**5.Results**

**Descriptive analysis**

Table 1 presents the descriptive statistics namely median, standard deviation, minimum and maximum, IQR and total number of observations of the employed variables for the whole US market and for every industry separately during normal times and during the pre-defined crisis periods.

Table 2 reports the ordinary least squares results of Equation (2) employing the US industry returns both at aggregate level and at an industry level. Table 2 is divided into three separate panels: the top panel presents estimated coefficients of Equation (2) employing all days for the whole period of analysis while the middle panel presents the estimation results only for the top market returns and the bottom panel the relevant estimates during the down markets. Herding is detected examining the statistical significance and the sign of coefficient γ2 that can be found at the last column. When herding is present, γ2 assumes negative sign and appears statistically significant. A quick look of the results in Table 2 reveals no herding behavior when we use all day returns but significant herding effects for the whole sample and for separate sectors such as Consumables, Health and Other only during up markets. For example, in the middle panel and at the last column for Consumables we see a herding coefficient γ2 of -0.00016 that is highly significant. If we turn our attention to the bottom panel we document weak evidence of herding effects in the Manufacturing sector, an estimated value of γ2 coefficient -0.00006 that is statistically significant at 10%.

Following previous studies that highlight the dynamic nature of herding effect (see Klein, 2013, Babalos et al., 2015, Mohamad & Stavroyiannis, 2022) we have estimated Equation (2) using a rolling window estimation period of 250 days for the whole period of analysis. Figure 1 presents the graphical illustration of the results. In particular, we can see the time evolution of the t-statistic of the estimated coefficients with the t statistic of γ2 being at the epicenter of our focus. Contrary to previous findings using the static approach, the rolling window analysis reveals substantial herding effects for the whole market (All industries) and for a number of industries during various time points.

Table 3 reports the ordinary least squares results of Equation (2) employing the US industry returns both at aggregate level and at an industry level during the pre-defined four crises periods: the Great Depression, Dot-com Bubble, Great Financial Crisis and the health crisis of covid. As stated earlier, herding during crisis periods is verified by means of the sign of the estimated coefficient γ3. The results point to the existence of significant herding effects for all industries employed during the four crisis periods. In particular, during the Great Depression herding is present when we employ All industries while across industries we document herding in three out of five industries namely Business services, Consumables and Other display strong herding effects. Health industry displays weak evidence of positive or anti-herding behavior (reference maybe here). Herding persists for all industries during the other four crisis periods.

Figures 2-5 plot the results of the rolling window estimation of 250 days for Equation (3) during the above mentioned crisis periods.

Following relevant literature that attempts to isolate intentional from spurious herding (Holmes et al., 2013 for institutional investors, Galariotis et al.,2015 for stock market investors) we estimate Equations (7) & (8) for the non-fundamental related and fundamental related Cross Sectional Absolute Deviation during non-crisis period. Table 4 presents the results of the estimated coefficients that capture the existence of intentional and spurious herding through the coefficient γ2 that is presented in the last column of Table 4. It is worth mentioning that herding on fundamentals is evident for the whole market and for three out of five industries namely Consumables, Manufacturing and Other. However, if we turn our attention to intentional herding, we observe no significant herding behavior across no industry or the market whatsoever. Figures 6-7 plot the time evolution of coefficients of interest along with the t-statistic using a 250-day rolling window analysis for fundamental and non-fundamental herding during non-crisis period.

Table 5 presents the results of herding on fundamental and non-fundamental information for US industries during the four crisis periods. The coefficient of interest is γ3 which in cases of negative and statistically significant reflects herding behavior. Observing the results of Table 5 some interesting findings emerge. Firstly, during the Great Depression investors appear to herd both on fundamental and non-fundamental information at market level. For industries, we document a unintentional herding across all industries during the Great Depression where intentional herding is evident only for Business Services, Consumable and Other. Secondly, a striking result refers to the behavior of investors in US industries during Dot com bubble. According to the estimated results, investors appear to herd only intentionally since the coefficient of interest γ3 appears negative and strongly statistically significant across all industries and the market as a whole. Moving more recently to the Global Financial Crisis (GFC), our results highlight substantial evidence of spurious and intentional herding for all industries and for the market as a whole. The only exception is the Business sector that displays no spurious herding during GFC. Our results are partly consistent with those reported by Galariotis et al. (2015) who documented only non-fundamental herding during subprime crisis for the whole market. However, we must be cautious with the comparison since the defined crisis periods might vary. Spurious and intentional herding of investors is also present during covid crisis period except for the Health industry that under the non-fundamental formulation we document an anti-herding behavior (Nath & Brooks,2020). Figures 8-11 plot the time evolution of the estimated coefficients of Equation (8) during the four crisis periods while Figures 12-15 present the behavior of the rolling window estimated coefficients for the non-fundamental herding equation.

Lastly, Table 6 presents the results of the estimated Equations (11) to (13) in an attempt to answer the question whether herding behavior across US industries is related to political cycles. The coefficient of interest λ1 assumes a positive and a statistically significant value when we measure overall herding for All Industries and three other Industries namely Consumables, Health and Other. This finding reflects a tendency of herding to be stronger when Democrats are in power while herding seems to diminish when Democrats are in power only for Business services. As an attempt to isolate overall to herding due to fundamentals and non-fundamentals we find that in the former case herding becomes stronger during Democratic administration for three out of five industries and for fundamental herding while in the latter case herding tends to be smaller when democratic party is in power for Business services, Manufacturing and Other. Pastor & Veronesi (2020) state convincingly: ‘when risk aversion is high, as during economic crises, voters are more likely to elect a Democratic president because they demand more social insurance. When risk aversion is low, voters are more likely to elect a Republican because they want to take more business risk. Therefore, risk aversion is higher under Democrats.’

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