“Does climate news sway investors away from large financiers of fossil fuel projects?”

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DOES CLIMATE NEWS SWAY INVESTORS AWAY FROM LARGE FINANCIERS OF FOSSIL FUEL PROJECTS?

Abstract

Despite rapid growth in climate news coverage, some banks are increasing financing towards greenhouse gas emitters with investors whose decisions intensify climate challenges. This study aims to establish the impact of climate news on investment decisions involving banks' intensified fossil fuel financing and recommend remedies. Descriptive, linear regression analyses and the two-sample t-test are applied. The list of bank stems from the Consumer News and Business Channel website. Share prices, traded shares and market capitalizations are obtained from Macrotrends and Companies' market cap websites for computing demand and holding periods. Results reveal more demand for riskier banks after European symposiums in contrast to Asia's reduction. It is established that no significant linear relationships exist between demand and holding periods with $t < T$ and p-value > 0.05. The null hypothesis of no linear relationship is not rejected. There is more price risk in Europe than in Asia with average volatilies of 0.439871 and 0.067472, respectively, at p-value $0.002117 < 0.05$ based on the two-sample t-test. The null hypothesis of no difference in volatility means is rejected. The higher volality risk corresponds to higher demand for riskier bank shares in Europe. Climate news persuades Asian investors to reduce the demand for the banks' shares. Conversely, European investors demonstrate behaviors incompatible with climate risk mitigation, particularly in periods after symposiums. A Global climate risk blacklisting initiative and a publicised Global climate risk index should accompany downgrades aimed at fossil fuel project financiers. Coverage of these measures at conferences may influence more investors to make correct decisions.

Keywords banks, climate news, climate risks, decision-making, demand, emissions, financiers, holding periods, investors

JEL Classification G21, G11, G15

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INTRODUCTION

It would seem an acknowledged fact that some investors find the banking business attractive, including their increased financing of fossil fuels. It is contended in this study that several discussions, reports and debates have taken place around climate changes considering that one of the main events, the Paris Agreement took place in 2015. It would therefore follow that numerous sources pertaining to climate news exist. That being the case, it would seem though, based on continued incremental investments in fossil fuels, that some investors are ignoring the call to divest away from climate damaging investments. Some of these sources are internationally driven, such as the Conference of Parties (CoP) symposiums from which climatic news is gathered and disseminated with the idea of enhancing public awareness across the planet regarding climate change challenges (SGK Planet, 2023). News dissemination seems not to be very effective as banks, due to their immediation function, unfortunately tend to finance more fossil fuel projects.

To illustrate how critical the situation is, the financing of fossil fuel projects by the world's largest banks scaled to a substantial USD 5.5

trillion since the onset of the Paris Agreement, with a further substantial USD 669 billion flowing in 2022 (OCI team, 2023). Furthermore, the report stated that bank financiers of the top 100 gas, oil and coal companies in 2022 constituted 60 banks, of which our calculation revealed that 14 European banks' financing stood at approximately USD 25,979 billion. This is nearly 2% of Europe's gross domestic product (GDP) for 2022.

The continued investor participation in banks increasing fossil fuel financing amidst news highlighting the downside risks of such endeavours is a concern to societies and economies.

1. LITERATURE REVIEW

In this section, related literature, which elucidates the research aim, is explored. It commences with identifying the challenges of bank investments towards fossil fuel projects and the interlink to investors' decision-making.

Banks in different jurisdictions seem encouraged by their balance sheet composition to continue with the negative trajectory of financing GHG emissions projects. Some banks, such as those in China, are endowed with substantial financial capabilities, which in some instances have produced irresponsible lending and investment activities resulting in irreversible environmental damages both within and outside China (Bai, 2011). Chinese banks are, however, not the only ones faced with the choice of financing GHG emissions initiatives. European banks continue to depend on substantial fossil fuel project financing (Cullen, 2018). This dependency syndrome may suggest that alternatives are few or non-existent to provide finance, not only in the fossil fuel category but even for green financing.

When banks display inaction by persistently financing climate-risk projects, they are, in a way, acting against the global climate strategy. The global climate strategy calls for investments to be channelled towards green-friendly projects that support the below 2 degree Celsius call as pronounced during the Paris Agreement. Furthermore, Punzi (2018) describes the strategy as a change in focus from high-GHG emissions projects to low-carbon intensive projects that necessitate companies to develop technology that could lead to a green economy.

Banks are pivotal in the transition from high-GHG emissions to green projects. They play a central role in channelling funds from savers to demanders through financial intermediation. This study contends that if demanders are polluters, then banks, with their information asymmetry advantage, can avoid such polluters by opting for green-friendly companies. Ritter (2022) affirmed that banks' choices of where they direct their cash flows may substantially affect the environmental outlook. Banks can still create shareholder value in cases where their financial returns are reduced as long as risk is reduced disproportionally.

It is argued in this study that regardless of the considerable financial returns, banks are subjected to from the ongoing investments in GHG emissions-related companies, the resultant climatic damages should be equally apportioned to them, just as those companies directly involved in fossil fuels. Any failure to rectify financial flows being channelled to GHG emissions could result in detrimental consequences that transcend the financial sector (Cullen, 2018). Hence, a sense of morality should prevail that balances the potential financial returns to the wider environmental and societal risks.

Commitments to mitigate the toxic effects of GHG emissions should be found in the implementation process of the Paris Agreement. Even where bank efforts to finance green initiatives are acknowledged, the overall portfolios of most banks are still substantially brown (Park & Kim, 2020). Such an assertion may need serious attention. It is argued that nine (9) years after the Paris Agreement, the portfolios should be substantially green. The slow transformation may cast doubt on banks' commitments to take heed of the founding principles of the Paris Agreement.

The slow transformation can result in economic damages emanating from physical and transition-

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al risks. It should not even fractionally escape the global view that climate risk, as was proclaimed by Kress (2022), is detrimental to the global economy. Economic outcomes can range from recessions due to systemic risks in the financial sector, loss of shareholder value in the capital markets due to the decimation of share prices and high unemployment levels.

Hence, investors' participation in these banks may be highly questionable from a moral perspective. They, too, need to observe the dire consequences of climate change. Investors' interests in their financing activities to the banks in question should, in a nutshell, be two-fold: Firstly, the likelihood of climate-related risk defaults is very consequential to the extent that in other jurisdictions, rating agencies are downgrading heavily exposed issuers (Kress, 2022). Defaults can have a domino effect that can affect the entire financial system, and the 2007–09 financial crisis is a vivid reminder of their pervasiveness.

The documented potential effects of funds flowing to fossil-fuel projects should prompt the implementation of acceptable investments towards green projects. However, despite such contentious flows to GHG emitters, it is discouraging to come to terms with the idea that only a handful of investors are conscious of the levels and impact of GHG emissions resulting from their investments (Andersson et al., 2016). This observation is worrisome since, upon realization of the impact of their investments, an exodus of investments away from these financiers at a single moment could trigger another global recession.

However, there seems to be a substantial difference from the global financial recession in that the impact due to the recession was largely financial. More prominently, the rise in global temperatures due to carbon-intensive generated pollution can lead to drastic weather patterns, which in turn cause disorder, which may include sickness, displacements and even loss of life (Durrani et al., 2020). Investors may need to make decisions that embrace the wider impacts not only based on risk and return paradigms.

Several reasons are at play that result in the flow of funds to banks supporting GHG emissions through fossil fuel financing. As pointed out by Campiglio et al. (2018), outright ignorance and a lack of appreciation by investors about the degree of exposure to their investments are apparent. In this instance, issues such as herd behaviour by investors could be dominant. Worse still, some investors could believe that climatic risks are not immediate but are for the future, whilst others may not see beyond the banking institution they are directly investing in.

A lack of appreciation can also be linked to decisions resulting from skills shortages in evaluating risks of a climatic nature. Some decisions hinge on a biased disposition and a remarkable lack of skill in evaluating climatic risks (Condon, 2021). A combination of skills shortages and short-sightedness regarding the wider impact of climate risks is as potent as outcomes based on deliberate actions centred merely on financial gains.

It may be reasonable to suggest that some investors have been heavily involved in fossil fuels in the longer term. Consequently, it may take longer to divest, or the will to divest is non-existent based on the ongoing lucrative returns. This narrative can be an influential factor in investors' decision-making, as Klenert et al. (2020) posited when they highlighted vested interests in outcomes from ongoing involvement in fossil fuel projects as a challenge in decision-making.

It would have been an encouraging state of affairs if vested interests were reduced due to limited opportunities for exposure to GHG-related projects. Unfortunately, banks' increasing fossil fuel financing provides fertile ground for continued investments. A common contention is that numerous banks continue increasing their exposure to climate-risk areas (Bai, 2011). It would seem, therefore, that investors will continue to have opportunities to fund banks that will fund polluters.

Immense risks show up when the markets do not seem to pay attention to climatic issues. Some reasons for such scenarios could be driven by socio-political influences whereby the reporting of climatic risks is subdued. This seems to be the case where dependency on fossil fuels is seen as irreplaceable, and any attempts to change the status quo could be seen as a way of triggering issues

such as unemployment and poverty. Monasterolo and De Angelis (2020) summed it up when they reported that seemingly stock markets are hardly moved by the financial economics of carbon-intensive indices.

Investors are, however, fortunate in that there is an overwhelming interest in the news pertaining to climate risks in all its forms, which may be used in decision-making. One important global event which triggers climate-related news in and around its holding is the COPs.

It would seem that, by virtue of their established climate agenda, the COPs provide a platform from which climate news can be effectively disseminated, particularly as each symposium approaches, during the symposium and immediately after its conclusion. Taking its mandate from the United Nations Framework Convention on Climate Change (UNFCCC), the COPs provide a platform for countries to collectively rein in carbon emissions by entering into contractually recognised agreements (Hopke & Hestres, 2018). Evidence of efforts to address climate risks manifests themselves in the staging of the different symposiums. COP21 laid the foundation for a net zero GHG emission target by 2050 (Hopke & Hestres, 2018). The foundation was well established, considering that it involved 196 nations, all of which agreed to the legally binding nature of the agreement to prevent any efforts to increase temperatures to above 1.5 degrees Celsius above preindustrial levels.

Thereafter, COP 22 was designed to ensure the success of COP 21, demonstrating that the founding principles were resolute. COP 22 reinforced and worked towards progressing the Paris Agreement (Balibar, 2017). Since it was a reinforcement platform, it meant that climate change remained core to the discourse at the conference. One can conclude that the main news in and around the conference concerned what it would mean to address climatic challenges.

Even though the themes slightly changed progressively, the main agenda did not change. Like COP22, COP23 centred on putting together rules for applying the Paris Agreement, all geared towards curbing GHG emissions (Obergassel et al., 2018). This was a demonstration of a commitment to see a successful implementation of what was agreed upon right from the beginning. An orderly way of addressing climate change was necessary.

Rules could not work without key performance indicators. Hence COP 24 was a platform to devise measurement and reporting principles on climate emissions. Key to COP24 was the ratification of decisions to implement the Paris Agreement comprehensively (Asadnabizadeh, 2019). This action further cemented the commitment of all concerned to see the successful implementation of rules and regulations.

The manifestation of the need to consider life above and below water is of great importance. Such was the wider impact of the COPs. The COP 26 climate summit focused on efforts to bring the ocean into the mainstream of adaptation and mitigation of climate changers (Lennan & Morgera, 2022). Hence, the COPs intended to cover all environmental and ecological issues.

Evidence of climate news filtering around the COPs is not difficult to interpret. Amongst other observations, the Durban conference was attended by 1,200 media personalities (Banerjee, 2012). Such a high number of news reporters was very significant. It meant that coverage and dissemination of climate news were adequate. It would, by implication, mean that there was bound to be a degree of anticipation as to what the next COP had to deliver for participating countries and organisations.

Indeed, the presence of media personnel could not have taken place in the absence of climate activists. Such interactions are a recipe for news generation and dissemination. The heightened climate activism witnessed before COP 15 was largely accompanied by equally heightened international media attention leading up to and during the climate talks (Hopke & Hestres, 2018).

In analyzing media coverage of climate change, Schäfer and Schlichting (2014) and Schmidt et al. (2016) concluded that the media is the principal source of information to the public and institutions pertaining to climate change. Consequently, it is the media's role to report the news. However, it is the public's role to make sense of the news and make appropriate decisions.

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Media attention is, however, not consistent from one conference to the other. Schmidt et al. (2016) reported the non-linearity of media attention, citing the occurrence of high peaks in media attention and implication on news dissemination around the COPs highlighting COPs 3, 6 and 13 as some of the examples. Indeed, there is an absorbing interest in climate news in and around the COPs.

Overall, reporting around the COPs can be appropriately described as event reporting since it covers mostly discussions and present activities. In Wozniak et al.'s (2021) account, event-focused reporting takes center stage based on a newspaper content analysis on climate change, such as the one involving Germany, India, South Africa, and the United States. Regardless of where the event is hosted, the COPs tend to provide fertile ground for cross-national media influences (Wozniak et al., 2021). An illustration of the all-round coverage of climate change news around the COPs was provided by Wozniak et al. (2021) when they reflected a substantial increase in media coverage as the COPs happened as well as even greater coverage (the United States and India) after COP21 than before it commenced. This leads to the all-important conclusion that investors can decide in the period, during COPs and after COPs based on news filtered around the particular symposium.

It is not a matter of which frame is used as we believe that all frames can impact investors' choices and subsequent flow of funds. Prompted by the Dutch and French climate change coverage during the annual UN COPs, citing McCombs et al. (1997), Dirikx and Gelders (2010) suggested that the public can use frames to determine why an issue is important, whose responsibility it is and what could be the consequences.

This study considers the public to include the investing public. Even when citing the UNFCC (n.d.) in an attempt to bring the issue of urgency in dealing with climate change, Hopke and Hestres (2018) highlighted the need to recognize that parties may be negatively affected by the consequences of the changes. Investors should be a component of the parties likely to be affected by the consequences of climate change. Regardless of which frame is encountered in the news preceding, during and following the COPs, bank investors' attitudes and behaviors can be tracked using the demand for the banking shares and swings in investor holding periods.

Holding periods, like share prices, are subjected to fluctuations, such as daily, weekly, monthly and even yearly. The swings in holding periods could be attributed to various reasons. Pilatin (2022) disclosed that the decrease in holding periods could be because many domestic investors with low financial literacy decide to venture into stock markets. In this instance, herd behavior is observed because participation is not based on sound financial fundamentals.

Another determining factor pertains to reactionary modes. In the presence of specific news, investors can overreact or underreact (Dhankar & Maheshwari, 2014; Chang et al., 2018). However, overreaction or underreaction, as reflected in the holding period lengths, would give stakeholders in climate-related matters an idea of investors' direction toward banks increasing financing of fossil fuel projects.

It is also pertinent to deduce the relevance of holding periods in the acknowledgement by Chakrabarty et al. (2013) that institutional trade holding periods could indicate how investors think and behave in investigating what they regard as optimal portfolios for different holding periods. Another telling scenario surrounding the relevance of a holding period pertains to the risk-horizon concept. This can be deduced from such combinations as concentrations of riskier assets and subsequent holding periods. This entails that the riskier the allocations, the more difficult it is to dispose of them and the longer the ensuing holding period. Choi and Mukherji (2010) established that the increase in investment horizon corresponded to more allocations of riskier assets and an accompanying reduction in safer assets. However, this concept seems to work in the presence of skilled or well-informed investors.

Market volatility resulting from price fluctuations is a concern, given that only expected levels of certainty in returns represent a low risk to investors. After gathering information and analysing it, investors make decisions based on several dynam-

ics such as over-confidence, pride and regret, disposition and endowment effect (Nofsinger, 2017), which can trigger market volatility.

It is, therefore, important to establish the impact of climatic news on the volatility of bank shares. Smales (2015) described a significant asymmetrical impact on volatility, with negative news having a significantly greater impact than positive news on gold shares. Could the same be implied with banking shares whose affinity towards GHG polluters is rising unabatedly? Such impacts and the apparent connotations that heightened news coverage do not necessarily transform into positive actions since detriments such as biased disposition and outright incomprehension of risk can manifest.

This leads to the purpose of this study: To establish the impact of climate news on investment decisions involving banks' intensified financing of fossil fuel projects and to recommend appropriate remedies.

2. METHOD

Data on identified banks deemed the highest financiers of CO_2 emission activities was collected from publicly available consumer news and business channel websites. Historical 7-year share price data based on monthly frequencies were collected from two (2) renowned publicly listed financial databases, Macrotrends and Companies' market cap websites. From this data, demand based on monthly share price changes was determined. The rate of changes in share prices for the month leading to the conferences of parties to the month in which the conference took place and to the month after the conference were computed. Monthly holding periods covering periods 2015 to 2021 were computed using a Microsoft Excel spreadsheet and the following formula:

$$Average\ holding\ period\ (in\ months) = \frac{12\ months}{Average\ annual\ turnover\ rate}, \quad (1)$$

where *Average annual turnover rate* represents the percentage rate at which shares change ownership over a year.

The turnover ratio was computed from the value of shares traded divided by their market capitalisation.

$$Turnover\ ratio\ period = \frac{Value\ of\ shares\ traded}{Market\ capitalisation}, \quad (2)$$

where *Value of shares traded* represents the sum of shares traded multiplied by their market prices. *Market capitalization* denotes the total value of a company's publicly traded outstanding shares.

Data for changes in holding periods relating to three (3) months encompassing a month before COP, the month of the COP and a month after the COP were extracted from the computations above. Desriptive analysis of frequencies relating to patterns in demand and holding periods were determined leading into the COPs and immediately after. All cases with the same patterns were aggregated and proportionated to establish the most occurring patterns. The most statistically significant relationships between demand and holding periods were also determined across the seven (7) years. Linear regression was done in Microsoft Excel to determine the Pearson r and its significance. A comparison of behavioural trends based on demand and holding periods between Europe and Asia was conducted.

Furthermore, the computed three (3) months of price volatilities over the seven-year (7) period of the European and Asian shares were subjected to comparisons to determine risk. Lastly, a two-sample t-test was employed to determine the difference between the means of return volatilities of the two (2) sets of banking groups in Europe and Asia. The commensurate link to the investors' reactions to the symposium climate news was determined. The results are described in the next section.

3. RESULTS

Figure 1 presents cases about the relationships between holding periods and demand before the COPs.

It is evident that in the periods before the COPs, the highest occurrence in the decrease in holding

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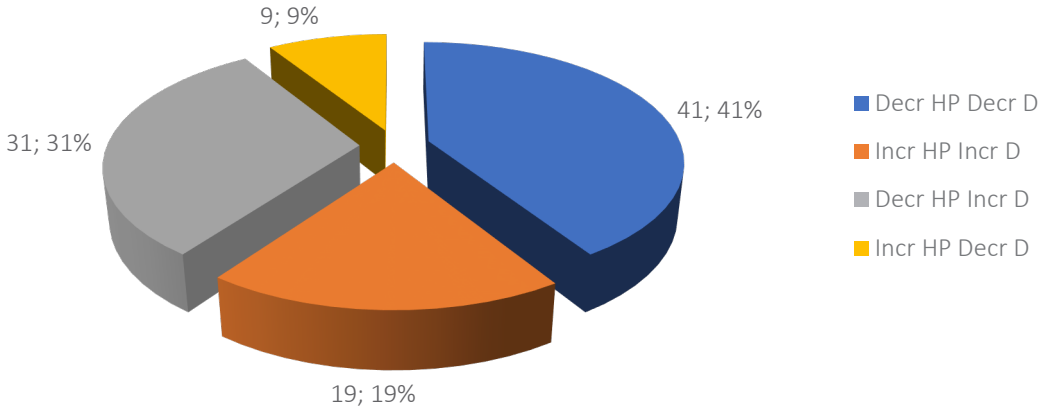

Figure 1. Europe before COPs

periods corresponds to a decrease in the demand for those riskier bank shares. On the extreme end, the few increases in the holding period also correspond to a decrease in demand. The overwhelming decrease in demand and holding periods was favourable and meant investors were discouraged by climate news dominant before the conference. Alertness triggered by news filtering before the symposiums was partly responsible for that favourable response.

Figure 2 depicts the combination of demand and holding periods relationship frequencies after the COPs.

There is a concerning increase in the holding period, which directly corresponds to increased demand for the bank shares that are increasing fossil-fuel financing. It is only at the very least (13%) whereby there seems to be a downward trend in demand. Both moves are disconcerting since they partly support the riskier bank shares. It means news during and after the COPs somehow encouraged investors to seek more shares of these riskier banks.

Figure 3 displays the Asian investors' behavioural trends before the COPs.

The scenario depicts different trends altogether from those witnessed in Europe. Firstly, the majority of cases indicate a decrease in the holding period. However, this short-term period has a correspondingly high demand for bank shares. However, very close to that pattern is an encouraging aspect dominated by decreased demand even though holding periods increased. The predominant rise in demand which could be the reason for the reduced holding period, is not a welcome move as it indicates a willingness to fund the riskier banks. News before the COPs in Asia does not provide a deterrent mechanism to investors.

In Figure 4, a portrayal of how investors behave in terms of demand and holding periods in Asia after the COPs is presented.

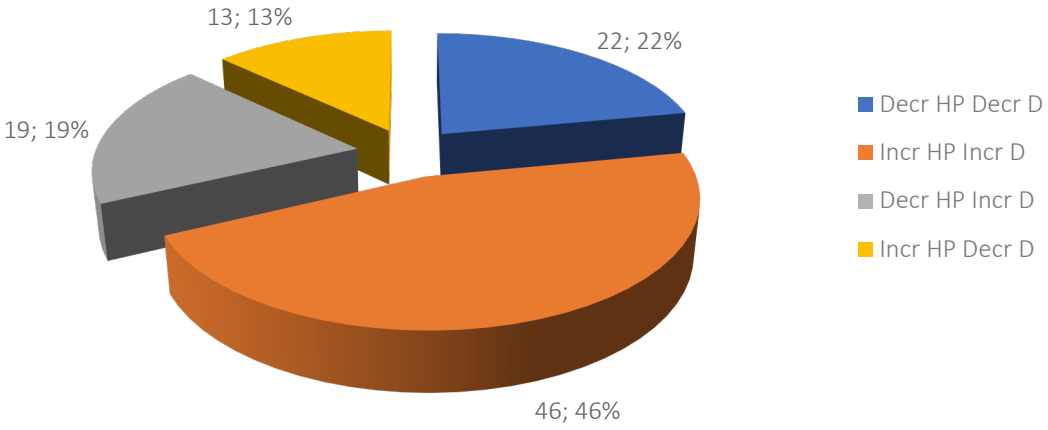

Figure 2. Europe after COPs

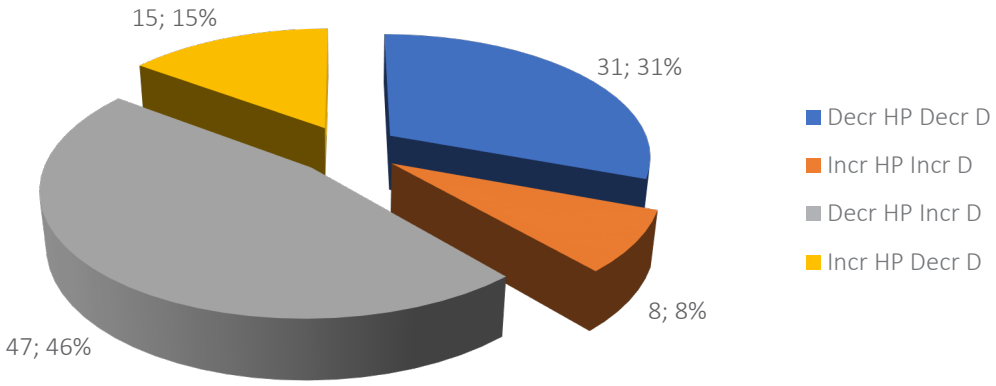

Figure 3. Asia before COPs

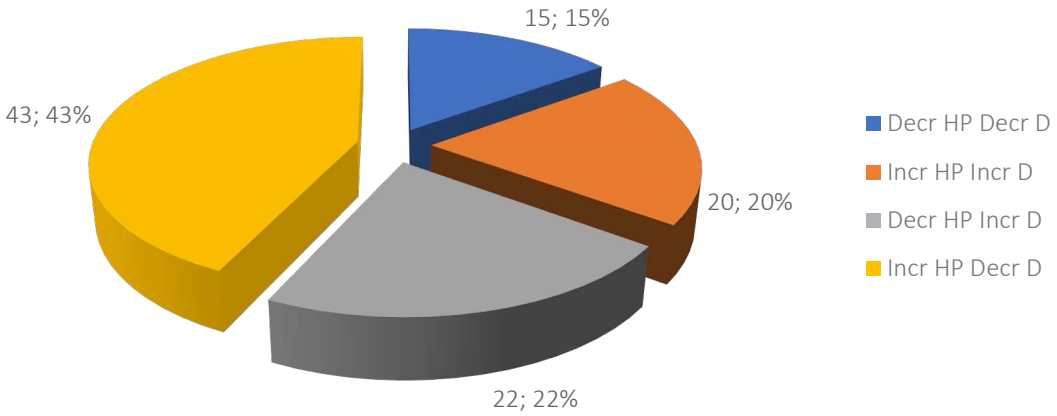

Figure 4. Asia after COPs

Unlike Europe, Asia sees a substantial increase in holding periods after the COPs, accompanied by a corresponding decrease in demand. The least frequency is demonstrated through a decrease in the holding period corresponding to a much appreciable decrease in demand for bank shares. A positive reduced appetite for the riskier shares is witnessed in Asia, reflecting an influence of news delivered during and after the COPs to the negative consequences of continuously channelling funds towards GHG enablers.

Linear regression tests the strength of the relationship between demand and holding periods. The statistical significance of Pearson r is also established. To establish if the relationships (correlations) of the extreme cases in each phase were statistically significant, the corresponding t-scores and p-values were calculated.

Firstly, the obtained t value is calculated using the formula:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}, \quad (3)$$

where the degrees of freedom is equal to $n-2$ for which n is the number of subjects in the sample. r is the Pearson r as an index.

The p-value is calculated as two-sided for the t-distribution, using n–2 degrees of freedom. In this linear relationship H_0 predicts that no relationship exists, $p = 0.00$. Table 1 portrays the outcomes.

Table 1 shows that the most frequently observed relationship in Europe is in the period leading to the COPs, representing a decrease in holding periods with an accompanying decrease in demand for bank shares promoting GHG financing is weak with a Pearson r of 0.10. The obtained t-static is lesser than the critical T-value. Hence the relationship is insignificant at $p > 0.05$, and the null hypothesis H_0 cannot be rejected. After the COPs, a weak negative relationship (–0.25) is observed

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Table 1. Linear relationship and inferential statistics

Measure	Europe before COPs	Europe after COPs	Asia before COPs	Asia after COPs
R	0.104949	–0.25434	0.014322	0.033102
Sample size (n)	26	32	29	26
Test statistic t	0.51699	–1.44043	0.0744419	0.162257
Critical value T	2.06399	2.04227	2.05183	2.06399
Alpha	0.05	0.05	0.05	0.05
TvsT	t < T	t < T	t < T	t < T
P value	P, 0.61 > 0.05	P, 0.16 > 0.05	P, 0.94 > 0.05	P, 0.16 > 0.05

in which holding periods and demand increase. However, in this instance, the null hypothesis H_0 cannot be rejected at p > 0.05, reflecting an insignificant relationship.

In Asia, before the COPs, the highest frequency in relationships occurred when holding periods decreased whilst demand increased. It is also noted that this relationship is very weak at r = 0.014 and insignificant at p > 0.05. Lastly, it is after the COPs whereby another very weak relationship occurs, with demand decreasing whilst holding periods increase. However, like in Europe, there is insignificance at p > 0.05. In all instances, the relationship is weak and statistically insignificant. This implies the need to look at the individual implications of investor demand, indicating investor appetite for the riskier shares independent of the period between the purchase and sale of a security.

To compare the means of the price volatilities of the two (2) banking groups' investors, it was deemed fit to utilise the two-sample *t*-test (Table 2). The null hypothesis tested is that the two (2) populations' means are equal $\left(\text{i.e. } H_0 : \mu_1 = \mu_2\right)$. The alternative hypothesis is that the means are not equal $\left(H_2 : \mu_1 \neq \mu_2\right)$.

Table 2. Two-sample t-test

t-Test: Two-Sample Assuming Equal Variances		
Measure	**Europe**	**Asia**
Mean	0.439871	0.067472
Variance	0.776256	0.855165
Observations pooled	123	105
Hypothesised mean difference	0	
Df	226	
t Stat	3.109269	
P(T < = t) one-tail	0.001058	
t critical one tail	1.651624	
P(T < = t) two-tail	0.002117	
t critical two tail	1.970516	

The output indicates that the mean for Europe is 0.439871, and Asia's is 0.067472. The variances are not exactly equal but are close enough to assume equal variances. Using the two-tailed results, the p-value 0.002117 is less than the significance level of 0.05. Therefore, we can reject the null hypothesis. The sample data support the hypothesis that the population means are different. Europe's volatility mean of 0.44 is greater than the Asian volatility mean of 0.07. This outcome signifies more risk in European banks that are increasing fossil fuel financing than their Asian counterparts. Volatility is an ideal indicator of risk in analysing financial investments.

4. DISCUSSION

The results are discussed based on investors' behavioral manifestations within the context of climate news surrounding the COPs symposiums. The discussion began with highlighting the decision-making attitudes of investors through the demand aspect of banking shares under study. In Europe, demand seems to be in balance in the period leading to the COPs. Almost 50% of the cases show that demand increases just before the symposiums occur. In Asia, the pattern seems similar to Europe before the COPs. However, about 55% of cases reflect a substantial increase in demand for the riskier bank shares. It is of concern to note that even though slightly better than before the COPs, investors' alert to climate risks, as covered in the news during the COPs, remains low, with almost 67% of cases reflecting continued demand in Europe. This scenario can be likened to Campiglio et al. (2018) viewpoint about investors' outright lack of appreciation for the degree of exposure pertaining to their investments. Equally, it can be attributed to a narrow-based disposition and remarkable ineffectiveness in evaluating cli-

matic risks (Condon, 2021). An encouraging trend reflects in Asia after the COPs, with demand decreasing by almost 58%. Therefore, it would seem that news during the symposium in Asia influences investors to rethink their decision-making and helps reduce their appetite towards riskier banks. The appeal by UNFCC, cited by Hopke and Hestres (2018), for investors to pay attention to climate news due to the likelihood of parties being affected not only by climate change but also by the impacts of measures taken in response to it seems to be heeded more by investors in Asia than in Europe after the COPs.

Adding the aspect of investor holding periods, it is evident that in Europe before the COPs, the most frequent observation pertains to the combination that sees decreases in holding periods as the demand for shares decreases (41%). This would seemingly suggest that as the demand of the riskier banks in terms of GHG financing is concerned, investors would also want to let go of their shares. In Asia before the COPs, the most observed relationship sees a decrease in holding periods, but as demand increased which is a reversal what is observed in Europe. The increased appetite for bank shares seems to influence short-term horizons in holding periods. After the COPs, Europe's case is completely different from those discussed thus far. The frequent corresponding trend pertains to increases in demand followed by increases in holding periods.

Demand seemingly encourages some investors to cling to their investments regardless of the news sensitivity from the conference. This combination is not welcome, even though it is statistically insignificant since interest in the ongoing investments in the riskier banks is evident in both situations. Justifiably, such a scenario through the banks' ability to continue financing fossil fuel projects may intensify the feared rise in global temperatures, which, in turn, as postulated by Durrani et al. (2020), may cause turmoil which may include sickness, displacements and even loss of life. However, in Asia, the encouraging majority of cases that sees a decline in demand for banking shares after the COPs are associated with increases in holding periods. It may result from various reasons, one of which could be from the non-availability of buyers to purchase the bank shares and manifesting in lengthy holding periods.

Most pertinently, Europe's frequent trend, which pertains to increases in demand followed by increases in holding periods, reflects a mild but positive relationship that is statistically insignificant. Substantively, this trend discourages mitigating climate risks considering the extent to which European banks are involved in fossil fuel projects. Perhaps a strategy by authorities such as the one highlighted by Kress (2022) concerning the intervention by rating agencies in downgrading heavily exposed banks is necessary to assist investors in decision-making. More effort is required from all stakeholders to ensure an alignment with global efforts. However, the relationship between demand and holding periods that reflects in Asia after the COPs is also weak but statistically insignificant. Even though the demand-holding period relationships appear to be statistically insignificant, there are more positives out of Asia because it would seem investors are persuaded by climate news from a demand standpoint during the COPs and becoming cautious thereafter.

The statistical insignificance in all relationships makes sense if one considers the unpredictability of holding periods. Many reasons could be attributable to the non-rejection of the null hypothesis that no linear relationship exists between demand and holding period. Underreaction by those already holding the shares can result in short or long-term holding periods (Chang et al., 2018). Herd behaviour demonstrated by those who lack the know-how to detect the riskiness of investments in fossil-fuel projects (Pilatin, 2022) could explain the lack of statistical significance. Irrationality on the part of investors in respect of climate risks seems to be one of the driving factors. Considering the more dominant demand factor, more efforts by all stakeholders to conscientious investors can yield quicker and better progress in Asia than in Europe.

The substantive significance also extends to the volatility means of the two (2) continents, with Europe's volatility mean of 0.44 greater than the Asian volatility mean of 0.07. The implication is that in the short-term, the markets' reaction to banks inclined to support fossil fuel projects not mild in Europe, thereby distinguishing the European markets' reaction from most carbon-intensive indices referred to by Monasterolo and

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De Angelis (2020). Asian mild market's reaction, as captured in low volatility, resembles most carbon-intensive indices (Monasterolo & de Angelis, 2020). Since volatility implies risk, it follows that the risk influenced by the news around the COPs in returns of investments linked to banks increasingly financing fossil fuel projects is more in Europe than in Asia. In totality, there seem to be more climate-related news reactionary challenges in Europe than in Asia in the short-term periods in and around the COPs. However, investors need to note that this risk is diversifiable and with a deliberate strategy to diversify the flow of funds with particular emphasis towards greener initiatives, the risk factor of European banks can be mitigated.

CONCLUSION

The study aimed to ascertain the influence of climate news on investment choices concerning banks that are intensifying fossil fuel project financing and to recommend suitable solutions. The dominance of investor sensitivity to climate news regarding banks insensitive to fossil fuel financing appears stronger in Asia than in Europe. In the wake of the uncertainty regarding climatic events, rationality to news filtering should occur despite the news framing type or manner. More cases ending with reduced investments towards banks supporting fossil fuel financing can be seen in Asia after the COPs, even though cases of the opposite nature showing an upward shift in investments after the COPs are in excess in Europe. Postures that display irrationality are fewer in Asia and can seemingly be reduced further, considering that, in relative terms, more investors in Asia than Europe have demonstrated behaviours compatible with conscious awareness of climatic news, particularly in periods after COPs.

A clear distinction in commensurate returns volatility between the two (2) continents resonates with the different degrees and magnitudes of affinities towards fossil fuel financingbanks by different investors. The encapsulating defining conclusion is that, progressively, news of climatic risks for investments in high financiers of fossil fuel projects seems to be triggering the right reactions in Asia. At the same time, Europe needs to do more to mitigate the situation. Tightened regulatory restrictions in the form of substantial downgrades for climate-related insensitive banks, including publicized climate Global blacklisting, is necessary since investments are largely not geographically restricted but transcend geographical boundaries. Furthermore, a global index for the banks identified as accelerating fossil fuel financing should be established and publicised annually with a ranking order from the most culprit to the least culprit. All three (3) initiatives should be incorporated as part of the COPs either for discussions or for mere exposure. The initiatives could form part of the climate news in and around the COPs. This will further influence investors in their decision-making process. The banks may be persuaded to redirect the flow of funds to greener activities once they are constrained with high cost of capital levels and reputational damages associated with fossil fuel financing activities.

However, the study is centred on the short-term investment horizons and the statistical insignificance of the relationships between investor demand and holding periods provides a necessity for further research. An investigation on long-term investment horizons to establish the extent of investor rationality regarding banks that are increasing fossil-fuel financing would be beneficial.

AUTHOR CONTRIBUTIONS

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REFERENCES

1. Andersson, M., Bolton, P., & Samama, F. (2016). Hedging Climate Risk. *Financial Analysts Journal, 72*(3), 13-32. https://doi.org/10.2469/faj.v72.n3.4
2. Asadnabizadeh, M. (2019). Analysis of Internal Factors of the Swing States in the International Climate Change Negotiations: A Case Study of Poland in COP24. *American Journal of Climate Change, 08*(02), 263-283. https://doi.org/10.4236/ajcc.2019.82015
3. Bai, Y. (2011). *Financing a Green Future: An Examination of China's Banking Sector for Green Finance* (Thesis). Lund University.
4. Balibar, S. (2017). Energy transitions after COP21 and 22. *Comptes Rendus Physique, 18*(7-8), 479-487. https://doi.org/10.1016/j.crhy.2017.10.003
5. Banerjee, S. B. (2012). A Climate for Change? Critical Reflections on the Durban United Nations Climate Change Conference. *Organization Studies, 33*(12), 1761-1786. https://doi.org/10.1177/0170840612464609
6. Campiglio, E., Dafermos, Y., Monnin, P., Ryan-Collins, J., Schotten, G., & Tanaka, M. (2018). Climate change challenges for central banks and financial regulators. *Nature Climate Change, 8*(6), 462-468. Nature Publishing Group. https://doi.org/10.1038/s41558-018-0175-0
7. Chakrabarty, B., Moulton, P. C., Trzcinka, C., Anand, A., Bailey, W., Battalio, R., Ben-Rephael, A., Goncalves-Pinto, L., Harris, J., Holden, C., Irvine, P., Jain, R., Jennings, B., Lerner, P., Ma, Q., O'hara, M., Obizhaeva, A., Patel, A., Saar, G., … Wermers, R. (2013). Institutional Holding Periods. *Journal of Financial and Quantitative Analysis (JFQA),* 1-52. https://dx.doi.org/10.2139/ssrn.2217588
8. Chang, R. P., Ko, K. C., Nakano, S., & Ghon Rhee, S. (2018). Residual momentum in Japan. *Journal of Empirical Finance, 45,* 283-299. https://doi.org/10.1016/j.jempfin.2017.11.005
9. Choi, P., & Mukherji, S. (2010). Optimal Portfolios For Different Holding Periods. *Journal of Business & Economics Research, 8*(10), 1-6. https://doi.org/10.19030/jber.v8i10.768
10. Climate Watch Historical GHG Emissions Data. (2022). *Climate Watch.* Retrieved from https://www.climatewatchdata.org/ghg-emissions
11. Condon, M. (2021). Market Myopia's Climate Bubble. *Utah Law Review, 63,* 1-65. Retrieved from https://scholarship.law.bu.edu/faculty_scholarship/1087
12. Cullen, J. (2018). After "HLEG": EU Banks, Climate Change Abatement and the Precautionary Principle. *Cambridge Yearbook of European Legal Studies, 20,* 61-87. https://doi.org/10.1017/cel.2018.7
13. Dhankar, R. S., & Maheshwari, S. (2014). A Study of Contrarian and Momentum Profits in Indian Stock Market. *International Journal of Financial Management, 4*(2). Retrieved from http://www.publishingindia.com
14. Dirikx, A., & Gelders, D. (2010). To Frame is to Explain: A Deductive Frame-analysis of Dutch and French Climate Change Coverage during the Annual UN Conferences of the Parties. *Public Understanding of Science, 19*(6), 732-742. http://dx.doi.org/10.1177/0963662509352044
15. Durrani, A., Rosmin, M., & Volz, U. (2020). The Role of Central Banks in Scaling Up Sustainable Finance – What Do Monetary Authorities in the Asia-Pacific Region Think? *Journal of Sustainable Finance and Investment, 10*(2), 92-112. https://doi.org/10.1080/20430795.2020.1715095
16. Hopke, J. E., & Hestres, L. E. (2018). Visualizing the Paris Climate Talks on Twitter: Media and Climate Stakeholder Visual Social Media During COP21. *Social Media and Society, 4*(3). https://doi.org/10.1177/2056305118782687
17. Klenert, D., Funke, F., Mattauch, L., & O'Callaghan, B. (2020). Five Lessons from COVID-19 for Advancing Climate Change Mitigation. *Environmental and Resource Economics, 76*(4), 751-778. https://doi.org/10.1007/s10640-020-00453-w
18. Kress, J. C. (2022). Banking's Climate Conundrum. *American Business Law Journal, 59*(4), 679-724. https://doi.org/10.1111/ablj.12217
19. Lennan, M., & Morgera, E. (2022). The Glasgow Climate Conference (COP26). International *Journal of Marine and Coastal Law, 37*(1), 137-151. https://doi.org/10.1163/15718085-bja10083
20. Lück, J., Wozniak, A., & Wessler, H. (2016). Networks of Coproduction: How Journalists and Environmental NGOs Create Common Interpretations of the UN Climate Change Conferences. *The International Journal of Press/Politics, 21*(1), 25-47. https://doi.org/10.1177/1940161215612204
21. Monasterolo, I., & De Angelis, L. (2020). Blind to Carbon Risk? An Analysis of Stock Market Reaction to the Paris Agreement.

http://dx.doi.org/10.21511/imfi.21(1).2024.15

Ecological Economics, 170, 106571. https://doi.org/10.1016/j.ecolecon.2019.106571

22. Nofsinger, J. R. (2017). *The Psychology of Investing* (6th ed.). Routledge.

23. Obergassel, W., Arens, C., Hermwille, L., Kreibich, N., Mersmann, F., Ott, H. E., & Wang-Helmreich, H. (2018). *The Calm Before the Storm: An Assessment of the 23rd Climate Change.* Retrieved from https://wupperinst.org/fa/redaktion/downloads/publications/COP23-Report.pdf

24. OCI team. (2023) *Banking on climate chaos: Fossil fuel financing.* Retrieved from https://priceofoil.org/2023/04/13/banking-on-climate-chaos-2023/

25. Park, H., & Kim, J. D. (2020). Transition Towards Green Banking: Role of Financial Regulators and Financial Institutions. *Asian Journal of Sustainability and Social Responsibility, 5*(1). https://doi.org/10.1186/s41180-020-00034-3

26. Pilatin, A. (2022). In the Context of behavioral Finance, Do Investor Characteristics Affect Stock Holding Period? *KAÜİİBFD, 13*(25), 244-266. https://doi.org/10.36543/kauiibfd.2022.011

27. Punzi, M. T. (2019). Role of Bank Lending in Financing Green-Projects. In *Handbook of Green Finance* (pp. 237–259). Asian Development Bank Institute.

28. Ritter, R. (2022). Banking Sector Exposures to Climate Risks: Overview of Transition Risks in the Hungarian Corporate Loan Portfolio. *Financial and Economic Review, 21*(1), 32-55. https://doi.org/10.33893/fer.21.1.32

29. Schäfer, M. S., & Schlichting, I. (2014). Media Representations of Climate Change: A Meta-analysis of the Research Field. *Environmental Communication, 8*(2), 142-160. https://doi.org/10.1080/17524032.2014.914050

30. Schmidt, A., Ivanova, A., & Schäfer, M. S. (2016). Media Attention for Climate Change around the World: A Comparative Analysis of Newspaper Coverage in 27 Countries. *Global Environmental Change, 23*(5), 1233-1248. https://doi.org/10.1016/j.gloenvcha.2013.07.020

31. SGK Planet. (2023). *FAQs about the COP, Conference of the Parties.* Retrieved from https://sgkplanet.com/en/what-are-the-objectives-of-the-cop/

32. Smales, L. A. (2015). Asymmetric volatility response to news sentiment in gold futures. *Journal of International Financial Markets, Institutions and Money, 34,* 161-172. https://doi.org/10.1016/j.intfin.2014.11.001

33. Wessler, H., Wozniak, A., Hofer, L., & Lück, J. (2016). Global Multimodal News Frames on Climate Change: A Comparison of Five Democracies around the World. *The International Journal of Press/Politics, 21*(4), 423-445. https://doi.org/https://doi.org/10.1177/1940161216661848

34. Wozniak, A., Wessler, H., Chan, C.-H., & Lück, J. (2021). The Event-Centered Nature of Global Public Spheres: The UN Climate Change Conferences, Fridays for Future, and the (Limited) Transnationalization of Media Debates. *International Journal of Communication, 15,* 688-714. Retrieved from http://ijoc.org