparties to have a leverage of 6 (Khwaja, 2021b)<sup>11</sup>.

Beyond reporting at entity level, the lack of reporting of certain transactions in the US, such as TRSs on a single equity, made the assessment of risks challenging for regulators. In contrast, under EMIR, all derivatives trades, irrespective of the nature of the instrument, have to be reported to trade repositories, making the information available to regulators and supervisors. Reporting requirements for security-based swaps in the US entered into force on 8 November 2021 (SEC, 2021b). In addition, the SEC issued a proposal (SEC, 2021c) that would require market participants to disclose large positions on security-based swaps publicly, when those positions exceed a given threshold (the thresholds vary depending upon the type of security-based swap at issue).

## Synthetic prime brokerage

The default of Archegos has also shed light on the use of synthetic prime brokerage by hedge funds. Synthetic prime brokerage financing is considered more efficient than 'traditional' financing from a balance sheet and/or funding perspective (Credit Suisse, 2021). Devasabai et al. (2021) argue that part of attractiveness of synthetic financing relates to regulatory requirements. Under Basel III capital rules, traditional prime brokerage financing by banks incurs leverage and funding charges. In contrast, synthetic prime brokerage allows banks to reduce capital and liquidity costs by hedging and netting derivatives exposures against their trading book. This differential treatment of synthetic structures compared to traditional cash structures has been put forward as one of the drivers of the growth of synthetic prime brokerage (Bank of England, 2017).

## Recent developments

Following the events of March 2021, regulatory authorities have taken a number of measures to mitigate risks related to the use of leverage by non-bank financial institutions.

In the US, the SEC has recently made a series of proposals to address some of the gaps identified in the wake of the Archegos default. In addition to the reporting and disclosure requirements related

to swaps, the SEC has recently proposed that in the case of extraordinary losses, large redemptions or significant margin events, large hedge fund advisers should report some specific information to the SEC within one business day (SEC, 2022a).

At the international level, the Financial Stability Board (FSB) and the International Organisation of Securities Commissions (IOSCO) have launched work which is aimed at improving risk monitoring using trade repository data and analysing the use of leverage by non-banks (Alder, 2021; FSB, 2021).

In the EU, ESMA and National Competent Authorities (NCAs) have been working on leverage limits in relation with the Article 25 of the AIFMD. As detailed in Guidelines on Article 25 (ESMA, 2020), NCAs have to regularly assess the extent to which the use of leverage by Alternative Investment Funds could contribute to the build-up of systemic risk. While NCAs should base their risk assessment on AIFMD data, the Guidelines acknowledge that for some of the indicators they should use in addition the best available data, including national supervisory data and/or third-party data when appropriate. In that context, data from trade repositories can be used as an input that can complement information reported by AIFs under AIFMD.

## Conclusion

The collapse of Archegos has shown how risks related to leverage, concentration and interconnectedness can crystallize. Beyond headline losses faced by some banks, this event indicates that further work is needed to adequately monitor risks related to derivatives and leverage. At the same time, this article shows some of the ways in which the rich and extensive data collected by trade repositories under EMIR can be used by NCAs, central banks and ESMA to monitor risks.

Looking forward, further work is needed to put forward a framework whereby different regulatory reporting could be analysed together to enable Authorities to monitor risks. For ESMA, this includes continuing the analysis of the reporting information related inter alia to the AIFMD, the Securities Financing Transactions Regulation, EMIR and the Money Market Fund Regulation.

<sup>11</sup> Counterparties could also rely on an approved internal model — such as ISDA Standard Initial Margin Model (ISDA, 2021) — rather than the standardized schedule.

The ISDA model also includes add-on related to concentration (Khwaja, 2021a).

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