
Comparison of the liquidity position between certified B Corp and non-B Corp companies during the COVID

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COMPARISON OF THE LIQUIDITY POSITION BETWEEN CERTIFIED B CORP AND NON-B CORP COMPANIES DURING THE COVID

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List of abbreviations

AUC: Area Under the ROC Curve.

CSP: Corporate Social Performance.

CSR: Corporate Social Responsibility.

ESG: Environment, Social and Governance.

GVIF: Generalized Variance Inflation Factor.

NACE: Nomenclature Statistique des Activités Economiques - Statistical Nomenclature of Economic Activities.

OFCE: Observatoire français des conjonctures économiques - French observatory of economic conditions.

ROC: Receiver Operating Characteristic.

SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2.

VIF: Variance Inflation Factor.

WHO: World Health Organization.

1. Introduction

On September 20th, 2023, the World Health Organisation Director-general, Dr. Tedros Adhanom Ghebreyesus saluted the commitments of world leaders for better cooperation, governance, and investment to prepare against future pandemics (WHO, 2023). This was in light with the COVID-19, whose impacts were devastating according to the Director-General. In those impacts, we could understand the people's health, but also the impacts on the economy around the globe, and especially on companies. In fact, the last crisis of this scale dates back to the Great Depression, according to Professor N. Roubini, who forecasted the crisis of 2008.

Indeed, during the period of the COVID-19, governments took the decision to close non-essential activities by establishing a lockdown. Such a lockdown cut off the sales and the activities of companies, leading them to cash shortages. Despite the closure of their activities, fixed costs remained, which represented a real challenge to finance when no more sales could be performed. In fact, a firm goes bankrupt when it is unable to pay its liabilities, and this is measured by the concept of 'liquidity'. Therefore, firms attempted to finance their fixed costs by using their existing credit lines (Almeida, 2020) and other means, in order to avoid the bankruptcy.

Thus, one question emerged from this challenge: does any protection exist for future pandemic/ lockdown? To do so, we will explore the notion of Corporate Social Responsibility (CSR), which, according to some authors (see Uyar et al., 2022 for instance), may have brought additional defences during the lockdown.

Through our research, we will discover that many effects emerged due to differences among organizations that have the role to rate *how much* a firm is engaged in CSR activities (Chatterji et al, 2020; Drempetic et al, 2019). To prevent such a ratter-effect, we decided to use the label B Corp. The label B Corp consists of a certification of the excellence of companies in their CSR engagement, by adopting a so-called *hybrid model*, where the company fulfil its financial need and a high CSR engagement at the same time.

Overall, we attempt to answer to the following hypothesis: certified B Corp companies had a better liquidity position during the COVID-19 era than non-B Corp companies. We will perform a linear regression of the liquidity ratios against the difference between certified B Corp and non-certified B Corp.

At our knowledge, we are the first paper to explore the cross section between the liquidity, COVID-19, and B Corp. The literature regarding B Corp companies has always been restricted on the number of certifications, due to their poor presence around the globe (a total of 6,131 certifications worldwide) and most papers have brought qualitative proofs. We will try to maximize the number of B Corp by performing a multi sectorial analysis. Our research focused initially on the Benelux region. However, constraints emerged from the Orbis database and obliged us to limit our scope to Belgian firms.

The following papers is divided as follows: section 2 will explore the scientific literature by analysing corporate liquidity, the COVID-19, CSR and their related cross-sections between each other. Section 3 will establish our main hypothesis while Section 4 will be dedicated to the design of our empirical study. Section 5 will present the results and Section 6 will discuss them. Finally, we conclude our paper by Section 7.

2. Literature Review

In this section, the exploration of the literature review is driven by the cross section of three main concepts: liquidity, the COVID-19 and the Corporate Social Responsibility (CSR). We will start by exploring the literature about liquidity, the related measurements available and the means of improvement. The second section of the literature review will explore the COVID-19 and the impacts on companies, especially in their liquidity position. Hereafter, we will explore the concept of CSR, its relationship with the two precedent concepts marginally and jointly. At the end of the third section of the literature review, we will discover a bias in the scientific literature, which made us take the decision to explore the concept of the label B Corp. We will attempt to legitimize the label in relation with the signalling theory, its certification process, and other fields. To offer a better view, we propose the viewer to stick to the following schema:

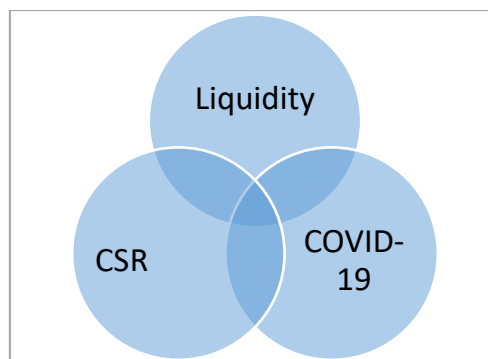


Fig 1: Literature review general structure.

Source: Made by us on Microsoft Word.

This schema represents the three concepts that we will develop in the literature review. In addition, the cross sections will be developed as we will continue through our exploration.

A. Liquidity

In this subsection, we will first explore the concept of liquidity. After, we will find how to measure such a concept in companies. Once the measurements are explored, managers can use tools or techniques to improve the liquidity of their firms. At the end of this subsection, we can explain the following part of the general structure of the schema:

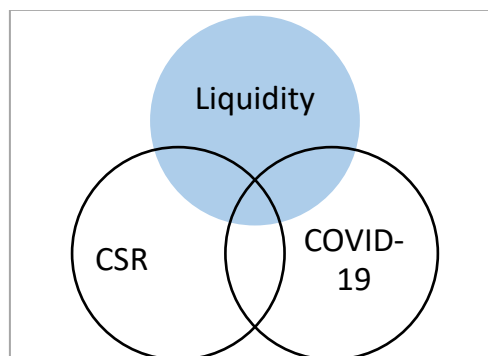


Fig 2: Advancement of the literature review.

Source: Made by us on Microsoft Word.

a) Definition of liquidity

The liquidity of a company is its ability to meet its short-term obligations. The liquidity is related to the portion of current assets able to finance the current liabilities (Almeida, 2020; Torsin, 2021). At the opposite, a company is illiquid when its liquidity is negative. Illiquidity does not lead necessary to bankruptcy but is due to an inferior amount of cash flow generation and cash holding¹ compared to fixed cost (Guerini et al., 2020). Illiquidity drives conflicts with many stakeholders such as suppliers, customers, banks, tax, and social institutions due to a difference of timeframe (Torsin, 2021). Indeed, firms with negative liquidity will attempt to extend their obligations (debts) over time while shortening their rights (claims). To give an example, financial liquidity is a condition to cover hospitals' costs, and additionally, the development and modernization of the equipment (Bern et al., 2014). At the end of the day, illiquidity may lead to insolvency, which in turns, may lead to bankruptcy (Demmou et al., 2021). Insolvency may appear under two forms: either the value of assets is lower than the value of liabilities, which is called balance sheet insolvency; or when the firm cannot meet its short-term obligations due to the absence of liquidity, which is called cash flow insolvency (Hristozov, 2021).

Liquidity might fulfil a need that we will classify as horizontal and vertical. The horizontal perspective is related to a transfer of financing ability from a geographical state to another one, while the vertical perspective is related to a transfer from a period to another. Thus, both are related to a transfer of a financing ability. To help the reader to visualise this process, we drew figure 3:

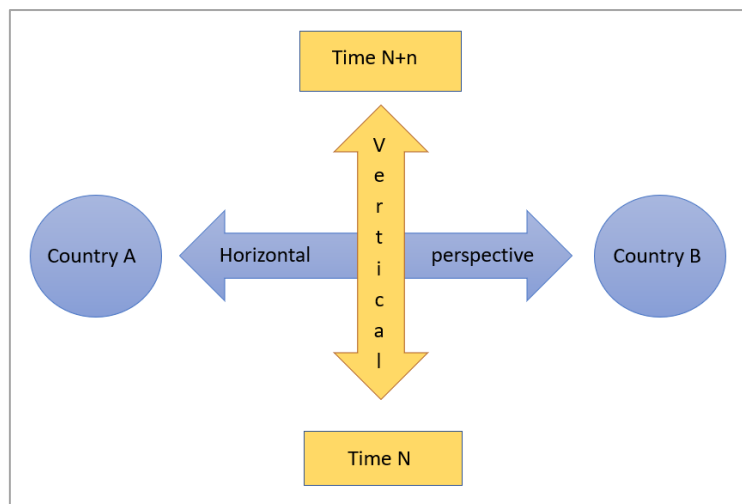


Figure 3: Type of perspectives for liquidity transfer.

Source: Made by us on Microsoft PowerPoint.

A first dimension to explore is the question of *why* managers should improve - or worsen - their liquidity position. Gill et al. (2011), referring to Isshaq et al. (2009), states that on one hand, firms do not adopt active liquidity management, and they are satisfied with passive management. But on the other hand, the author found opposite evidence by referring to Bruinshoofd et al. (2004). Indeed, managers consider corporate liquidity being driven by two objectives: a long-term and short-term target (Bruinshoofd et al., 2002). For this research, we decided to focus on the short run. In fact, the extend of our study is limited to the COVID era, which last from March 2020 to 2022 in Europe, and thus, may be seen as a short-term period. In this timeframe, executives manage liquidity for two

¹ Note: cash holding may be interpreted under two different perspectives: investor or corporate perspective. Under investor perspective, cash holding is considered as a mean for future action, actions that may profitable. Thus, the investor perspective account for the value of cash holding (Cheung, 2016). At the opposite, the corporate perspective see cash as a mean to buffer cash flow shocks (Almeida et al., 2014) and other risks.

purposes: mitigating cash flow [shocks] and investments expenditures (Bruinshoofd et al., 2002). Those purposes may also be summarised under the term of 'precautionary motive' (Chen et al., 2008).

The scientific literature has explored the importance of liquidity regarding product market interactions. At first, more liquid companies tend to acquire more market shares, with this effect being more pronounced if competitors struggle to have access to external fundings (Fresard, 2010). In the opposite, companies present in high-risk predation markets also tend to increase their liquidity, by savings or hedging² (Haushalter, 2007). Secondly, the same pattern can be observed in highly competitive market, especially when the sector is financially constrained: the harder the competition, the more the company is liquid (Morellec et al., 2014; Hoberg et al., 2014).

Additionally, managers may prefer to hold cash rather than their alternatives, because cash can achieve their personal goals. Indeed, Wu et al., (2007) pointed out that a major explanation of additional cash holdings in Chinese listed companies is due to manager's self-interest rather than external financing complications (Ye, 2018). To prevent that, owners have an interest in using financial intermediaries as those intermediaries will create information and monitor activities and due to this, a higher level of leverage may lead to a poorer liquidity position (Bruinshoofd et al., 2002). Moreover, managers are often restricted on the use of cash alternatives, because of external funding, while the use of cash is more flexible and less restrictive (Ye, 2018). On the other side, owners would have less interest in cash holdings as they are able to diversify the risk of liquidation, a solution that managers do not have. A psychological tend is also the fact that shareholders are more profitability driven than managers, who are more 'size' driven (Bruinshoofd et al., 2004). In other words, managers are eager to build an empire rather than reaching an absolute profit. All of those studies explored what is called the agency theory.

Finally, liquidity has additional advantages cited by Hristozov (2021): "liquidity [...] facilitates the entrance of informed traders who produce valuable information about the firm, enhances the effectiveness of equity-based compensation to managers, reduces the cost of equity financing, mitigates trading frictions investors encounter when trading in the market to recreate a preferred pay-out policy, and lowers the immediate transaction costs and subsequent liquidity costs for firms conducting large share repurchases (Holden, Craig W., Jacobsen, Stacey E. and Subrahmanyam, A, 2014)."

b) Measurement of liquidity

Liquidity can be measured by the amount of cash, deposits, and money market instruments (Guerini et al., 2020). Almeida et al. (2014) highlighted a mismeasurement of US firms' liquidity in the scientific literature. Indeed, the author took as an example Apple, which held an important amount of cash in foreign countries (thus, adopting a horizontal perspective). Due to repatriation taxes, the multinational is not able to spend this cash held abroad and opted for instance in bond issuance to generate cash in the US. Almeida, citing Foley et al. (2007), states that Apple example is not unique. Thanks to the European context, companies holding cash within the E.U. should not face difficulties to withdraw money, as the E.U. foundation is based on the free movement of capital (Art. 67 of the Treaty of the Functioning of the European Union).

² see the section about liquidity improvement.

i. Acid and Current Ratio

In order to ensure comparability through time and companies, liquidity is also measured through ratios, such as the current ratio (Torsin, 2021; Guerini et al., 2020) and the acid ratio (Torsin, 2021). The former is computed as follows:

$$\text{Current ratio} = \frac{\text{Current asset}}{\text{Current liabilities} + \text{adjustment account}} > 1$$

The current ratio assumes that all current assets can be converted immediately to cash. At the opposite, the acid ratio excludes some of the current assets, assuming those cannot be converted fast enough to cash. The current assets exclusion consists of inventory, running contract, adjustment account and deferred income. The acid ratio is computed as follows:

$$\text{Acid ratio} = \frac{\text{current claim} + \text{cash investment} + \text{cash}}{\text{Current liabilities}} > 1$$

The ideal value of both ratios is above 1, meaning that the firm can finance its short-term obligations. Nevertheless, the value should not be excessive, as cash detention is not profitable.

ii. Cash Flow

Liquidity is affected by the cash in- and outflows, generated both by the activity and the moves within the balance sheet (for example, sales of a tangible asset, collection of a credit ...). Therefore, computing the cash flow reveals how the activity of the company influenced its cash position (Shahzad et al., 2016). The activity consists of income and costs, which does not necessary lead to cash flows. For instance, amortization and depreciation are costs that enter in the income statements, despite the absence of any outflow of cash. The cash flow can be computed following two methods:

$$\left\{ \begin{array}{l} \text{Cash Flow} = \text{Cash Income} - \text{Cash Expense} \\ \text{Cash Flow} = \text{Net Income} + \text{Non cash expense} - \text{Non cash income} \end{array} \right\} \gg 0$$

In case of a positive cash flow, the firm generates a cash inflow. Such inflow can contribute to finance the development and the modernization of the equipment for instance. In the opposite, a negative cash-flow, or cash drains, requires external financing as the operational activities do not generate sufficient cash.

With the introduction of the notion of 'cash flow,' an additional link can be drawn with the scientific literature. Almeida et al. (2014), based on a precedent paper (Almeida et al., 2004), constructed the concept of 'cash flow sensitivity to cash'. The concept is related to the portion of cash flow (thus computed as positive) kept under the form of cash, following a vertical perspective.

Constrained and unconstrained firms

A difference is noticed between constrained and unconstrained firms: unconstrained firms do not hold any significant portion of cash flow, while constrained firms prefer to hold an incremental portion of their cash-flow under cash. The reason beyond is the project of executives to operate current or future investment, thus, requiring cash. For example, in application with Bern et al. (2014), in the case of a constrained hospital, additional cash flow would be used to modernize the equipment or develop new ones. Similarly, financially constrained firms tend to reduce their investments in order to save additional cash (Almeida & Campello, 2007), presumably for their operations.

The classification of whether a company is constrained or unconstrained is under the subjectivity of the executives, even if the literature defined other factors: dividend pay-outs, asset size, existence of

a bond rating, existence of a commercial paper rating, the KZ index³ (Almeida et al., 2004), and lack of credit line (Sufi, 2009). In the opposite, some papers used ‘the cash flow sensitivity to cash’ notion to determine if a company is constrained or not (Hadlock & Pierce, 2010; Erel et al., 2014).

iii. Net Treasury

Another way to assess the liquidity of a company is by computing its Net Treasury, starting by the Working Capital and the Working Capital Needs (Torsin, 2021). The Working Capital develop how liquidity is sourced and how it is used. Still, the Working Capital gives only an insight on whether the current asset finance the current liabilities or not. Two methods compute the Working Capital:

$$\left\{ \begin{array}{l} \text{Working Capital} = \text{Restricted current asset} - \text{Short term payable} \\ \text{Working Capital} = \text{Permanent capital} - \text{Fixed asset} \end{array} \right. \gg 0$$

Ideally, the Working Capital should be positive. In that case, two interpretations can be drawn from the Working Capital according to Torsin (2021): the company is liquid thanks to an excess of current assets, or the company has sufficient equity to finance its fixed assets. The excess of current assets, in comparison with the short-term payable, contributes to finance the operational cycle of the company.

Zheng et al., (2021) noted that companies may adopt a so-called Working Capital strategy, which at the end, can generate profitability. Investing in the working capital allows the company to fulfil customer’s need effectively, thus improving customer’s satisfaction, which leads to loyalty and repurchase, and at the end, to better income (Afza & Nazir, 2007). However, the strategy requires inefficiencies in the amount of inventory held by the business, which can be solved by adopting aggressive working capital strategy (Raheman & Nasr, 2007). The strategy is applicable by reducing the amount of current assets and adapt the inventory with the emergence (or the absence) of demand, adopting a *Just-in-time* inventory management (Afza & Nazir, 2007). Nevertheless, the aggressive working capital strategy has also its part of disadvantages, as the management is obliged to ask for additional borrowings to finance its short-term liabilities in case of a mis-adaptation to the demand (Raheman & Nasr, 2007).

Nevertheless, the Working Capital should be compared with the need of it.

$$\begin{aligned} \text{Working Capital Need} \\ &= \text{Current asset} - (\text{cash} + \text{cash equivalent}) \\ &- \text{current liabilities out of financial short term debt} < 0 \end{aligned}$$

The needs determine if the company should invest part of its equity to finance the operational cycle. Optimally, the Working Capital Need should be negative, so that the operating cycle can finance itself. The opposite is often observed, and thus, a comparison with the Working Capital should be addressed, by computing the Net Treasury:

$$\text{Net Treasury} = \text{Working Capital} - \text{Working Capital Need}$$

Preferably, the Net Treasury should be positive, so that the company owns sufficient assets to finance its operating circle. In the opposite, the company is required to use its own cash or external source of

³ The Kaplan and Zingales (1997), or KZ, index is calculated as $-1.002(\text{CashFlow}/K) + 0.283(Q) + 3.139(\text{Debt}/\text{Capital}) - 39.368(\text{Div}/K) - 1.315(\text{Cash}/K)$ (Lamont et al, 2001). In other words, the KZ index assesses the degree of financial constraints by comparing altogether cash levels, cash flow, dividends, Q and leverage. Tobin’s Q is computed as follows: $(\text{book assets} - \text{book common equity} - \text{deferred taxes} + \text{market equity}) / \text{book assets}$ (Hardlock et al, 2021), and measure the market performance of firm’s share (Fu et al, 2016). Despite a large use by the literature, the KZ index seems to not correctly measure the level of financial constraints, as only two coefficients are reliable: cash flow and leverage (Hardlock et al, 2021).

financing. The company is not necessary insolvent, and may be far from going bankrupt, but the liquidity should be improved.

A verification procedure for the Net Treasury is to add the financial short-term debt in the computation, which at the end, will equal the cash in hands and cash in banks.

Improving the Net Treasury consists of influencing the Working Capital and its Needs. For doing so, the company has many opportunities as for instance: increase current assets, reduce short term liabilities, increase equity, or decrease long term assets to expand the Working Capital. In contrast, to lower the Working Capital Needs, managers should modify deadlines with stakeholders (increase time-to-pay with supplier while decrease time-to-recover with customers). Executives should also increase the flow of stocks, thus improving the rotation of those. And at last, they should modify the operations, as controlling the turnover, deferring some orders or outsourcing part of the activity (Torsin, 2021).

c) Liquidity improvement

Absorbing cash-flow shocks requires liquidity position to be flexible, which is feasible thanks to cash (Almeida et al., 2014), still under the vertical perspective. Additionally, such an asset allows the company to transfer an ability to finance from a geographical good state to a geographical bad state (horizontal perspective). But as seen above, the transfer might be prevented due to repatriation tax. Cash consist of a good mean to finance operating costs (purchase of raw material, energy, wages, ...), to finance opportunities, as well as to protect the company against risks (in case of an emergency for instance) (Ye, 2018).

To solve the issue, firms tend to improve their liquidity within a country with other tools, as credit line for instance (Nikolov et al., 2018; Almeida et al., 2014). Credit line works as “it allows the firm to access precommitted (*sic*) financing up to a certain quantity in exchange for the payment of a commitment fee” (Almeida et al., 2014). Credit lines acts as a put option on a pre-arranged rate, which gives an advantage in case of a period with increasing interest rate. In other terms, as an insurance (Almeida et al., 2014).

Nevertheless, to absorb cash-flow shocks, the executives should operate a trade-off between cash and credit lines as the former is less effective and the latter is collateral- and contingent- constrained (Nikolov et al., 2018). On one hand, cash is less effective due to its deadweight⁴ cost when hold within the firm, and managers tend to transform cash in cash-like alternative, such as Treasury Bond for instance. On the other hand, covenants from credit lines constitute a real challenge for managers, as, once the covenants are violated, managers do not have access to the credit lines anymore, and the profitability of their company decrease (Sufi, 2009; Almeida et al., 2014). Especially, firm with higher liquidity risk or less profitability do not wish to face a credit line revocation, as an additional cost appears. Thus, managers opt for cash despite the deadweight cost associated (Acharya et al., 2014). Furthermore, credit lines provided by banks can be revoked following difficulties for the bank itself. In fact, thinking of an entire economy in need of liquidity, both banks and companies are impacted. Banks might search for liquidity and limit their cash drains, by revoking credit lines for instance, which are also needed for companies in need (Holmstrom et al., 1998). Interestingly, some papers noticed that CFOs consider cash as an absorbing tool of cash flow shocks while credit lines serve as an ‘open-door’ for future opportunities (Lins et al., 2010). And statistically, more profitable companies rely on the credit line solution to manage their liquidity, rather than their cash and cash reserves (Nikolov et al., 2018).

⁴ Deadweight cost is the deletion of the resources of a company when the financial needs are low (Nikolov et al., 2018).

Other improvements of liquidity consist of equity issuance, loans, cash reserves (Nikolov et al., 2018) or hedging (Almeida et al., 2014).

Regarding equity issuance, companies tend to apply such a method once they are no longer able to contract debt (McLean, 2011). However, issuing equity faces the exact same problem as contracting debt: the firm need it the most when it may be no more accessible for the firm (Almeida et al., 2014).

According to Almeida et al. (2014), Treasury Bonds are a good alternative to cash, on the horizontal perspective, as the goal of it is to transfer an ability to another state, which is less advantageous. Citing Holmstrom et al. (1998), the author argued that the Treasury Bonds are linked with the state's policy, and adopting a Treasury Bonds from an advantageous state while being in a bad state consists of a good solution on the horizontal perspective.

On the hedging extend, management could use this tool as a perfect substitute (Froot et al., 1998; Almeida et al., 2014), under the horizontal perspective (*i.e.*, from a geographical state to another one). Still, the literature found some limitation on the perfect substitute: derivatives does not fully cover the firms-specific risks, while still fully covering foreign currency risk and commodity price risk (Disatnik et al., 2013).

In conclusion, lowering the short-term asset side or increasing the short-term liability side of a balance sheet will improve the liquidity position of a firm (Torsin, 2021).

Still, until now, we discussed about liquidity improvement, or in other terms, how to increase the liquidity of a company. But an excess of liquidity can lead to value destruction (Harford's, 1999; Almeida et al., 2014). Indeed, firms with an excess amount of cash attempt to acquire other firms, thus diversifying their activities with the risk of losing operational performance. However, those firms fund themselves with their own cash flow, while in the opposite, firms with an excess of cash flow thanks to externals are less likely to operate an acquisition (Cunha, 2014). Conversely, firms with excessive cash holding have a lower probability of being under a takeover (Baum et al., 2017 citing Harford, 1999).

B. COVID-19

In this subsection, we will define scientifically the virus of the COVID-19, with an analysis regarding decision taken by the Belgian government. The subsection ends with the intersection between the liquidity and the COVID-19, which in other words, illustrates the consequences of the disease on companies' liquidity position and the support provided by governments. At the end of this subsection, we can explain the following parts of the general structure of the schema:

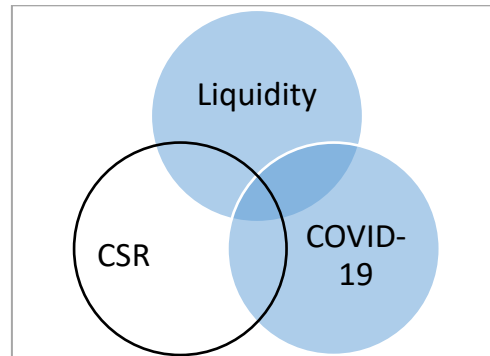


Fig 4: Advancement of the literature review.

Source: Made by us on Microsoft Word.

a) Definition

The appellation “COVID” or “COVID-19” that we will use during this paper came from the definition of the World Health Organization (WHO) in 2020. COVID-19 states for Corona Virus Disease 19 pandemic, thus explaining the worldwide characterization of a local epidemic. The pandemic started by a pneumonia epidemic in the city of Wuhan, in the province of Hubei (China). Scientists discovered a “severe acute respiratory syndrome coronavirus 2” (SARS-CoV-2 in short) in January 2020 (Ciotti et al., 2020).

Without entering in detail, the SARS-CoV-2 had many transmission channels, with the main one being *via* respiratory route. The virus was able to survive on inanimate surfaces, with the risk to individuals to contract the virus if they touched the surface with mouth, nose, or eyes (Ciotti et al., 2020). The incubation period of the SARS-CoV-2 was estimated between a period of 2.1 to 11.1 days, with a mean of 6.4 days. To stop the spread of the virus, governments established quarantine, mandatory face masks, recommendation about hand sanitizer, and recommendation on avoiding touching one's eyes, nose, and mouth (Ciotti et al., 2020).

b) Belgian ministerial decree

After reviewing 40 Belgian Ministerial decrees, certain patterns are detected following each new lockdown. Indeed, food shops, animals' food shops, pharmacies, bookstores, service stations and suppliers of fuel remained open between March 23rd, 2020, and Mei 20th, 2022, regardless of the situation in the country. Still, some restrictions on those were made about the maximum number of customers per square meters and the degree of accompaniment. Most of the time, supermarkets are restricted to one customer per 10 square meters and people should go shopping alone unless in the need of another person.

Many organizations being active during (a part of) the night saw their closing hour variates, depending on the situation in the country. For instance, casinos and betting office had to close sometimes at 10 pm, sometimes at 1 am. The Belgian government attempted to save commerce by prohibiting only the sale of alcohol at a certain time (often after 10 pm) and thus, preventing mandatory closure.

Some sectors were under different restrictions from others, especially the catering sector; beauty salons; non-medical pedicure institutes; manicure salons; massage salons; hairdressing salons and barbers; tattoo and piercing studios; Casinos and betting offices; Discotheques and dancing rooms. Indeed, while home office was made mandatory for all shops and commerce, the cited sectors could benefit (or not) from exemption, due to their high dependency of their customer's on-site presence.

Belgian citizens and foreigners were restricted on their way to travel: the government implemented an interactive map, citing 'red countries,' in which it was forbidden to travel in July 2020 but abandoned it after a few months. Overall, only Belgian citizens or outlanders having their residence in Belgium were able to travel back from a foreign country.

c) Impact of the COVID on Standards Companies' liquidity position

Before the emergence of the pandemic, the scientific literature already highlighted the influence of macro-economic factors on liquidity. For instance, a country's GDP, inflation, short-term rate or government deficit are significant determinant of corporate liquidity (Chen et al., 2008). In addition, executives' expectations of the macroeconomic situation drive an important influence on the cash holdings (Chen et al., 2008).

On the French perspective, the policy brief 76 of the OFCE⁵ (Guerini et al., 2020) states that companies entered the COVID crisis with more liquidity than during the last worldwide crisis of 2007. We find support, despite a large scale, in Almeida et al. (2014)'s literature review: non-financial S&P500 increased their cash holding from \$200 billion in 1996 to \$1,334 billion in 2012.

Analysing rapidly how firms reacted facing the financial crisis of 2007 could also provide an insight on how firms reacted to another crisis, despite their difference. In 2007, the crisis started from the financial market to the corporate market, while the COVID started its crisis from the corporate market toward the financial market (Guerini et al., 2020). Constrained firms, during the financial crisis, opted to cut their cash stocks by 15 percent point, with additional measure on their corporate management: reduction of employment, of technology spending, of capital investment and of distributed dividends (Campello et al., 2010; Almeida et al., 2014). In contrast, unconstrained firms showed little changes in their 2009 planned policy, with for instance, a reduction of only two points of percentage in their cash stocks. Surprisingly, companies that were dependent from banks did not lower their investments, and above all, they were able to accumulate more cash than non-dependent firms (Kahle et al., 2013). We consider that the financial crisis of 2007 is out of the scope for our analysis.

Regarding the time before the COVID crisis, firms relied more on short term loans than before. Guerini et al., (2020) conducted a simulation on how companies would have been affected according to predictions. The entrance into the lockdown would drain most of the liquidity of non-financial firms, as revenues would drop, friction in the market would emerge and fixed costs would not (or poorly) adapt to the situation. A solution presented by Guerini et al. (2020) is to relax the short-term work contract rigidity, which statistically reduces the number of firm suffering illiquidity. Similarly, Demmou et al., (2021) conducted another simulation, and conclude that up to 30% of existing companies in Europe would have faced bankruptcy if governments did not have reacted. An important detail highlighted by both authors is the presence, in their simulations, of already existing firms that would have been illiquid, whether a COVID crisis hit or not. Demmou et al., (2021) evaluate the rate of liquidity shortfalls to vary between 0.5 and 7 percent during the first month of the lockdown if there were no lockdown at all. Thus, based on the figure of 18% of forecasted illiquid companies, we can

⁵ OFCE : Observatoire français des conjonctures économiques - French observatory of economic conditions

compute that between 11 up to 17.5% of companies would face illiquidity due to the COVID during the first month.

McGeever et al., (2020) also predicted a heterogeneity among sectors and sizes: restaurant and hostels would be the most affected, while the least affected would be construction, information, and communication. The scientific literature identified the same sectors hardly impacted by the lockdown, in addition with the Wholesale and Retail, Art, and Transport sector (Guerini et al., 2020; Demmou et al., 2021; McCann et al., 2020). Still the literature diverges from sectors to sectors, as for instance, Entertainment is either hardly impacted (McCann et al., 2020) or not at all (Guerini et al., 2020), and Construction and Transport seems intermediate impacted (McCann et al., 2020) or at the opposite, hardly impacted (Guerini et al., 2020).

The liquidity position of a firm is not dependant solely on its management and the lockdown directly, but could emerge indirectly, through the link the firm has established with its supplier or customers (McCann et al., 2020). The firm may be affected by its stakeholders due to three main reasons: missed payments due, future demand shocks and input shortages. Due to those transmission channels, sectors that are firstly not impacted by the lockdown may found themselves in difficulties. Nevertheless, sectors with less difficulties trade, on average, less with intermediate or hardly impacted sectors (McCann et al., 2020). Yet, the relationship should be specified: if firms with less difficulties are supplier to hardly impacted firms, they may enter in difficulties too. The opposite may be not true, as a liquid company could improve the liquidity of its hardly impacted supplier. Indeed, the shock in liquidity was transmitted mainly upstream during the COVID crisis, where downstream shocks are more common during crises. In other terms, the liquidity of the end-user conditioned the supply chain, and might mitigate the effects of the lockdown (McCann et al., 2020). Such a fact is interesting, as Ye (2018) reported that an important amount of cash within a firm shows to the customer the firm's ability to perform its duty, therefore prioritizing the downstream shock rather than the upstream one.

Regarding the size, small and large firm would have a higher rate of illiquidity than medium-sized companies (Guerini et al., 2020). However, the reason found behind the higher rate for small firms is different from large firms. Indeed, small firms would suffer illiquidity due to scarce liquidity while large firm would suffer due to their higher debt level or leverage dependency. At the opposite, the notes published by the Central Bank of Ireland (McGeever et al., 2020) states: "SMEs are likely to be particularly vulnerable, as there is evidence, they can be hard-hit by declines in aggregate demand (Sahin et al., 2011)."

Almeida (2020) conducted a case study on Ruth's hospitality group, an American restaurant. Even though the results could not be generalized to a wider range, the paper still provides us an insight on how American companies reacted facing the pandemic. Ruth's, at the early stage of the crisis, was under a significant liquidity risk. Three factors are identified that could influence the liquidity risk: first, default in receivables, associated with a probability determined by the executives. Second, external fundings and third, operational adjustment, as the extension of payable to supplier for instance.

Ruth's asked for external funding, and especially long-term ones. Indeed, Almeida (2020) explains that a short-term external funding would not solve the liquidity problem at the end of the period. In other words, the problem is postponed at the end of the year. Thus, looking for long-term external funding would be a better decision. Ruth's conducted its founding trough two types: equity and long-term debt. In the latter, bonds could be found. However, Ruth's did not choose the bond. Issuing bond would lead to a rate, and Ruth's bond would likely be categorized as "junk bond". Additionally, Ruth's also issued equity to improve its liquidity position.

Interestingly, the access to the borrowing market was prevented. Indeed, due to an increasing interest rate, the adverse selection influenced the banks to shut down this opportunity for all companies. The decision is made concerning that only bad companies would still accept borrowing at a high interest rate. As, at our knowledge, there is no evidence that the borrowing market shut down in Europe, companies faced the similar issue due to another factor: the lack of collateral (Demmou et al., 2021). In fact, only 11% of companies being illiquid would be insolvent, but 27% of illiquid companies would express difficulties to access credit, due to either a lack of collateral, or a depreciation in the value of their collateral (Demmou et al., 2021). The simulation of Demmou et al. (2021) predicted that highly leveraged companies would be likelier illiquid than lower leveraged firms. The pattern was already identified before the pandemic, as firms tend to increase their cash holdings in time of high interest rate (Chen et al., 2008), hence prioritising their own cash rather than any borrowing.

Thus, Ruth's looked for another solution, which consist of its existing credit line. The manoeuvre brought to the company a 2 years-credit with a decent interest rate, according to Almeida (2020). Still, companies facing the financial crisis of 2007 were also looking for their existing credit lines. Ivashina et al. (2010) discovered a new type of run on credit lines: firms try to store as much liquidity as possible to face difficult times. Regarding Ireland, the volume of credit lines was likely to not be sufficient to cover all the needs of its market during the COVID crisis (McGeever et al., 2020). Moreover, Almeida et al. (2014) states that "small, private, noninvestment grade, and unprofitable firms drew significantly more from their credit lines during the crisis [Campello et al., 2011]".

An additional information is about the amount of liquidity Ruth's asked for. The firm increased its liquidity position beyond its immediate need, to have what called Almeida (2020) a 'precautionary borrowing.' McGeever et al. (2020) highlighted another reason: the future need of liquidity for the reopening after the crisis.

Finally, regarding operational adjustment, Almeida (2020) did not explore Ruth's executive decisions. Nevertheless, McGeever et al. (2020) provides us an insight on what involves operational adjustments: it consists of reducing non-personnel expenses. For instance, decrease rent, taxes, insurance, trade credits, debt repayment (break) and utilities.

The case study of Ruth's revealed obviously that companies faced a liquidity risk during the COVID crisis. Many solutions were found: equity issuance, long-term credit, bond, and extension of current credits lines. Altogether, the company created a 'precautionary borrowing' to cover its liquidity position beyond the immediate need (Almeida, 2020).

Despite those solutions, SMEs could not have the access to the different solutions adopted by Ruth's. Indeed, some SMEs remained independent from the financial market (McGeever et al., 2020): they did not establish any borrowing with any bank, thus closing the opportunity of extending an existing credit line. Moreover, some SMEs do not have sufficient collateral, especially in the service sector, to establish a relationship with a bank.

i. Support provided by governments in the literature.

At the early stage of the COVID, McGeever et al. (2020) identified three additional solutions to support companies, from the perspective of policy makers: credit guarantee schemes, lending schemes, and direct fiscal supports.

The first one will smooth the establishment of a relationship between a bank and a firm that have no sufficient collateral, still under the condition of a future profitability at the end of the lockdown. In other terms, governments guarantee to the banks that their customers, or in the worst case, that the

government will pay back. The credit guarantee scheme can benefit to companies that do not have sufficient collateral to ask for any credits.

The second is related to lending, either indirectly *via* private banks or directly to companies. On the one hand, direct lending to a bank consists of giving a fund to the financial institution, which will distribute under the form of credit to its customer. The bank appears as an intermediary between the government and the firms. Such a measure is flexible, as indirect lending allows governments to share risk or ask additional loan approval process (or not). On the other hand, direct lending implies that governments take all risks with the loan, and an upper administrative cost could be noticed.

Finally, direct fiscal support involves a relief in tax or subsidies. Interestingly, a tax relief, as VAT offset for instance, can also be considered as a direct lending of the governments. Tax relief could also involve deferred tax, while subsidies could be dedicated to the support of wages (Demmou et al., 2021). Nonetheless, this support requires accuracy. Indeed, McGeever et al., (2020) note that a lack of support in the total amount of salaries will still lead to illiquidity, while a surplus in the support leads to inefficiency and a transfer to private households. The same pattern is noted in the rent support. Still, wage support can be considered as the most powerful backing despite its cost according to simulations (Demmou et al., 2021).

Those support, despite a direct help, may lead to a negative effect in the future, as Chen et al. (2018) identified a positive correlation between lower GDP - due to higher government deficits – and corporate liquidity.

Altogether, the precedent schemes remain in a universal perspective, and countries differ by law, conditions, or time scale to offer their support (McGeever et al., 2020).

C. Corporate Social Responsibility

In this subsection, we will explore the concept of Corporate Social Responsibility (CSR). We will then lighten the intersection with the two precedent concepts, first marginally and then, jointly. During the exploration of the literature, we found an important bias on the measurement of the current concept: ESG ratings are divergent. The solution will be explored to the subsection D of the literature review. At the end of this subsection, we can explain the following parts of the general structure of the schema:

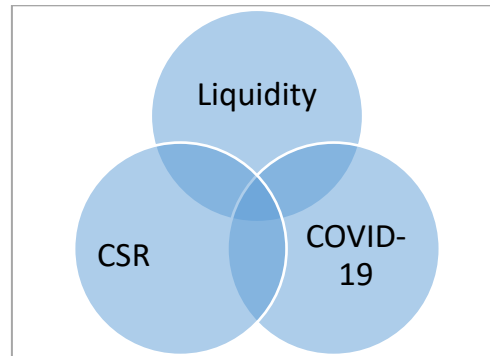


Fig 5: Advancement of the literature review.

Source: Made by us on Microsoft Word.

a) Definition

The primary goal of a business is to provide goods and services to the society, which in turn asks for the related goods and services. Nonetheless, businesses and society need a stable environment to evolve, as for example, an educated workforce (Cannon, 1992; Moir, 2001). Thus, society and businesses are intertwined entities rather than distinct.

The World Business Council for Sustainable Development (1999) defined the Corporate Social Responsibility as: “the ethical behavior (*sic*) of a company towards society. [...] management acting responsibly in its relationships with other stakeholders who have a legitimate interest in the business.” and “CSR is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.”

CSR may be associated with the stakeholder’s theory (Freeman et al., 2010) which identifies performance as the completion of stakeholders’ satisfaction. Therefore, adopting CSR implies that businesses should identify stakeholders, their aspirations and their needs and that companies should also interact with stakeholders by communicating (Moir, 2001).

Historically, CSR emerged in the 1950s (Brown, 1953) and, despite continuous debate in the literature, CSR is defined following 4 perspectives (Garriga & Melé, 2004): instrumental, political, integrated, and ethical. The instrumental perspective considers CSR as a way to maximize shareholder’s wealth, *via* a maximisation of profits (Freidman, 1970). For instance, CSR allows a provision for employment and taxes⁶ (Moir, 2001). The political perspective, in opposition, implies that CSR helps firms to affirm their corporate citizenship and affirm their political power (Davis, 1960; Davis, 1967; Davis, 1973), while integrated perspective involve accountability toward the society. In other words, the responsibility is defined as a means for executives to be held accountable for their actions (Brummer, 1991; Moir, 2001; Freeman et al., 2010). Finally, the ethical perspective suggest that CSR adoption is driven because of

⁶ Please refer to the fourth concepts of Höck et al (2022) explained below.

ethical reason. For instance, the adoption is to solve social problems, regardless of the responsibility in creating those social issues (Holme, 1976; Moir, 2001).

Still a demand has emerged for companies to tackle the disasters created by businesses on communities through a responsible behaviour, in order to improve standards of living and local condition (Anser et al., 2018). Yet, CSR stays as a voluntary practice (Van Marrewijk, 2003).

Some companies consider CSR investment as 'lost investment,' and therefore, do not adapt their existing strategy with their CSR strategy (Porter & Kramer, 2006). In other terms, they do not tend to meet a CSR performance, but only invest in short-term, high-profile but relatively inexpensive CSR practices (Browne & Nuttall, 2013). CSR investment may also generate an issue from the agency theory: managers try to take personal benefits (own interest or own reputation) from such investment and tend to over invest in CSR strategy, regardless of the CSR objective (Borghesi et al., 2014).

b) Relation with liquidity

Stakeholders relies on the ESG ratings (Environment, Social and Governance) of companies to obtain a good insight on how sustainable the company is (Drempetic et al., 2019), and so, to determine the degree of intensity of the CSR strategy.

Wasiuzzaman et al. (2021) pointed out a correlation between CSR performance and liquidity, but in an opposite direction from our research. The author argued that liquid firms reveal high CSR performance, nonetheless with some specifications in the measurements. Indeed, as the author measured liquidity with cash conversion cycle⁷, industry-adjusted cash conversion cycle, level of cash holdings, free cash flow, and cash flow from operations, only the two firsts validated their hypotheses. In other words, the shorter the cash conversion cycle and the sector adjusted cash conversion cycle, the greater the CSR performance. The same pattern was pointed out in another study (Uyar et al., 2022) where high cash conversion cycle results in better CSR engagement. Still, the engagement favours resources use, eco innovation, community and human rights while abandoning dimensions as emission reduction, workforce or product quality (Uyar et al., 2022).

On the agency theory perspective, the adoption of CSR strategy may mitigate the risk of private benefit extraction for the managers, which is at the expense of the owners. Indeed, CSR may be an instrument that implement a sort of collusion between the manager and the owners (Cheung, 2016). Wasiuzzaman et al. (2021) also highlight the (un-)importance of CSR committee for the adoption of the strategy. The author found out that, while small firms tend to have better CSR performance and decrease effectively the agency issue with a CSR committee, results tend to be mixed for large firms despite the presence of a committee.

It is worth noticing also that, according to Uyar et al. (2022):" [...] customers purchase products and services of firms that do good for the ecology and the community, and they pay faster to those companies. [The practice of] doing good for society pays back in the form of enhanced firm liquidity triggering customer sympathy." To rephrase, the positive relationship established between the business and the community, thanks to the CSR engagement of the business, allows the firm to convert faster the receivables into cash, which in turn, may also decrease the short-term liabilities' side. By making the parallel with the above, the community rewards the firm thank to the completion of the demand to tackle the disasters created by the business (see Anser et al., 2018).

⁷ Cash Conversion Cycle, also called net operating circle, is a concept referring to the amount of time needed to convert investments into inventories and other resources into cash inflow (Hristozov, 2021).

According to Giese et al. (2019), many papers have looked for quantitative proofs, with a lack of explanation of *how* sustainable practices have driven to financial performance.

We will assume in this section that credit default may be a proxy of liquidity. Indeed, we suppose that with a bad liquidity position, firms are unable to pay their debts which deteriorate the credit defaults rating. Thus, on a credit default perspective, four concepts can be identified that benefits to sustainable companies (Höck et al., 2022).

1. The first one is the regulation risk, which is explained as twofold: sustainable companies are more flexible to comply with new regulations as well as their practice prevent them from environmental or social fine (Graafland & Schouten, 2012). For instance, a low carbon emitting activity has much lower risk to face carbon taxes than heavy carbon emitting businesses.
2. The second concept is linked with the reputational risk and stakeholders. Indeed, customers or other business partners might punish a misconducting company by avoiding any purchase or contracts with this business. Moreover, firms that have poor ESG performance can see their reputation be harmed (Chatterji et al., 2009). In contrast, sustainable-driven companies have also the ability to retain high-quality staff (Wu & Shen, 2013). In other terms, CSR strategy-driven businesses have seen trust with other stakeholders, offering a sort of immunity in case of a crisis (Lins et al., 2017). This may be referred to an increase in what is called ‘a social capital’ that brought additional protection (Cheung, 2016). We could also apply the concept of social capital on the findings of Uyar et al. (2022), regarding the speed of payment of communities toward CSR companies.

At the opposite, CSR may also result in lower cash holding (which is a proxy of liquidity) due to their additional protection against risks (Cheung, 2016). Indeed, as the reputational risk is mitigated, executive may be inclined to lower the cash holding, which is considered to absorb cash-flow shocks. In addition, the relationship established with sustainable-oriented investors allows the CSR firm to reduce systematic risk, and consequently, cash holdings. However, the decrease of cash holding leads to a paradox: the decrease of cash implies an increase in short term refinancing, which may be mitigated by higher level of cash holdings (Cheung, 2016).

3. Thirdly, there is an increasing number of investors that are willing to invest in sustainable strategies. Misconducting companies will suffer of a lack of new investors and face difficulties to raise equity. Chatterji et al. (2009) highlighted the motivations that drive investors towards sustainable companies. They invest in order to benefit from the correlation between high sustainability and financial performance, to ensure their profits are made from ethical behaviour, to reward/punish the firm accordingly to its behaviour or to express their identity. Indeed, the engagement in CSR activities of firms in specific sectors result in a better financial performance, according to Bae et al. (2021).

In addition, companies that have been faced with controversies regarding social or environmental practices might be exposed to a higher stock market risk (Donaldson and Preston, 1995; Jones, 1995).

4. The last concept explains that sustainable companies are less eager to be harmed by an event. Thus, sustainable companies are also robust against event-driven risk. (Höck et al., 2022). For instance, companies caring about their employees’ welfare are seen positively by investors, which enhance the company’s value and reduce firm’s risk (Jo and Na, 2012).

To give a practicable example, the chocolate company Galler was harmed by a flood during the summer 2021 in Belgium (Galler, n.d.). The production stopped but employees engaged themselves in restoring the factory, in particular because the company had strong CSR practices related to the suppliers. Indeed, Galler has committed itself to purchase coca beans from farmers at a fair price (Galler, n.d.).

The adoption of Corporate Social Responsibility strategy decreases also the credit default risk as the organization can create an intangible asset. In time of crisis, such an asset might protect hence the organization (Sun et al., 2014). The intangible asset can be seen as the company's reputation promotion for instance (Chen et al., 2017), or trust towards stakeholders (Lins et al., 2017). In addition, the intangible asset allows the business to charge a premium to its customers, thanks to the generated competitive advantage (Wu & Shen, 2013).

The importance of innovation

Similarly, the implementation of a CSR strategy fosters the company to create innovations too, which at the end, creates a competitive advantage. For instance, CSR strategy involved new way of working, new products, new services, new processes that led to a new market segment (Battaglia et al., 2014). Papers already pointed out the positive correlation between CSR and innovation (Rodríguez Jasso et al., 2022), especially for technological innovation (Bocquet et al., 2013; Rodríguez Jasso et al., 2022). Other fields have also their opportunities, as the inclusion of diversity enables complementary ideas or communication between managers and stakeholders, thus opening new market segments (Battaglia et al., 2014).

Still, innovation has its consequence on liquidity. Beladi et al., (2021) pointed out the importance of funding those innovation. Indeed, innovation often "requires a large number of funds from the initiation to completion of the project" (Beladi et al., 2021). In case of a firm becoming financially constrained⁸, the executives tend to lower the degree of innovation and investment, especially if the cash flow outcome is less predictable. In other terms, if executives face an uncertain cash flow, they will prefer to reduce innovation and investment to keep sufficient resources for their current operations. This fact emerges as executives must rely only on their own cash to finance innovation.

c) Relation with COVID-19

The COVID-19 caught everyone off guards, with many consequences on individuals and on companies as well. The perception of the world changed, with probably a major impact on CSR (He & Harris, 2020). For example, companies reoriented their activities to manufacture respirator, face masks, antibacterial gel ... and even joined the sector of donation for those products (He & Harris, 2020). As a total unexpected challenge arose for firms, the COVID also tested the true ethical commitments of some companies (Bapuji et al., 2020).

On a larger extend, the components of CSR were applied by many other companies in reaction to the challenges imposed by the COVID. Despite the motivation mainly emerged from the governments' regulations, companies improved their employees' condition in order to lower the impact driven by the lockdown such as accrued unemployment or vulnerability in physical integrity. To do so, firms increase the knowledge of workers (through teaching and preparation) (Gursoy & Chi, 2020), increase the level of hygiene within infrastructures, provide protection equipment (Gursoy & Chi, 2020), and implement home office and better coordination (Glaveli, 2020). Altogether, employees committed more towards the company (Kraus et al., 2020). Still on the social responsibility side, businesses have

⁸ Developed above, sub section A.b. measurement of liquidity.

created safer place for their customers, as level of hygiene improved, which become a must for customers (Jiang & Wen, 2020). Moreover, the relationship between customers and businesses has evolved: use of online support services, online workshops, home delivery, internet shopping, and applications (He & Harris, 2020). In sum, companies were seen as mitigating the spread of the virus among the population (Jiang & Wen, 2020).

Another benefits that emerged from the lockdown is the correlation highlighted between the decrease of consumption and transport and the greenhouse gas emission, plus the impact on the wildlife (Helm, 2020), which constitute also a part of the CSR. Indeed, the link between consuming and transporting activities and greenhouse gas has always been demonstrated theoretically, but the public could also notice the difference once the activities stopped in practice.

d) Intersection of the three concepts: liquidity, COVID, CSR.

At our knowledge, we found no papers combining liquidity, the pandemics, and the CSR strategy altogether, and therefore, we will look for some insight on the CSR-lockdown literature.

Firstly, we found a paper written by Bae et al. (2021) analysing if CSR presented robustness on the financial performance of US firms during the COVID-19. Their findings suggest that there is no evidence that CSR protected the stock return during the crisis. In other terms, companies caring about their stakeholders failed in outperforming the market. Indeed, those firms have put themselves in a bad financial state as they have overinvested in CSR activities (Yi et al., 2022). Those findings align with the opinion of some firms, which consider CSR investment as lost investment (see above; Porter & Kramer, 2006). The only exception appears when analysing specific sectors, where CSR affected the stock return in Consumer Durable, Chemicals, business equipment, and healthcare. Bae et al. (2021) also found that CSR affected positively the stock return in companies present in Democratic states. In the opposite, Zheng et al. (2021) pointed a moderating role of CSR in the negative impact of the COVID. Yet, this statement needs accuracies: at the difference of Bae et al. (2019), Zheng et al. (2021) analysed Chinese firms within and around the Hubei province. The findings revealed still a heterogeneity, where firms within the province experienced an insignificant moderating role of CSR and firms around the Hubei province experienced a significant one. Despite Bae et al. (2021) analysed only the financial performance, we obtain an insight on the role of CSR in offering robustness towards companies: mixed, in terms of return. As profitability (and thus return) is linked with liquidity (Torsin, 2021; Boso et al., 2017; Ott et al., 2017), we may find no results in CSR as a moderating role for liquidity scarcity.

Still, the literature finds little differences among companies, and especially it finds small changes that can benefit to companies from adopting a CSR strategy. For instance, Huang et al. (2021) found that CSR contribute to more resilience in companies that were highly (even over-) leveraged during the lockdown. Indeed, the author noticed that less leveraged companies have lower debts, thus, leading to easiness for absorbing cash-flows shocks *via* additional debts. In the opposite, firms with a lot of debts in their capitals faced difficulties to contract additional debt, leading to complications, and eventually to bankruptcy. Leverage is often qualified as a double-edged sword: interest expense is considered as expense, which reduces the amount of tax payable, but also increases financial distress likelihood (Myers, 1984; Zheng et al., 2021). Nevertheless, Huang et al. (2021) discovered that CSR played an insurance-like role and offered better resilience to (and only to) highly leveraged companies that adopted a CSR strategy. The contradictory is also observed: highly leveraged companies with a poor CSR strategy were significantly financially affected. At the same time, lower leveraged companies did not face a mitigation in their shocks due to the adoption of a CSR strategy, thus, involving an over investment of those companies in a CSR strategy (Huang et al., 2021; Yi et al., 2022).

Altogether, we are able to identify a strong heterogeneity of findings in the literature. At this stage, we are able to predict that our findings will depend on 'filters' as differences among companies create or erase impacts from CSR adoption.

e) Controversy on ratings

Drempetic et al. (2019) has highlighted the fact that all papers rely on ESG rating provided by rating agencies. The ESG ratings measure the level of CSR, and those ratings are useful for the stakeholders. Indeed, the stakeholders might lack expertise or access to the whole information to assess if a firm cares sufficiently for the environment, its social impact, or its governance. Therefore, ratings will be used similarly to a credit default predication risk: they reduce the information asymmetry between the stakeholder and the firm. Stakeholders are looking for both the past and the future in the firm's ESG performance (Chatterji et al., 2009). The main rating agencies are Bloomberg ESG Ratings, CDP Scores, FTSE Russell ESG Ratings, ISS ESG Ratings & Rankings, MSCI ESG Ratings, Refinitiv ESG Scores, RepRisk ESG Rating (RRR) and many others.

However, Berg et al. (2019) pointed out that ratings are quite divergent: their correlations vary between 0.42 in the worst to 0.73 in the best. To illustrate the divergence, the author cites the correlation between two credit rating agencies: 0.99. In addition, ESG is a concept evolving, and ESG rating is in its infancy compared to the maturity of credit rating (Berg et al., 2019).

As those rating agencies does not disclose their procedures (Chatterji et al. 2009), ESG ratings cannot be compared among different agencies (Chatterji et al., 2014). Moreover, ESG ratings are correlated with the size of companies. Indeed, Drempetic et al. (2019) discovered that large firms have more resources to disclose ESG data, thus, creating a bias in the rating of those large firms regardless of the meaning of such data. In other words, a large company might disclose more ESG data, which will draw an improvement in the rating despite the presence of negative ESG disclosures. In contrast, SMEs face many challenges to be sufficiently transparent (Paelman et al., 2020). For instance, they can allocate their few resources to the substance and limits the disclosure process (Harjoto et al., 2018). Consequently, stakeholders that lack information may base their decisions on measurement errors rather than the reality (Chatterji et al., 2009), or in other terms, they rely on forms rather than the substance.

Additionally, in the context of impact measurement, no method has been accepted uniformly (Diez-Busto et al., 2021). This led to several measurements or ratings that lack transparency, comparability or even legitimation. The consequence of such divergence leads to inefficiencies for three stakeholders (Berg et al., 2019):

1. Investors may misallocate their resources to non ESG firms despite their will,
2. Firms may be frustrated as their effort could not be recognized by some ratters,
3. Divergence may divide the scientific literature.

The latter has a strong consequence on our precedent work: results that we have observed in the literature could be biased.

Therefore, the analysis on the level of sustainability should rely on a single organism to ensure comparability among companies. Moreover, the rating agency should be transparent in its rating process, with a priority put on the substance rather than the form. Altogether, we will be able to legitimize the backbone of our research. We made the decision to take a label into account: the label B Corp.

D. The label B Corp

As a solution to the issue highlighted previously, we will define the theoretical framework of the use of signals. This undersection will represent a first component. Then, we will analyse the movement beyond the label and the procedure to be certified which will represent a second component. The two components will then be associated, in order to see synergies between the theory and the practice. Finally, we will look at the motivations and the predictable consequences after being labelled. At the end of this subsection, we can explain the following parts of the general structure of the schema:

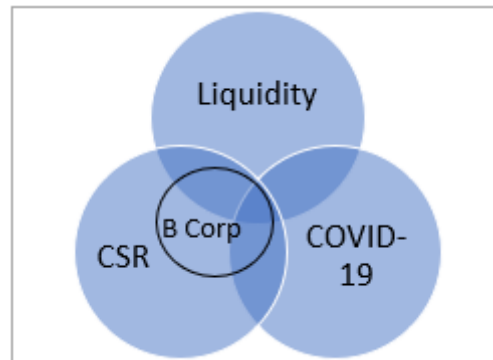


Fig 6: Advancement of the literature review.

Source: Made by us on Microsoft Word.

a) Theoretical framework

On the theoretical basis, Connelly et al. (2011) summarized the Signalling Theory. The Signalling Theory is an important field, as at least one Nobel Prize was delivered to economists for their research and findings in the information theory: George Akerlof, Michael Spence and Joseph Stiglitz in 2001. Moreover, this theory is not applied only in the economic field, but also in psychology, biology, anthropology, and so on. The signalling theory is a key concept to counter measure the information asymmetry among actors (Spence, 2002). The information asymmetry born from a duality in the information source: an actor has both public information and private information. The former is accessible to the population, while the latter is accessible only to the actor or a group of actors. An individual who does not have access to the private information can take decision that he would not have taken if he had known the private information (Spence, 2002).

The information asymmetry appears in two main fields: the intent of a company and the quality (Stiglitz, 2000). The intent is related to the (future) behaviour from one party, while the quality can be defined following multiple perspectives. We will choose to stick to the following definition: " *quality refers to the underlying, unobservable ability of the signaller to fulfil the needs or demands of an outsider observing the signal*" (Connelly et al., 2011). Therefore, we can define the demand of the outsider as the ability of the signaller to adopt a CSR strategy. In other terms, the signaller should engage in CSR as much as the outsider is asking for.

Nevertheless, the signalling theory lies in a timeline. Indeed, the Signaller (1) send a Signal (2) to a Receiver (3) which sometimes also provide a Feedback (4) to the signaller.

Some circumstances imply a multiplicity in signals, that could get along or in opposite directions. To assure clarity in our explanations, we will stay in the simplest timeline, as Connelly et al. (2011) states that the literature follows the same principle.

(1) The Signaller:

Signallers are insiders who own an information which is inaccessible to the potential future receiver. The signaller can decide whether he will deliver the information or not, as the information will influence the Receiver (3) decision making process.

In our study, the Signaller can be considered as a company willing to communicate its level of CSR adoption.

(2) The Signal

The Signal, firstly owned by the signaller, can either be positive or negative. That is why the Signaller has the opportunity to deliver the information but can also chose to do not. The Signal establishes a private information, thus, not accessible to the general population. The signaller is willing to disclose only positive private information, even though, some negative information could also emerge (Connelly et al., 2011). As an example, the issuance of new shares is considered as a negative signal: externals suppose that the executives took the decision to issue the shares, because the executives think – presumably – that their shares are overvalued (Myers & Majluf, 1984).

A signal is effective as far as it is observable and presents a certain cost. Observability is a key, as a non-observable signal will not be noticed by the Receiver. Thus, the Receiver would take the same decision if the signal is delivered or not. In contrast, reinforcing the frequency or the strength of a signal improves its observability and its underlying effectiveness (Janney & Folta, 2003). Frequency can be seen as twofold: either an update of the information regarding a change in the environment, or a repetition trough time ensuring a reputational history (Heil & Robertson, 1991). The environment in which the timeline occurs can also affect the signal observability (Connelly et al., 2011).

The cost is important as well, as it provides a proof that the signal is not faked. Indeed, in comparison with high quality firms, companies with lower quality will face more costs either to cheat or to transform themselves to become high quality company. If the signal was not accompanied by additional costs, low quality firms would attempt to cheat or not improve themselves, making the signal useless as receivers would not trust it anymore. To summarize, its observability and cost add credibility to the signal, ensuring that the signal fits with its underlying information.

Signals can be classified under many types. We note only the intent signal, which is related to the information asymmetry about future intention, and the camouflage signal, which is related to a strategy of diverting the receiver's attention.

Thus, in our study, the signal represents the level of CSR-strategy. Firms with a high level are willing to disclose this information. However, externals should observe the Signal and trust it thanks to its cost. Faked signal or camouflage signal can be associated with the concept of Greenwashing⁹.

(3) The receiver

The receiver is willing to receive the signal. Indeed, he does not have the private information that lies in the signal. Receiver might have also some conflicts of interest with the signaller (Bird & Smith, 2005). In such a case, the receiver should provide an incentive to the signaller.

⁹ "Greenwashing is the process of conveying a false impression or misleading information about how a company's products are environmentally sound. [...] greenwashing may occur when a company attempts to emphasize sustainable aspects of a product to overshadow the company's involvement in environmentally damaging practices" (Investopedia, n.d.)

For instance, the relationship between a CEO and financial analyst is close. Indeed, in short, the analyst's forecast determines whether the CEO can obtain a bonus or not if he by passes the prediction (Richardson et al., 2004; Torsin, 2023). However, the analyst, in order to forecast correctly, needs private information owned by the CEO. Thus, CEO might exchange private information with the analyst in exchange of a light pessimistic forecast from the analyst. Such an agreement is profitable for both parties: the analyst did an accurate prediction while the CEO out-performed slightly the threshold (Richardson et al., 2004; Torsin, 2023).

Another aspect is the receiver's ability to look, find and interpret the signal correctly. If it was not the case, the receiver would base his decision on the private information he owns, regardless of the signal. The outsider could also imitate its counterparts if the signal is sent to many Receivers (Spence, 2002).

For our study, we will identify at first the receiver as any stakeholder willing to determine the level of sustainability of a company.

(4) The Feedback

The signaller is interested in the effectiveness of his signal. Indeed, as he is sending signals to the receiver, he may not know whether his signal is found or interpreted correctly. Thus, the receiver can also send feedback to the signaller so that the signal can be improved. Interestingly, a signal called 'Need signal' indicates that the receiver is in need of the private information owned by the Signaller (Connelly et al., 2011). The Feedback can therefore be sent before the start of the timeline or after the signal underlying the private information is received.

Nevertheless, a specific Feedback consists of the allocation of an extra cost: the penalty cost. The Receiver decides to punish the Signaller, as the Signal have been detected false.

In conclusion, the timeline, which consists of an exchange of a private information among two parties, an insider and an outsider, contributes to reducing information asymmetry. The signal, as seen above, can solve the asymmetry emerging from the absence of information about the intent or the quality of the company.

b) B Corp conceptualization

At the previous section, we analysed a major component which consists of the theoretical framework. The following one will identify the second major component: the practice.

The B Corporation, or B Corp, is above all a movement. An organization, which enters the movement, consider its profits as a *mean*, not as an end (Stubbs, 2016). Indeed, the end is the *impact* provided by those kinds of organization. Impact can be understood as a benefit to "people, communities and the planet" (Annual report B Corp, 2021). The movement is also called *hybrid enterprise*, reflecting the duality between the impact and the financial performance (Paelman et al., 2020).

The B Corporation movement should not be confused with the Benefit Corporation (Diez-Busto et al, 2021). Despite this claim, some studies have considered them as synonyms (for instance, Mele et al, 2018). The Benefit Corporation is inspired by a legal structure present in some states of the US: the hybrid enterprise often adopts those structure, but the legal structure is neither a prerequisite nor a consequence to the B Corp movement (Paelman et al., 2020). In contrast, the B Corp is a voluntary movement, not a legal structure, despite both B Corp and Benefit Corporation are stakeholder's oriented (Paelman et al., 2022). In Belgium, no equivalent to the Benefit Corporation have been found in terms of legal structure.

As we can see in the Signalling Theory, the company entering the movement of becoming a B Corp can look for sending the right signal. Indeed, its quality in being sustainable is still not seen in the public. Being part of the B Corp movement is a private information, which requires a signal to transform it to a public information. Sending a simple signal (through websites, advertisement ... for instance) might not be effective, as the company faced no cost to disclose the signal, and that it might not be correctly interpreted by the receivers.

For that, companies that enter in the movement can be certified by the B Lab. The B Lab, founded in the USA in 2006, is an independent third-party entity that will audit the company. The non-profit organization is financed by funders, that goes from foundations to individuals, as well as the certification fees (B Lab, 2021). The certification fee ranged from \$1,000 to \$50,000 in 2020 (Paelman et al., 2020) and is based on the sales of the certified entity. The label acts as a sign that proves the excellence in the environmental and social performance of the company, but also that all stakeholders are considered in the decision-making process (B Corp Spain, 2021 cited by Diez-Busto et al., 2021). Harjoto et al. (2018) qualifies the B Corp certification as *“unique in that it seeks to drive positive and systematic societal changes through repurposing the existing capitalist structures and developing innovative solutions to measure the social and environmental impact of businesses”*.

The purpose of the B Lab is to stimulate the hybrid model, and above all, the sustainable movements of companies. For that, the B Lab delivers certifications, but also advocates to legislators for the adoption of a legal structure adapted to the hybrid model, provides a rating system to foster the impact investing and advertises success-stories of companies that entered the B Corp movement (Cao et al., 2017 cited by Paelman et al., 2022).

c) Certification process

In order to get the label, companies should comply with three main factors which will consist of the certification process.

First, the company should be submitted to an impact assessment. The impact assessment is a free test and delivers the label B Corp once the company have reached a score of 80 out of 200. This score demonstrates that the company perform environmentally and socially. The test is designed according to the company, the size, the industry, and the geographic location (Diez-Busto et al., 2021). The impact assessment evaluates 4 categories: Governance, Workers, Environment and Customers. (B Impact report cited by Paelman et al., 2020).

On the last report of the B Lab (2021), a total of 196,000 companies submitted to the test since 2006, while only about 4,300 of them have reached the sufficient requirement to get the label.

Additionally, to the impact assessment, the company must change its status or commit legally that she will be accountable to all stakeholders. Thus, the governance structure is no more shareholders oriented.

Finally, the last requirement to get the B Corp labelling is to exhibit transparency in its processes of self-evaluation (B Corp, 2023; Paelman, et al., 2022).

According to the literature, the company has also to sign the B Corp Declaration of Interdependence and the B Lab Term Sheet. Moreover, a certification annual fee must be paid (Diez-Busto et al., 2021 and Stubbs, 2015). The fee is not mentioned in the webpage “bcorporation.eu” for the certification.

The label can be hold only during a period of 3 years, after which a re-certification procedure must be pursued to hold the label (B Corp, 2023). Yet, we found some papers citing the figures of a period of 2 years (Stubbs, 2016). It is assumed that the period time have been increased, notably due to the

increasing numbers of impact assessment test performed. Moreover, the B Lab reviews 10% of its certified companies per year, on a random basis (Paelman et al., 2020).

As we have the two major components, we will merge the theory and the practice. The goal is to assess how legitimate the label B Corp can be to evaluate the level of sustainability of a firm.

According to the last paragraph of the section “Controversy on ratings,” we can determine that the label B Corp is transparent in its process of certification. Even though the test is driven by the firm itself, the B Lab also audits the company. Thus, a third party assess the level of sustainability of the firm.

Additionally, regarding the Signalling Theory, the label B Corp can be considered as the Signal. The label reduces a quality information asymmetry about the degree of sustainability. The Signal is observable and costly, which indicates a level of credibility. Moreover, a frequency is present, thanks the limited life of the certification, which strengthen the credibility. The certification presupposes a focus on stakeholder, which eventually could provide feedback. Altogether, the label B Corp can be assumed to be an effective Signal from a theoretical perspective.

d) Comparison between B Corp and other concepts of sustainability

As seen in the Signalling Theory, a timeline can consist of many signals. Therefore, we analyse in the literature how the label B Corp can be compared to other signal that a receiver might find about a company. The goal of such a comparison is to analyse if signals could be opposite, and if so, where the difference came from.

The B Corp is a relatively correct proxy to CSR. Indeed, the CSR framework is divided in 6 factors (Harjoto et al., 2019):

1. Actions should be voluntary,
2. Externalities should be addressed,
3. Stakeholders are considered,
4. Absence of contradiction between the social and the economic responsibilities,
5. CSR is included in the core business,
6. CSR is included in the value system.

We will provide an answer to all six factors. Firstly, Harjoto et al. (2019) states that the subscription to the label is a voluntary action (1). Due to the willingness of B Corporation to have an impact, the certified firms are addressing externalities explicitly (2). As seen later, the consideration of all stakeholders is mandatory to apply for the label (3). Then, despite the for-profit aspect, the end purpose of B Corporation is still the social and environmental issues, as they consider the profit as a *mean* (Stubbs, 2016) (4). The Corporate Social Responsibility is therefore included in the value system (6) as well as the core business (5). Therefore, according to Harjoto et al. (2019), we can state that the B Corp movement is part of the CSR strategy.

Additionally, the label can be put into contrast with other certification (Paelman et al., 2020): the Global Reporting Initiative (GRI), IRIS+, ISO 26000, ISO14001 and SA 8000. We will list all of them and analyse in which part the label could outperform or provide opposite information with those certifications.

The GRI is a guideline proposing a standardize way of reporting non-financial information. As the label B Corp, the GRI provides a certification. However, the certification is related to a training program according to the official website of the GRI. This means that the GRI is focused on the form rather than the substance. For example, a company could perform poorly in terms of CSR, but still get the GRI

certification as the company disclose accordingly to the GRI accountability. At the opposite, the label B Corp is substance-oriented: the poorly performing company will not be certified despite its reporting methodology. Yet, the GRI attempts to facilitate communication between companies and (all) stakeholders.

The IRIS + system is also a reporting standard. It is designed to reduce the information asymmetry, but mainly for investors. According to their official website, the use of IRIS+ systems allows investors to have a clear picture and to compare investments opportunities. Thus, not all stakeholders are considered, which is the case for the label B Corp (Paelman et al, 2020). Moreover, no certification is provided, and it seems that the form is above the substance, as the GRI. Indeed, the IRIS+ provide guidance regarding non-financial disclosures. At our knowledge, the IRIS+ is a standardized process, according to the website, despite the heterogeneity in the data filtered.

Regarding ISO 14001:2015, ISO 26000:2020 and SA 8000:2014, the B Corp certification complies with all of them (Paelman et al, 2020).

The SA8000 and B Corp share a point in common in their history: both were designed by businesses and academic experts, with at the end a proprietary scheme. A company can be certified by the SA 8000, irrespective of the type, the industry, or the country. However, SA 8000 focuses only on the social aspect of the firm and does not analyse the environmental or economical aspect. Thus, some stakeholders could be forgotten as they have a stake in the environmental or economical surrounding of the company. Still, as the B Corp certification, the SA8000 requires a self-assessment test in addition to an external audit. Therefore, we are able to state that the substance is predominant to the form.

The same difference is found with the ISO14001, which analyses only the environmental aspect, with no regards to the social or economic one. The ISO14001 provides a certification and covers all types, industries, or countries as well. Nevertheless, the ISO14001 provides first guidance, and only secondly certification. The certificate is given by an external third-party auditor. Going through the ISO14001 website shows us that the certification is not the primary goal, thus leading us to a mitigated answer regarding its ‘substance over form’ question. Indeed, companies may state that they follow the guidance of the ISO without doing so, but in the opposite, certification allows stakeholders to grab the substance of the company’s activity.

The ISO 26000 provides guidance rather than requirement according to the official website. In comparison with the ISO 26000, the B Lab audits and delivers a certification, which is not the case for the ISO. Moreover, the B certification encourages companies to address the negative externalities, while the ISO 26000 seeks only to identify those (Harjoto et al., 2018). As the SA8000 or ISO14001, the ISO 26000 is also applicable regardless the type, the industry, or the country despite the absence of any certification. In that case, we suppose that the lack of any auditor drives a lack of credibility for companies that states complying with the ISO26000. Finally, the ISO26000 focuses merely on providing guidance for social responsibility, letting aside at least the environmental factor.

	Standardization	Certification	Substance over form	All stakeholders
Label B Corp	No	Yes	Yes	Yes
GRI	Yes	Yes	No	Yes
IRIS+	Yes	No	No	No
SA 8000	Yes	Yes	Yes	No
ISO 14001	Yes	Yes	Yes	No
ISO 26000	Yes	No	No	No

Table 1: Comparison of the label B Corp and other measure of sustainability.

Regarding the Signalling Theory, a Receiver could receive opposite signals from a firm, depending on which signal he observes. From the precedent paragraph, we can conclude that the B Corp label is the most trustworthy. However, we see that only the Label B Corp is not standardized to all sectors or companies' type, which is a deliberate choice from the B Lab.

e) Interest and motivations in the certification

A question remained in suspend: what are the interests of a company to adopt a hybrid model and/or be certified?

On a theoretical perspective, the adoption of the hybrid model can start from a reaction between the company and its environment (Hannan and Freeman, 1977). The company *adopts* the model to *adapt* with its environment. Especially, the adaptation can be driven through three mechanisms of isomorphism¹⁰: coercive, mimetic, and normative (DiMaggio and Powell, 1983).

The coercive mechanism is explained by the company being under pressure. For instance, local communities can push the company to adopt a CSR strategy. In that case, the company is under an environmental pressure and adopt the model 'passively'. This means that the company is forced to enter in compliance with an external force.

In contrast, the normative isomorphism is related to a motivation to adapt toward the environment. The education of the surroundings draws on influence on the company, as well as the education of its managers. For instance, interacting with CSR-oriented counterparts influences the company to adapt a CSR strategy to enter in conformity with its environment. The company is not under a pressure, like the coercive isomorphism, but complies with its environment. As an example, Mele et al. (2018) discovered that B Corporation draw an effect on the service ecosystem: their behaviours, visions and ideas inspire other actors. From such effects, a community can arise.

Finally, the mimetic mechanism influences the company thanks to more legitimate or successful counterparts. The company imitates its environment in order the get the same benefits. For instance, in an assumption that ESG investments have better financial performance, a company willing to have more profit will carry an interest in ESG investment. In addition, we can draw the parallel with the robustness of credit default risk of Höck et al. (2022) in the adoption of CSR strategy: protection against regulation risk, against reputational risk, new will of investors and protection against harmful events. Moreover, firms that have high ESG performance sustain financial performance (Friede et al., 2015; Orlitzky et al., 2003) and are less prompt to default their credit (Aslan et al., 2021). In contrast, low socially performing firms are more affected by market risk, as far as the related period has a small or moderate volatility (Oikonomou et al., 2012). Nevertheless, the literature remains divided: some authors found negative or neutral effect between corporate social performance and financial performance (for example, Bae et al, 2021). Chen and Kelly (2017) found B Corp have a lower turnover than their non-B Corp counterparts, but also a higher growth rate.

Harjoto et al. (2018) found that the adoption of a B Corp certification is driven by those three mechanisms. On the one hand, local communities influence companies through coercive and normative isomorphism. On the other hand, competition also influences the company to be audited by the B Lab: the stronger the competition among companies, the more eager is the company to obtain the certification. We interpret this will as the importance of differentiation, such as the creation of an intangible asset thanks to CSR performance (see above; Sun et al., 2014). Harjoto et al. (2018)

¹⁰ "Isomorphism is a very general concept that appears in several areas of mathematics. [...]an isomorphism is a map that preserves sets and relations among elements." (mathworld.wolfram.com, n.d.)

discovered that the coercive mechanisms through political community encourage much more than the normative mechanism to attempt a certification process.

However, some hybrid entrepreneurs get the certification only to be part of the B Corp community. Their practices were already aligned with the certification even before the submission process (Stubbs, 2016). Thus, the hybrid entrepreneurs were under the normative mechanism as it is referred to an initial level of education, or mindset in this case.

Yet, we can also find in the literature a question of legitimacy: some B Corp looked for the certification in order to draw a clear picture and ensure credibility towards investors (Chauhan and O'Neill, 2020). The certification also validates internally and externally the identity of the B Corp (Stubbs, 2016), and represents the perfect example that we illustrated above with the signalling theory.

f) Insight on the financial resources of B Corp

The hybrid model, by being out of the norms, can make the access towards financial capital difficult (Choi & Gray, 2008). In fact, traditional financing instructions may lack knowledge about the certification (Paelman et al., 2022).

B Corp certified companies finance through different organizations (Paelman et al., 2022):

- Themselves, with internal financing, which consists of the major financing sources,
- COVID loans, especially when a B Corp found its internal financing insufficient,
- Governmental support, thanks to subsidies or concessional financing
- Banks, through loan or credit facility,
- Leasing, but for minor assets,
- External (impact) investors, through an equity participation,
- Convertible debt, secured from an external investor, and
- Participation certificates, thanks to the legal form of a cooperative.

While some B Corp companies expressed their difficulties to have access to these financing facilities, others have also refused financing proposals. Indeed, they stated that the financing organisation were either opposite to their values or could contribute to a mission drift, due to the obligation to reach a certain financial performance. The mainly cited organisations were banks or external investors. Some B Corp changed their banks to guarantee a more sustainable oriented loan. Such a choice in the financing organisation is made thanks to the certification, as claimed by some certified companies: banks and external investors were attracted indeed (Paelman et al., 2022).

The latter is appreciated as they are eager to lower their financial return expectations, but no generalisation can be made as other impact investors were assessed 'greedy for money' (Paelman et al., 2022).

The liquidity statement of a B Corp is impacted by his mission: some certified companies does not distribute profits, some other donate a percentage to charity or non-profit organizations, or allow discounts to those (Paelman et al., 2022).

3. Hypothesis

This research aims at detecting whether, the fact of being a B Corp brought additional protection during the COVID crisis. The research focuses especially on the change in companies' liquidity in Belgium and in some specific sectors, cited in the Appendices and in the next section. Therefore, the hypothesis may be written as follows:

H1: B Corp certified firms had on average a better liquidity position during the COVID-19 era than non-certified B Corp.

As we highlighted in the literature review, we found no paper combining the three concepts of liquidity, CSR and the pandemic. Especially, some author (Wasiuzzaman et al., 2021, for instance) determined that liquidity drove an impact *on* the CSR performance while the opposite direction was explored with qualitative research (Giese et al., 2019, for instance). We found some proxies to seize any potential effect of being sustainable on the liquidity. For example, we explored the impacts on solvency, on credit risk, on stock return ... But no paper defined a clear-cut answer to the veracity of our hypothesis.

4. Empirical Study

A. Sample and data collection

In order to test the above hypothesis, we retrieved several variables from Orbis including firms' current, liquidity ratio and working capital (dependent variable) as well as solvency ratio, intangible fixed assets, tangible fixed asset, cash and cash equivalent, capital, loans & short-term debt, cash flow, return on assets, size category, and year of incorporation. Orbis is a platform regrouping 170 data providers and hundreds of sources from Bureau Van Dijk, giving information of more than 46 billion companies around the globe. The data is standardized and supervised by controls to provide comparable information (*Orbis | Bureau van Dijk*, n.d.).

The list of B Corp companies is obtained from the B Lab which provided to us a complete list of all B Corp across the globe. Companies' names, countries, sector of activity and other information were provided through an Excel Spreadsheet, sent by the B Lab. A total of 6,131 companies had obtained their B Corp certification at the second Quarter of 2023, out of which 52 were in Belgium, 197 in the Netherlands and 6 in Luxembourg.

The initial sample consists of 82,346,526 companies on Orbis. The sample was then narrowed to the Benelux region. All companies that did not have a least one data regarding their liquidity, current ratio and working capital, solvency ratio, intangible fixed assets, tangible fixed asset, cash and cash equivalent, capital, loans & short-term debt, cash flow, return on assets, size category, or year of incorporation between 2017 and 2021 were excluded. The banking sector was also excluded due to the differences in their balance sheet structure, as well as public authorities, states, or governments.

Based on those filters, we studied the NACE code of the remaining B Corp and filtered non-B Corp companies accordingly. Thus, we focused on sectors where B Corps were the most active, that is to say: Other processing and preserving of fruit and vegetables; Manufacture of cocoa, chocolate and sugar confectionery; Distilling, rectifying and blending of spirits; Manufacture of soft drinks; production of mineral waters and other bottled waters; Manufacture of instruments and appliances for measuring, testing and navigation; Installation of industrial machinery and equipment; Wholesale of other food, including fish, crustaceans and molluscs; Wholesale of other household goods; Retail sale in non-specialised stores with food, beverages or tobacco predominating; Other retail sale of food in specialised stores; Passenger air transport; Other software publishing; Motion picture, video and television programme production activities; Computer programming activities; Activities of holding companies; Other activities auxiliary to financial services, except insurance and pension funding; Legal activities; Public relations and communication activities; Business and other management consultancy activities; and Combined office administrative service activities.

We noticed at this stage that Dutch and Luxembourgish companies did not represent a large amount in the dataset. For both countries, only 2,544 observations are present (2.85% of the sample), with only 2 B Corp. Thus, we decided to narrow our sample to Belgian companies.

The sample comprises 21,638 companies, of which 33 B Corp remained, for a total of 86,552 observations. We also noticed the absence of data in some observations after the extraction from Orbis. Missing data related to a company and a specific year was deleted, leading to a final sample of 66,817 observations. The 132 observations of B Corp fall to 98 with this operation. We noted that applying the last operation on Dutch and Luxembourgish companies led to 107 observations in total, with no B Corp.

B. Model and variables

To detect if B Corp presented any sign of better liquidity position as our hypothesis states, we estimated a model with the ordinary least squares on the software RStudio. The following model emerged:

$$\begin{aligned} \text{CURR}_{i,t} = & \beta_1 + \beta_2 \text{BCorp}_i + \beta_3 \text{SOLV}_{i,t-1} + \beta_4 \text{INTA}_{i,t-1} + \beta_5 \text{TFA}_{i,t-1} + \beta_6 \text{CASH}_{i,t-1} \\ & + \beta_7 \text{CAP}_{i,t-1} + \beta_8 \text{LOAN}_{i,t-1} + \beta_9 \text{CASHFLOW}_{i,t-1} + \beta_{10} \text{ROA}_{i,t-1} \\ & + \beta_{11} \text{Size_factor}_{i,t} + \beta_{12} \text{Age}_{i,t} + \beta_{13,t} \text{Year_factor}_i + \beta_{14,t} \text{BCorp}_i \times \text{Year_factor}_i \\ & + \varepsilon_i \end{aligned}$$

Where:

- β_1 is the constant of the equation.
- t is the year, $\forall t = 2018, 2019, 2020, 2021$
- i is the observation, $\forall i = [1; 66,817]; i \in \mathbb{N}$.
- ε_i is the residuals of the model.

a) Dependent variable

The dependent variable of our model measures the liquidity position of the company. For that, we use the current ratio provided by Orbis which is computed as:

$$\text{Current ratio}_{i,t} = \frac{\text{Current asset}_{i,t}}{\text{Current liabilities}_{i,t} + \text{adjustment account}_{i,t}}$$

b) Independent variables

Our independent variables are BCorp (2), and especially BCorp* Year_factor (14). The former is a dummy variable that takes 1 if the firm received its certification, 0 otherwise. The latter will especially measure any effect of the B Corp through year. The Year_factor variable measures any average move in the current ratio of the entire sample, so that the variable (14) will measure if there is a difference during the emergence of the pandemic for B Corp.

Kanchel et al. (2023) pointed out the importance of *when* CSR firms adopted their sustainable policy. Indeed, the author discovered that companies adopting CSR policies at the outbreak of the crisis were less affected in their stock prices, followed by CSR adopters (companies that already adopted CSR policies before the outbreak) and eventually by non-adopters. As this may represent a limit in our study, we decided to follow the theory of Paelman et al. (2020) citing Parker et al. (2019): "certification is a lengthy process where the exact date of certification is random, causing the difference in properties that determine certification to be non-systematic between the treatment and the control group." In other terms, the certified firm had already benefited from its CSR practices before the date of certification, because the practice is over time and the certification at a point of time. In consequence, we decided to consider a firm as being certified for the whole period of 2018 to 2021, regardless of the first certification.

c) Control variables

Then, we took those following control variables:

- (3) $SOLV_{i,t-1}$ captures the solvency ratio of the observation i during the precedent year, which is calculated as $SOLV_{i,t-1} = \frac{Debt_{i,t-1}}{Total\ asset_{i,t-1}}$.
- (4) $INTA_{i,t-1}$ measures the amount of intangible fixed asset in thousand euros of the observation i during the precedent years.
- (5) $TFA_{i,t-1}$ measures the amount of tangible fixed asset in thousand euros of the observation i during the precedent years.
- (6) $CASH_{i,t-1}$ represents cash and cash equivalent in thousands of euros of the observation i during the precedent year.
- (7) $CAP_{i,t-1}$ represents the amount of capital in thousands of euros of the observation i during the precedent year.
- (8) $LOAN_{i,t-1}$ represents the amount of loan and short-term debt in thousands of euros of the observation i during the precedent year.
- (9) $CASHFLOW_{i,t-1}$ captures the cash-flow before D&A (Depreciation and Amortization) in thousands of euros of the observation i during the precedent year.
- (10) $ROA_{i,t-1}$ is the ratio of return on asset using profit or loss before tax of the observation i during the precedent year, such as $ROA_{i,t-1} = \frac{Revenue_{i,t-1}}{Total\ assets_{i,t-1}}$.
- (11) $Size_factor_{i,t}$ is a qualitative variable of the observation i that takes the following values: small company, Medium Company, Large Company, or Very large Company.
- (12) $Age_{i,t}$ measures the age of the company of the observation i , computed as $Year_{i,t} - Date\ of\ incorporation_i$.
- (13) $Year_factor_i$ is a qualitative variable of the observation i that sends the date of the record: 2018, 2019, 2020, or 2021.

C. Descriptive statistics

At first, we conducted an analysis on the minimum and maximum of each variable. We decided to exclude all data that did not satisfied the following criteria:

$$0 \leq CURR_i \leq 100 ; 0 \leq B\ Corp_s_i \leq 1 ; -100 \leq SOLV_i \leq 100 ; 0 \leq INTA_i ; 0 \leq TFA_i ;$$

$$0 \leq LOAN_i ; -100 \leq ROA_i \leq 100$$

We found the presence of inconsistent data regarding the age of the companies. Indeed, the maximum age a companies present in the sample was equal to 2020. A 2020-years old firm is unimaginable and we investigate to find out that 19 observations with a date of incorporation equal to 0 are present in the sample. In that case, we chose to remove those 19 observations. After the deletion, the descriptive statistic is observable in Table 2.

Variable	Minimum	Median	Mean	Maximum	Standard deviation
CURR	0.000	1.375	2.912	99.005	6.288
B Corp	0.000	0.000	0.001	1.000	0.038
SOLV	-99.98	34.14	36.22	100.000	32.280
INTA	0.000	0.000	528.90	875845.000	10799.68
TFA	0.000	74.00	1672.00	3502268.000	26068.54
CASH	0.000	101.80	1773.70	1882618.700	18741.24
CAP	-58.00	20.00	3014.00	4340910.00	52394.05
LOAN	0	16.90	832.70	1225503.00	15139.10
CASHFLOW	-360840.30	67.40	756.00	1518488.00	15003.09
ROA	-99.988	5.302	8.163	99.998	18.927
Age	1.00	12.00	15.24	113.00	11.850
Number of Observation	66,798				

Table 2: Summary statistics without outliers.

For the period between 2018 and 2021, the average current ratio of corporate companies within Belgium rises to 2.912 which is positive. Indeed, the ratio should ideally be above 1, which means that the firm has the ability to meet its short-term obligations. The equilibrium between its current liabilities and its current assets is unbalance in favour of the current assets.

The mean of B Corp is very low due to their poor representation in the dataset (0.14%). Only 98 observations are present in the dataset, thus explaining also the low standard deviation of 0.038.

Regarding the solvency ratio, the mean reach 36.22%. This implies that the average company can self-finance itself, which is considered positive. In other words, companies have on average 36.22% of debt in the total of their liabilities.

Regarding the intangible fixed asset, the median equals zero, meaning that at least half of the observations have a total absence of intangible asset. However, the mean equals 528.90 thousand euros, meaning that firms that own intangible asset have a large amount of those type of fixed asset.

The variable TFA representing the amount of tangible fixed asset has a mean of 1,672,000 euros but with a large standard deviation, implying that there is a high concentration of observation with zero tangible asset. However, for companies that have a tangible asset in their balance sheets, the asset has a large valuation.

The opposite pattern is observable with cash. In fact, more than 1,806 observations are lower than 1,000 euros of cash. This represents 2.08% of the observations that encounter very low level of cash. The mean equals 1,773,700 euros with a maximum reaching 1,882,618,700 euros, leading to a large standard deviation (18,741,240 €).

Regarding the amount of capital, the average firm has a capital up to 3,014 thousand euros. We notice the presence of a single firm (thus, equal to 4 observations) that has a negative capital in its financial statements, thus explaining the minimum of -58,000 € in the data.

Belgian firms have on average 832,700 euros of loans and short-term debts in their balance sheet during the 2017-2020 period. 21,449 observations have no loans or short-term debt, which represent around 5,632 companies that did not indebt themselves on the short-term.

Still, we notice the presence of 8,465 cases of cash-drains (i.e., negative cash flow) between 2017 and 2020. The mean equals 756,000 euros of cash generated with a median of €67,400, meaning that a few observations have large amount of cash-flow.

14,364 observations suffered from a negative return on asset, in which 8,119 have also a negative cash-flow. Yet the average firm has a return of 8.16% on its assets with a standard deviation of 18.927.

Finally, the average age of companies between 2018 and 2021 is 15.24 years, with the presence of firms that disclosed their first financial statements and the oldest reaching the age of 113 years.

D. Assumptions check on the model.

In order to use the linear regression, some statistical assumptions must be reviewed: linearity, multi-collinearity, homogeneity, and normality of the residuals.

Before getting forward, a first linear model was designed. However, the homogeneity assumption was violated. By analysing the studentised residuals, we discovered the presence of 999 residuals that were below -3 or above +3. According to IBM Corporation (2023), those may be considered as outliers. We decided to remove the 999 outliers to ensure the compliance with the assumptions. For all linear regression of the current ratio, the new data set without the outliers is used.

a) Multi-Collinearity

Regarding the multi-collinearity, the function VIF (i.e., variance inflation factor) on RStudio was used. The following results emerged:

	GVIF	Df	GVIF ^{1/(2*Df)}
BCorp	4.456325	1	2.111001
SOLV	1.127709	1	1.061937
INTA	1.479652	1	1.216409
TFA	1.424335	1	1.193455
CASH	1.418593	1	1.191047
CAP	1.299920	1	1.140140
LOAN	1.331011	1	1.153694
CASHFLOW	1.171132	1	1.082188
ROA	1.096891	1	1.047326
Size_factor	1.311166	3	1.046188
Age	1.090146	1	1.044101
Year_factor	1.007061	3	1.001173
BCorp:Year_factor	4.470036	3	1.283468

Fig 7: VIF of the main model.

Source: made by us on RStudio.

The GVIF should be under 2. We decided to ignore the high GVIF of the variable B Corp and BCorp:Year_factor as the latter is formed by the former.

b) Independence of the residuals

In addition to the multi-collinearity assumption, the independence of the residuals should be driven. This was performed through the Durbin-Watson Test. The statistic indicates a value of 1.997 and the p-value for the model was equal to 0.72. A slight interdependence of residual may be observed as the statistic should equal 2, in this case, there is a slight positive auto correlation. Moreover, the p-value of the Durbin-Watson test should be above 0.05, which is the case in this linear regression.

c) Correlation Matrix

The figure 8 illustrates how correlated are the different variables. This was performed thank to the correlation matrix of Pearson with the function cor() on RStudio.

	BCorp	CURR	SOLV	INTA	TFA	CASH
BCorp	1.000000e+00					
CURR	-2.583707e-03	1.000000000				
SOLV	2.173530e-04	0.502796667	1.000000000			
INTA	-1.612368e-05	-0.011022471	0.007694556	1.000000e+00		
TFA	-1.398232e-03	-0.008850713	0.011241921	4.869940e-01	1.000000000	
CASH	1.719599e-02	0.023969886	0.016658592	2.589490e-01	0.317840933	1.000000000
CAP	2.385093e-03	0.017284593	0.044976368	3.352046e-01	0.193213162	0.31794797
LOAN	5.414896e-03	-0.010388127	0.003962582	3.354148e-01	0.296032998	0.37679298
CASHFLOW	3.302101e-04	0.006532963	0.022819308	2.530785e-01	0.213569114	0.30305496
ROA	-9.348750e-03	0.117773469	0.269497430	-1.607161e-02	-0.015542913	-0.01306775
Age	-2.040709e-03	0.096657345	0.169781164	1.750803e-02	0.052349976	0.08702129
		CAP	LOAN	CASHFLOW	ROA	Age
BCorp						
CURR						
SOLV						
INTA						
TFA						
CASH						
CAP	1.000000000					
LOAN	0.350409546	1.000000000				
CASHFLOW	0.257360032	0.177948448	1.000000000			
ROA	-0.018332131	-0.015716984	0.0302959733	1.000000000		
Age	0.029401746	0.041662959	0.0506605163	-0.05087868	1.000000000	

Fig 8: Correlation Matrix of Pearson.

Source: made by us on RStudio.

A correlation appears once the threshold of 0.5 is by passed. Overall, no variable is highly correlated, positively or negatively, with the exception of the solvency ratio. Yet, we will analyse deeper the sign of the relations among the variables.

At first, the dummy variable B Corp is poorly correlated with the financial measures. Still, the variable has a positive relation with the solvency ratio, the amount of cash, the amount of capital, the amount of loan and short-term debts and the generated cash flow. At the opposite, the B Corp variable is negatively correlated with the current ratio, the amount of intangible asset, the amount of tangible asset, the return on asset before tax and the age of the firm.

Secondly, the current ratio seems to be positively correlated with the solvency, the amount of cash, the amount of capital, the generated cash flow, the return on asset of the last year and the age of the firm. On the contrary, the current ratio is negatively correlated with the amount of intangible asset, the amount of tangible fixed asset, the loan and short-term debts of the last year.

The relation between solvency and current ratio may be explained by Myers et al. (1984) who interpreted that a high level of leverage (thus, an increase in the solvency ratio) creates a state of uncertainty about access to future debt. To protect themselves from this state, the executives prefer to hold more liquidity (thus, an increase in the current ratio).

Moreover, the negative relation between short-term debts and current ratio is explainable thank the formula of the current ratio. Indeed, the current liabilities are in the denominator of the ratio, which means that an increase of loans or short-term debts induces a decrease in the current ratio's value. The correlation is not perfect as there is a lag of one year between the current ratio and the short-term debts and loans.

Regarding the solvency, the ratio is positively correlated with all the variables, and the highest correlation is observable with the return on assets. The positive relation between cash and solvency was already pointed out in a paper written by Gamba et al. (2020).

Then, the amount of intangible asset is positively correlated with the amount of tangible asset, the amount of cash, of capital, of loans and short-term debts, of cash flow and with the age (+1 year) of the company. The only negative relation is noticeable with the return on asset.

The amount of total fixed asset is correlated positively with the amount of cash, the amount of capital, the amount of short-term debts and loans, the generated cash-flow and the age (+1 year), while the variable is negatively correlated with the return on asset.

In both intangible and tangible fixed asset, the correlation is consistent with the short-term debt, and the equity. Indeed, their acquisition may require the firm to subscribe to a loan (of which a specific amount will be classified as short-term debt) or an increase in equity to finance the acquisition. Thus, an increase of asset is possibly linked with an increase in equity or short-term loan.

The amount of cash has also a negative link with the return on total assets, whereas the variable has a positive one with the amount of capital, the amount of short-term debts and loans, the cash flow and the age of the company. The cause of the positive relation between cash-flow and the amount of cash may be straightforward, especially in light with the concept of 'cash flow sensitivity to cash' (see Almeida et al., 2014). Indeed, firms tend to keep a portion of their generated cash inflow under the form of cash holding.

The negative relation between the intangible fixed asset, the total fixed asset or the amount of cash and the return on asset seem logical, as cash, tangible and intangible fixed asset are all present in the computation of the return on asset. Indeed, the ROA being calculated as: $ROA = \frac{Revenue}{Total\ assets}$, cash and fixed asset are comprised in the total assets, thus, giving a negative relationship.

The Capital has a positive relation with the amount of loans and short-term debt, with the cash-flow and the age (+1 year) of a company but has a negative relation with the return on asset. The same relation is observable between the loans and the cash-flow, the return on asset or the age.

Concerning the generated cash flow, the indicator is positively correlated with both the ROA and the age (+1 year). The former is straightforward, as the computation of the cash flow starts with the net income performed, and only then with the deletion of non-cash incomes and addition of non-cash expenses, thus implying a positive correlation. In other words, generated cash flow and return on asset have in common the revenues in their related computation.

Finally, there is a negative correlation between the return on total asset and the age of the firm (+1 year).

d) Normality

In order to verify that the normality assumption is not violated, an analysis on the residuals is performed. The residuals appear to follow a normal distribution as the figure 9 demonstrates:

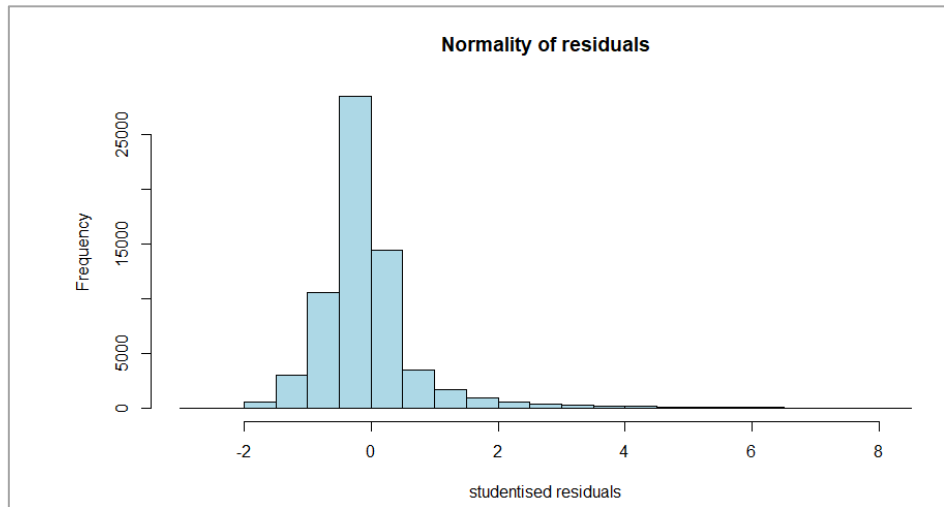


Fig 9: Residuals of the main model.

Source: made by us on RStudio.

Still, we noticed that the tail of the residuals seems slightly longer on the right.

e) Homoscedasticity and Homogeneity

The assumption of homoscedasticity and homogeneity are verified by creating a graph of residuals dispersion. The dispersion should be constant.

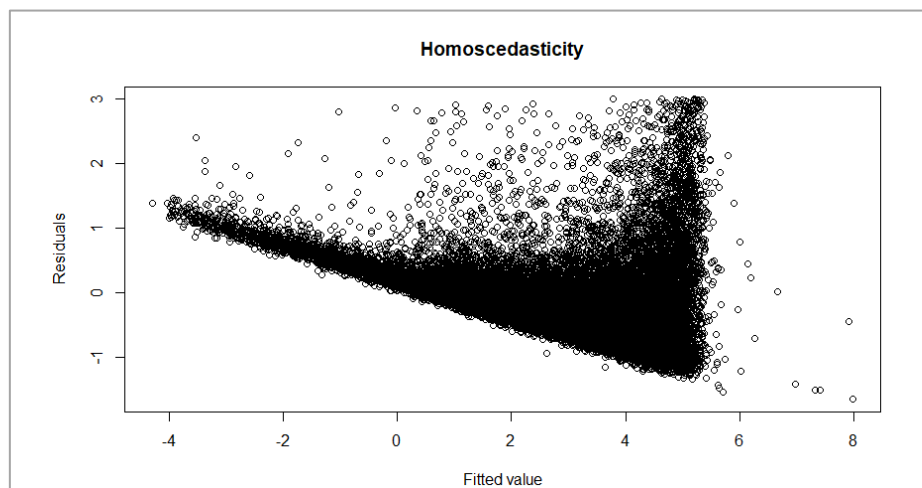


Fig 10: Homoscedasticity of the main model.

Source: made by us on RStudio.

We notice a larger spread in the residuals values once the fitted values are positive. Yet, we assume that the dispersion is constant.

f) Linearity

This assumption is checked by comparing the residuals with the fitted values. Ideally, the residuals should be randomly present around 0.

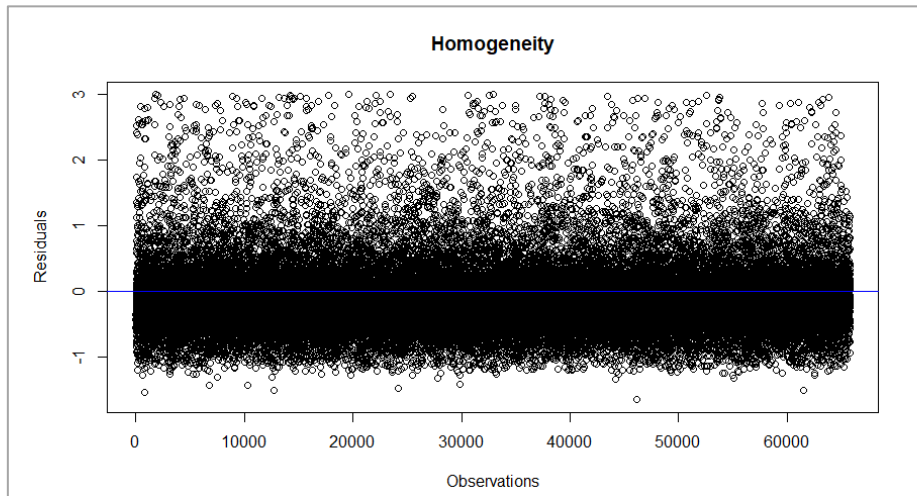


Fig 11: Homogeneity of the main model.

Source: made by us on RStudio.

The linearity assumption is assumed verified.

g) Conclusion on the assumption

We conclude that none of the statistical assumptions are violated.

5. Results

A. Main Model

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	1.892 e-01	4.691 e-02	4.033	5.52 e-05	***
(2)	BCorp	3.036 e-01	5.358 e-01	0.567	0.5709	
(3)	SOLV	4.663 e-02	3.262 e-04	142.935	< 2e-16	***
(4)	INTA	-1.948 e-06	1.094 e-06	-1.780	0.0750	.
(5)	TFA	-1.073 e-06	4.448 e-07	-2.413	0.0158	*
(6)	CASH	8.297 e-06	8.114 e-07	10.226	< 2e-16	***
(7)	CAP	4.609 e-08	2.124 e-07	0.217	0.8281	
(8)	LOAN	-2.393 e-06	7.484 e-07	-3.197	0.0013	**
(9)	CASHFLOW	-7.849 e-07	7.071 e-07	-1.110	0.26703	
(10)	ROA	-3.319 e-03	5.419 e-04	-6.125	9.13 e-10	***
(11a)	Size_factorMedium sized	2.033 e-01	4.257 e-02	4.775	1.80 e-06	***
(11b)	Size_factorSmall	4.146 e-01	4.053 e-02	10.229	< 2e-16	***
(11c)	Size_factorVery large	-3.772 e-01	7.873 e-02	-4.790	1.67 e-06	***
(12)	Age	4.648 e-03	8.633 e-04	5.383	7.33 e-08	***
(13a)	Year_factor2019	6.250 e-02	2.846 e-02	2.196	0.0281	*
(13b)	Year_factor2020	1.125 e-01	2.809 e-02	4.004	6.23 e-05	***
(13c)	Year_factor2021	1.253 e-01	2.784 e-02	4.501	6.79 e-06	***
(14a)	BCorp:Year_factor2019	-6.945 e-01	7.416 e-01	-0.937	0.3490	
(14b)	BCorp:Year_factor2020	-9.065 e-02	7.345 e-01	-0.123	0.9017	
(14c)	BCorp:Year_factor2021	-8.143 e-01	7.216 e-01	-1.128	0.2591	
	R ²	0.2574				
	Adjusted R ²	0.2572				
	F-statistic P-value	< 2.2e-16				
	Observation	65,799				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 3: Summary statistics of the main model.

As table 4 illustrates, the model is significant thanks to a p-value lower than 2.2 e-16. Still, an analysis of each variable is needed as some of them are not significant at the 0.1, 1, 5, or 10% threshold.

We also notice that all betas from the model are quite small (none bypass 1), and the variance of the liquidity ratio is explained up to 25.74 percent only. Therefore, the model, despite being significant, lacks to explain a major part of the variation of the current ratio.

Being a B Corp (2) has a positive impact on the current ratio. However, this statement should be taken cautiously as the p-value is 57.09%. This is presumably due to the scarcity of B Corp present in our sample: 98 observations of B Corp, representing 0.14% of the sample. The cross section between B Corp and the factor of the year 2020 (14b) is even less significant. We prevent ourselves to interpret this comparison with the year 2018. Thus, no conclusion could be drawn in the determination of a positive effect between the pandemic outbreak and the certification.

The solvency ratio (3) has a positive effect on the current ratio: for each additional unit of the solvency ratio, the average liquidity ratio improves by 0.046 unit the next year. This effect is highly significant as the p-value is below 2.2 e-16.

The amount of intangible asset (4) has a positive effect at the 10% threshold. We may interpret that a firm purchasing or creating, the precedent year, an intangible asset of €1,000 deteriorates the current ratio by 1.948×10^{-6} unit on average. Similarly, the purchase or the creation of an additional €1,000 of tangible fixed asset (5) leads to the deterioration of the current ratio by 1.073×10^{-6} unit on average the next period. This result hold at the 5% threshold.

The cash (6) drives a positive, yet small, impact on the dependent variable at the 0.1% threshold. This is interpreted as each additional €1,000 kept by the average firm improves the current ratio of the next year by 8.297×10^{-8} unit.

The amount of capital (7) has on average a positive, but insignificant, effect on the current ratio of the next period.

While the current ratio is deteriorated on average by 2.393×10^{-6} unit when firms are taking out a loan (8) of €1,000 the precedent year. This effect is significant at the 1% threshold. We may point out a pattern between loans (8) fixed intangible (4) and tangible assets (5). Indeed, all deteriorate the current ratio of the next year by 10^{-6} units. We may suppose that the acquisition of those assets leads to the same range of deterioration of the current ratio, as the acquisition could imply the creation of a short-term debt, classified as current liabilities in the financial statements (denominator in the current ratio).

Surprisingly, the coefficient of the cash-flow (9) is negative, meaning that every €1,000 of cash generated impacts negatively the following year the current ratio by 7.849×10^{-7} unit. However, this effect is insignificant.

At the opposite, the return on asset (7) deteriorates on average the liquidity position of a firm the next year. In other terms, an additional unit of return on asset worsen the current ratio by 3.319×10^{-3} unit. This pattern is in line with the literature, as increasing liquidity of a firm has a tendency to mitigate the profits, and vice versa (Hristozov, 2021).

Regarding the size of the firms (11), the average small and medium sized firms have a better current ratio than large companies, while very large companies have a lower current ratio on average than large companies. All three effects are significant at the 0.1% threshold.

The age (12) of a company plays also a small role in the determinant of the current ratio. Indeed, the older the firm, the better its liquidity position. To rephrase, one additional year to the company's history improves the current ratio by 0.004 unit. This effect is significant at the 0.1% threshold.

Unexpectedly, the year 2020 (13b) is seen with a better current ratio than in 2018, and that effect is significant at the 0.1% threshold. A possible interpretation may be due to the outcome noticed by Almeida (2020): the company Ruth withdrawn more cash than its immediate need, probably to forecast future scarcity. The same pattern could have been performed by the average company in Belgium when facing the first month of the pandemic. Furthermore, Baum et al (2017) pointed out the increase of level of cash for firms, when uncertainties arise. We can consider the pandemic as triggering many uncertainties for executives. The fact that the p-value is much lower for 2020 than for 2019 may be interpreted as an effect identified by Baum et al. (2017):“ [Our results are in accordance with] Baum et al. (2006) who predict that during periods of higher uncertainty firms behave more similarly in terms of their cash-to-asset ratios.”

B. Model across sectors

According to the scientific literature, the effect of the pandemic has a heterogenic effect on sectors. Indeed, Sectors highly impacted are hospitality (McGeever et al., 2020) wholesale and retail, art, transport (Guerini et al., 2020; Demmou et al., 2021; McCann et al., 2020), electricity production (Shevchenko, 2020) sectors. At the opposite, construction, information and communication (McGeever et al., 2020) have seen a neutral impact. The Online shopping sector has seen an increasing demand, that was blocked partially by the transport sector, which was heavily affected (Auzuña-Emsiña et al., 2021).

Thus, due to this heterogeneity, an analysis on the sectors should be performed. To do so, we sorted the affected and the non-affected sector according to the papers above. We summarized our process in the appendices 10A.

a) Neutral impacted sectors

Regarding sectors that have been identified as neutrally impacted by the outbreak of the pandemic, we created a sub sample for the following analysis. The sub sample consists of 13,487 observations, in which 31 B Corp are present. The variable CURR has a minimum of 0 and a maximum of 24.522, a mean of 2.199 and a standard deviation of 2.5669.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	3.482 e-01	8.611 e-02	4.043	5.30 e-05	***
(2)	BCorp	-1.236 e+00	8.931 e-01	-1.473	0.1407	
(3)	SOLV	4.048 e-02	6.261 e-04	64.561	< 2e-16	***
(4)	INTA	-9.573 e-06	4.107 e-06	-2.331	0.0197	*
(5)	TFA	1.157 e-05	5.385 e-06	2.148	0.0317	*
(6)	CASH	1.729 e-05	3.502 e-06	4.938	7.99 e-07	***
(7)	CAP	3.403 e-06	1.606 e-06	2.119	0.0341	*
(8)	LOAN	1.890 e-06	3.286 e-06	0.575	0.5651	
(9)	CASHFLOW	9.785 e-07	1.210 e-06	0.809	0.4185	
(10)	ROA	-5.574 e-03	8.885 e-04	-6.273	3.65 e-10	***
(11a)	Size_factorMedium sized	3.431 e-01	7.829 e-02	4.382	1.18 e-05	***
(11b)	Size_factorSmall	4.190 e-01	7.392 e-02	5.668	1.47 e-08	***
(11c)	Size_factorVery large	-6.102 e-01	1.889 e-01	-3.231	0.0012	**
(12)	Age	2.882 e-03	1.679 e-03	1.717	0.0860	.
(13a)	Year_factor2019	3.426 e-02	5.579 e-02	0.614	0.5391	
(13b)	Year_factor2020	1.307 e-01	5.488 e-02	2.382	0.0172	*
(13c)	Year_factor2021	8.109 e-02	5.434 e-02	1.492	0.1356	
(14a)	BCorp:Year_factor2019	6.251 e-01	1.147 e+00	0.545	0.5858	
(14b)	BCorp:Year_factor2020	8.031 e-01	1.148 e+00	0.700	0.4841	
(14c)	BCorp:Year_factor2021	6.028 e-01	1.148 e+00	0.525	0.5994	
	R ²	0.257				
	Adjusted R ²	0.256				
	F-statistic P-value	< 2.2e-16				
	Observation	13,487				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 4: Summary statistics of the regression model containing the neutral impacted sectors.

Overall, the model is significant with the p-value of the F-statistic lower than 2.2 e-16. The multiple R-squared is a bit lower than the main model, but still explains up to one quarter of the total variance.

Regarding our main hypothesis, the coefficient of the B Corp (2) and their cross section with years (14) have insignificant results. However, between 2019 and 2021, it seems that B Corp experienced a superior current ratio on each year than in 2018. We prevent ourselves to hold the analysis as the p-values are above the 10% threshold for both coefficient (2) and (14).

The solvency ratio (3) keeps the same effect on the current ratio the following year as the main model, with a decrease of the current ratio by 0.04 unit each time the solvency ratio increased by 1 unit the past year.

In this sub sample, the amount of intangible asset (4) impacts stronger the current ratio the next year than in the main model and this result is more significant (5% threshold against 10% for the main model). Indeed, the purchase or the creation of €1,000 of intangible fixed asset led to a deterioration of 9.573×10^{-6} unit of the current ratio, on average the following year.

Interestingly, the coefficient (5) has turned out positive, at the opposite with the main model. This means that the sale of €1,000 of tangible fixed asset will worsen the current ratio by 1.157×10^{-5} unit the next year. This effect is significant at the 5% threshold.

The effect that cash (6) drives on the current ratio of the next year has become twice stronger in this sub sample, under the 0.1% threshold. In other terms, it means that in the neutrally impacted sector, cash has a more positive effect on the current ratio of the next year than in the whole sample. We suppose that the proportion of cash out of the current assets is larger in the firms present in those sectors.

One additional measure that those sectors could have benefited from is the effect of the capital (7) on the current ratio of the next year. Indeed, an increase of €1,000 of capital the precedent year led to a 3.403×10^{-6} unit improvement of the current ratio. This effect is significant, as the p-value equal 3.413%.

Regarding the coefficient of the cash-flow (9), the short-term debt and loans (8), the coefficient becomes insignificant on any effect on the current ratio of the next year.

At the opposite of the main model, sectors that were neutrally impacted by the pandemic have suffered more on the negative effect driven by the return on asset (10) than the average company in our main sample. Indeed, a 1 point of percentage increase of the return on asset the precedent year worsens the current ratio by 0.005 unit. In comparison, the average of the main model worsens the ratio by 0.003 unit. This effect is statistically significant at the 0.1% threshold.

As in the main model, a size-effect (11) on the current ratio occurs. However, the only noticeable difference is about the medium sized firms, which have a bigger advantage in comparison with large companies, than the main model. In other terms, companies that were neutrally affected by the pandemic have on average a 0.343 better current ratio than large companies, while the medium companies from the whole sample have a 0.203 better current ratio than large companies. This effect is highly significant. At the opposite, the coefficient for very large sized companies with neutral effect from the COVID worsens by 2.33 unit in comparison with the main model.

Regarding the age of companies (12), the effect is less significant (from 0.5% threshold to 10% threshold in the current model) and twice weaker on the current ratio.

Eventually, the pattern noticed in the main model of the current ratio through years (13) nearly disappears in the statistical significance. This effect is surprising as the sub sample should not be harmed by the outbreak of the pandemic. Indeed, we expected less variation of the current ratio.

b) Negatively impacted sectors

In this section, we will analyse the sectors that have been hit severely by the pandemic according to the literature. The sub sample consists of 16,547 observations, out of which 29 B Corp are present. The current ratio, on average, equal 1.922 with a standard deviation of 2.1389, and oscillates between 0.001 and 24.828. All in all, we already notice that the current ratio has a lower value than in the neutrally impacted sectors. In addition, the standard deviation is lower, meaning that the current ratio is also more concentrated around the mean than in the previous sub sample.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	4.233 e-01	7.268 e-02	5.825	5.82 e-09	***
(2)	BCorp	1.890 e+00	6.770 e-01	2.791	0.0052	**
(3)	SOLV	3.737 e-02	4.951 e-04	75.484	< 2e-16	***
(4)	INTA	8.393 e-05	2.928 e-05	2.866	0.0041	**
(5)	TFA	-3.189 e-05	3.479 e-06	-9.164	< 2e-16	***
(6)	CASH	2.775 e-06	1.716 e-06	1.617	0.1058	
(7)	CAP	-2.858 e-06	6.966 e-07	-4.103	4.09 e-05	***
(8)	LOAN	1.344 e-05	3.813 e-06	3.526	0.0004	***
(9)	CASHFLOW	-7.175 e-06	3.326 e-06	-2.157	0.0309	*
(10)	ROA	-7.487 e-03	9.231 e-04	-8.111	5.38 e-16	***
(11a)	Size_factorMedium sized	2.346 e-01	6.718 e-02	3.491	0.0004	***
(11b)	Size_factorSmall	2.401 e-01	6.437 e-02	3.730	0.0001	***
(11c)	Size_factorVery large	2.603 e-01	1.663 e-01	1.565	0.1176	
(12)	Age	8.923 e-03	1.080 e-03	8.263	< 2e-16	***
(13a)	Year_factor2019	6.275 e-02	4.010 e-02	1.565	0.1176	
(13b)	Year_factor2020	1.599 e-01	3.969 e-02	4.028	5.64 e-05	***
(13c)	Year_factor2021	1.374 e-01	3.957 e-02	3.473	0.0005	***
(14a)	BCorp:Year_factor2019	-3.178 e+00	9.565 e-01	-3.322	0.0008	***
(14b)	BCorp:Year_factor2020	-7.456 e-01	9.567 e-01	-0.779	0.4357	
(14c)	BCorp:Year_factor2021	-2.697 e+00	9.262 e-01	-2.911	0.0036	**
	R ²	0.3027				
	Adjusted R ²	0.3019				
	F-statistic P-value	< 2.2e-16				
	Observation	16,547				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 5: Summary statistics of the regression model containing the most affected sectors.

Globally, the model of companies that have been negatively impacted by the pandemic is significant with a p-value below 2.2 e-16. The Multiple R squared statistic equals 30.27%, which is the portion of the variance of the current ratio that is explained thank our model.

On average, during the four-year period, B Corp (2) had a better current ratio of about 1.89 unit in comparison with the non-B Corp companies. This statement is significant at the 1% threshold. However, we notice a decrease of the current ratio of the B Corp in 2019 and 2021 in comparison with the year 2018, as the coefficient (14a) and (14c) shows a negative current ratio on average for B Corp during the related years. In other terms, we may suppose that B Corp had a better current ratio during the four years than non-B Corp, but with a decreasing value. The decreasing value of the current ratio is not noted in the whole sample through the years (13).

The solvency ratio (3) has a smaller positive effect on the current ratio of the next year in those harmed sectors, on average. In other terms, while an increase by 1 point of percentage of the solvency ratio

improved the current ratio by 0.046 in the main sample, the same increase improves the current ratio by 0.037 unit the next year for this sub sample. This effect is significant at the 0.1% level.

The current model displays a positive and significant effect of the amount of intangible asset (4) on the current ratio. Indeed, the sale of €1,000 of intangible asset leads to an $8,393 \text{ e-}05$ unit decrease of the current ratio the next year. At the opposite, the two previous model had a negative, but less significant, impact of the intangible asset on the current ratio.

In the negatively affected sectors, the effect of the tangible fixed asset (5) is stronger on the current ratio than the main model, and more significant too. In fact, the coefficient (5) equal $-3.189 \text{ e-}05$ with a p-value lower than $2 \text{ e-}16$.

The effect of the amount of cash (6), at the opposite of the average firm of the full sample, becomes insignificant on the current ratio for this sub sample.

Again, contrary to the main model, the effect of the capital (7) becomes negative toward the current ratio of the next year. An increase of €1,000 of capital leads to a decrease of $-2.858 \text{ e-}06$ unit of the current ratio the next year, while the same increase would have improved the current ratio of the next year by $3.403 \text{ e-}06$ unit in the neutrally impacted sectors. The coefficient (7) is highly significant at the 0.1% threshold.

Regarding the amount of short-term debt and loans (8), each new take out of €1,000 would improve on average the current ratio by $1.344 \text{ e-}05$ unit the next year. This improvement is significant at the 0.1% threshold. We notice that, again, the main model indicates an opposite effect of the loans and short-term debts on the current ratio ($4,609 \text{ e-}08$). Indeed, those results seem surprising as short-term debts and loans have a tendency to decrease the value of the current ratio, due to their presence in the denominator.

The generated cash flow (9) has a negative impact on the current ratio of the next year. This effect is more significant and ten times stronger than in the main model, suggesting that the generation of €1,000 of cash influenced the current ratio by $-7.175 \text{ e-}06$ unit the next year, on average.

Then, the negative effect of the return on asset (10) on the current ratio of the next year doubles in this sub sample. Indeed, an increase of one point of percentage of the return on asset worsens the current ratio by $7.487 \text{ e-}03$ unit the next year, on average. This effect is significant at the 0.1% threshold.

Size of the company (11) plays also a role in the current ratio: in fact, in comparison with large companies, small and medium companies have on average a better liquidity position. This statement is significant at the 0.1% threshold. We prevent ourselves to interpret the difference between large and very large companies as the effect is positive (at the opposite of the previous models) but insignificant.

Another variable that matters in the influence on the current ratio is the age of the firm (12): the older the firm, the better the liquidity position. Indeed, the coefficient (12) equals $8.923 \text{ e-}03$ and is significant at the 0.1% threshold.

Eventually, an increase of $1.599 \text{ e-}01$ unit of the current ratio is noticeable in 2020 compared to 2018, on average. Thus, despite being classified as sectors being negatively affected by the COVID, the average firm held a better evolution of the current ratio than sectors neutrally affected on average, and during 2020 and 2021.

c) Conclusion on the sectors

Companies certified B Corp have on average a better current ratio when the sector is negatively impacted by the COVID. These results hold at the 1% threshold. Yet, we found no evidence that the certification buffered the negative effect at the outbreak of the pandemic and above all, the certification had worsened the current ratio the second year of the COVID. Otherwise, in neutrally affected sectors, we found no evidence that the B Corp certification had improved the liquidity position of the firm, on average and during the pandemic.

C. Model regarding the liquidity position of the firm

For the present section, we will sort the observations into two families: the first one represents observations that suffer from an illiquid position, while the second one will benefit from a liquid position. In other terms, we will sort observations regarding their current ratio: those with a current ratio between 0 and 1 are classified as illiquid, and those with a current ratio above 1 are classified as liquid.

a) Illiquid firms

19,026 observations have a current ratio that oscillates between 0 and 1. The mean of the ratio equals 0.5952 while the median equals 0.6390 with a standard deviation of 0.2886. In the illiquid firms, 9 B Corp are present at least during one year, which represent a total of 17 observations.

		Coefficient	Std. Error	t value	Pr(> t)	
(1)	(Intercept)	5.914 e-01	9.535 e-03	62.028	< 2e-16	***
(2)	BCorp	1.777 e-01	1.266 e-01	1.404	0.16043	
(3)	SOLV	-7.707 e-04	7.170 e-05	-10.748	< 2e-16	***
(4)	INTA	9.629 e-07	2.359 e-07	4.082	4.48e-05	***
(5)	TFA	-4.635 e-07	1.160 e-07	-3.998	6.42e-05	***
(6)	CASH	2.539 e-06	2.278 e-07	11.149	< 2e-16	***
(7)	CAP	-4.951 e-07	8.541 e-08	-5.796	6.89e-09	***
(8)	LOAN	1.545 e-08	2.127 e-07	0.073	0.94210	
(9)	CASHFLOW	-6.197 e-07	1.351 e-07	-4.587	4.52e-06	***
(10)	ROA	2.714 e-03	1.180 e-04	23.008	< 2e-16	***
(11a)	Size_factorMedium siz	-9.491 e-03	8.712 e-03	-1.089	0.27603	
(11b)	Size_factorSmall comp	1.885 e-02	8.398 e-03	2.245	0.02479	*
(11c)	Size_factorVery large	4.326 e-02	1.675 e-02	2.582	0.00982	**
(12)	Age	-4.847 e-04	1.936 e-04	-2.503	0.01232	*
(13a)	Year_factor2019	5.568 e-03	5.887 e-03	0.946	0.34425	
(13b)	Year_factor2020	7.822 e-03	5.892 e-03	1.328	0.18430	
(13c)	Year_factor2021	1.026 e-02	5.844 e-03	1.755	0.07933	.
(14a)	BCorp:Year_factor2019	1.081 e-02	1.898 e-01	0.057	0.95459	
(14b)	BCorp:Year_factor2020	-6.856 e-02	2.367 e-01	-0.290	0.77211	
(14c)	BCorp:Year_factor2021	8.861 e-02	1.714 e-01	0.517	0.60516	
	R ²	0.0409				
	Adjusted R ²	0.0399				
	F-statistic P-value	< 2.2e-16				
	Observation	19,026				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 6: Summary statistic of the model with illiquid observations.

Overall, the model is significant with a p-value of the F-statistic below 2.2×10^{-16} . However, the R-squared equal 4.09%, which means that the total variability of the current ratio in illiquid firms is explained only by 4.09% of our model.

Regarding the independent variable (2), the p-value is above the 10% threshold, which prevents us to consider the interpretation of the coefficient. Nonetheless, we can notice that the coefficient is positive. Indeed, being certified could improve the current ratio by 0.17 units on average, during the four-year period as far as the current ratio is below 1.

However, we find no evolution of the current ratio of the B Corp, as the least elevated p-value for the cross section between the certification and the years equals 60.5%. In other words, B Corp have on average a better current ratio than non-B Corp (still with a high p-value), but there is no evidence of a progression of B Corp's liquidity position.

We notice some changes between the current model and the main one. We will analyse only the coefficient being above 0.001 unit and significant. The return on asset (10) becomes positive for illiquid firms, and more significant than the main model: indeed, an additional point of percentage of the ROA improves the current ratio by 0.0027 units the next year. This effect is significant at the 0.1% threshold.

Another effect significant at the 1 or 5% is the positive relationship between the current ratio and the comparison with (respectively) very large or small sized companies and large companies. In other words, very large or small sized firms have a better current ratio than large sized companies.

Finally, the current ratio is too wide on each year to determine any time effect, either with or without considering the presence of a certification.

b) Liquid firms

This filter develops 46,773 observations where the current ratio is above 1. The mean of the current ratio in this sub sample equal 2.976 with a standard deviation equal to 3.2038. The median equals 1.804 with its first quartile located at 1.283 and the last one at 3.121. A total of 81 observations are certified B Corp, which represent 26 firms. We notice that some of those firms were not present 4 times in the sub sample. This may be due either by the deletion of outliers, the absence of one year-related observation or the liquidity position of the firm. The results of the regression appears in table 7.

The present model is more accurate as the R squared equals 25.84% in comparison with the model for illiquid firms. The model is also statistically significant as the F-statistic reveals a p-value below 2.2×10^{-16} .

However, we find no evidence that being a B Corp improves the current ratio: the p-value for the average certified firm is above 80%. The same conclusion may be drawn for the cross section with years. The current ratio of B Corp firms is too wide during each four years for liquid companies.

As the precedent model, we will analyse coefficient above the 0.001 unit and significant at least at the 10% threshold. The solvency ratio (3) has a stronger positive effect than in the main model, while still being statistically significant at the 0.1% threshold. The coefficient equals 0.0586 in the current model, and it equals 0.0466 in the main model. Similarly, the return on asset (10) experiences an increasing deterioration on the current ratio than the main model.

At the opposite, sizes of the firms (11) are less significant variables, and their effects on the current ratio are weaker. Indeed, in comparison with the large sized entities, medium companies have an improvement of the current ratio by 0.146 unit (0.203 in the main model), small companies have a

better current ratio by 0.101 unit (0.414), and very large companies have a deteriorated current ratio by 0.524 units (0.377).

Regarding timing effects, the years 2020 and 2021 benefits from the same pattern as the one identified in the main model. That is to say, the current ratio improves by 0.08 units (0.12 in the main model) in 2020 and the ratio improves by 0.107 unit (0.125) in 2021. However, the p-values equal respectively 1.6% (6.23 e-03 %) and 0.3% (6.79 e-04 %).

		Coefficient	Std. Error	t value	Pr(> t)	
(1)	(Intercept)	3.598 e-01	6.400 e-02	5.622	1.89e-08	***
(2)	BCorp	1.113 e-01	6.796 e-01	0.164	0.86993	
(3)	SOLV	5.860 e-02	4.697 e-04	124.750	< 2e-16	***
(4)	INTA	-5.608 e-06	1.754 e-06	-3.198	0.00138	**
(5)	TFA	-1.506 e-06	5.695 e-07	-2.645	0.00818	**
(6)	CASH	6.984 e-06	1.008 e-06	6.928	4.34e-12	***
(7)	CAP	2.719 e-07	2.522 e-07	1.078	0.28100	
(8)	LOAN	-7.560 e-07	9.715 e-07	-0.778	0.43648	
(9)	CASHFLOW	5.430 e-07	1.057 e-06	0.514	0.60742	
(10)	ROA	-7.383 e-03	7.162 e-04	-10.308	< 2e-16	***
(11a)	Size_factorMedium sized	1.461 e-01	5.691 e-02	2.568	0.01024	*
(11b)	Size_factorSmall	1.016 e-01	5.419 e-02	1.874	0.06090	.
(11c)	Size_factorVery large	-5.245 e-01	1.052 e-01	-4.988	6.13e-07	***
(12)	Age	-6.114 e-04	1.119 e-03	-0.546	0.58491	
(13a)	Year_factor2019	4.415 e-02	3.785 e-02	1.166	0.24344	
(13b)	Year_factor2020	8.948 e-02	3.714 e-02	2.409	0.01600	*
(13c)	Year_factor2021	1.078 e-01	3.681 e-02	2.930	0.00339	**
(14a)	BCorp:Year_factor2019	-9.703 e-01	9.242 e-01	-1.050	0.29381	
(14b)	BCorp:Year_factor2020	-2.277 e-01	8.962 e-01	-0.254	0.79946	
(14c)	BCorp:Year_factor2021	-9.751 e-01	9.141 e-01	-1.067	0.28609	
	R ²	0.2584				
	Adjusted R ²	0.2581				
	F-statistic P-value	< 2.2e-16				
	Observation	46,733				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 7: Summary statistic of the model with liquid observations.

c) Conclusion on the difference between illiquid and liquid firms

We sorted our data in a manner that we could perform two models: the first model with illiquid firms ($0 \leq \text{current ratio} \leq 1$) and the second model with liquid firms ($1 < \text{current ratio}$).

We found no evidence that being certified B Corp is linked with a better current ratio, due to high p-values. Yet, we have taken the liberty of analysing the coefficient (2) of the illiquid firms, as the p-value is close (but above) the 10% threshold. The coefficient revealed a slight improvement of the current ratio for the B Corp among the illiquid companies.

Regarding control variables, some changes appeared among the sorted samples.

D. Robustness analysis

a) Liquidity ratio

In order to test our findings, I decided to replace the dependant variable CURR (current ratio) by the liquidity ratio. The liquidity ratio, named LIQU, is also a mean to compute the liquidity position of a company.

The Liquidity ratio is computed as $Liquidity\ ratio = \frac{Current\ assets - stocks}{Current\ liabilities}$

While the regression analysis is designed as follow:

$$\begin{aligned} LIQU_{i,t} = & \beta_1 + \beta_2 BCorp_i + \beta_3 SOLV_{i,t-1} + \beta_4 INTA_{i,t-1} + \beta_5 TFA_{i,t-1} + \beta_6 CASH_{i,t-1} \\ & + \beta_7 CAP_{i,t-1} + \beta_8 LOAN_{i,t-1} + \beta_9 CASHFLOW_{i,t-1} + \beta_{10} ROA_{i,t-1} \\ & + \beta_{11} Size_factor_i + \beta_{12} Age_i + \beta_{13,t} Year_factor_i + \beta_{14,t} BCorp_i \times Year_factor_i \\ & + \varepsilon_i \end{aligned}$$

Where:

- β_1 is the constant of the equation.
- t is the year, $\forall t = 2018, 2019, 2020, 2021$.
- i is the observation, $\forall i = [1; 66,817]; i \in \mathbb{N}$.
- ε is the residuals of the model.

As performed with the main model, all the statistical assumptions were verified. The verification led to the deletion of 1,003 observations with a first regression. The 1003 observations were considered outliers as their studentized residuals were below -3 or above +3 (IBM, 2023). The results of the linear regression are shown in the table 8.

The model is significant in its entirety and explains up to 25.02% of the variance of the liquidity ratio.

As the previous model, we find no evidence that being a B Corp had improved the liquidity ratio on average (2), or during specific years (14). The coefficient (2) is positive but with a p-value of 77.41%, while the p-values of the cross section with years are not lower than 30.95%. In that case, we prevent ourselves to interpret those results.

Regarding the significant coefficients of the control variables that are higher than 0.001, we find the same effects identified in the main model, with some exceptions. Especially, it appears that the return on asset (10) has a twice weaker relation with the liquidity ratio of the next year: the coefficient equals -0.0018 compared to -0.0033 in the main model, but both are significant at the 0.1% threshold. It may not be surprising that the coefficient differs between the two models, as the stocks are not present in the dependent variable anymore, but still present in the return on assets.

Similar to the main model, an effect emerges on the current ratio from the size of the firms (11): small and medium sized companies have better current ratio than large companies, while very large companies have a lower current ratio than large ones.

The age of the companies (12) has also a different result than the one noted in the main model: indeed, an additional year deteriorates the liquidity ratio by 0.0026 unit while improving the current ratio by 0.0046 units. The p-values are respectively 0.0017 and 7.33 e-08.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	1.459 e-01	4.617 e-02	3.161	0.0015	**
(2)	BCorp	1.513 e-01	5.273 e-01	0.287	0.7741	
(3)	SOLV	4.522 e-02	3.212 e-04	140.765	< 2e-16	***
(4)	INTA	-1.930 e-06	1.077 e-06	-1.792	0.0731	.
(5)	TFA	-1.218 e-06	4.377 e-07	-2.783	0.0053	**
(6)	CASH	9.018 e-06	7.987 e-07	11.920	< 2e-16	***
(7)	CAP	1.970 e-07	2.090 e-07	0.943	0.3458	
(8)	LOAN	-2.480 e-06	7.365 e-07	-3.368	0.0007	***
(9)	CASHFLOW	-8.497 e-07	6.960 e-07	-1.221	0.2221	
(10)	ROA	-1.830 e-03	5.333 e-04	-3.431	0.0006	***
(11a)	Size_factorMedium sized	2.198 e-01	4.190 e-02	5.246	1.56 e-07	***
(11b)	Size_factorSmall	3.926 e-01	3.990 e-02	9.842	< 2e-16	***
(11c)	Size_factorVery large	-4.051 e-01	7.749 e-02	-5.227	1.73 e-07	***
(12)	Age	-2.657 e-03	8.496 e-04	-3.128	0.0017	**
(13a)	Year_factor2019	6.319 e-02	2.801 e-02	2.256	0.0240	*
(13b)	Year_factor2020	1.250 e-01	2.765 e-02	4.520	6.20 e-06	***
(13c)	Year_factor2021	1.365 e-01	2.740 e-02	4.983	6.29 e-07	***
(14a)	BCorp:Year_factor2019	-6.009 e-01	7.298 e-01	-0.823	0.4103	
(14b)	BCorp:Year_factor2020	-9.745 e-02	7.228 e-01	-0.135	0.8927	
(14c)	BCorp:Year_factor2021	-7.217 e-01	7.102 e-01	-1.016	0.3095	
	R ²	0.2502				
	Adjusted R ²	0.2500				
	F-statistic P-value	< 2.2e-16				
	Observation	65,795				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 8: Summary statistics of the model regressing the liquidity ratio with the full sample.

b) Liquidity ratio of firms from affected sectors.

As the results are comparable to the main model, we decided to regress a sub sample in which only firms present in negatively affected sectors are present. The current model is performed in order to support the findings of the previous regression concerning affected companies. Overall, the model explains up to 24.56% of the variation of the liquidity ratio and the p-value of the F-statistic is significant. In comparison with the related sub model, the R-squared is lower by nearly 5 points of percentage. That is to say, the current model explains less the variance of the liquidity ratio than the variance of the current ratio. The results of the regression appears in table 9.

Overall, the model is significant as the p-value of the F-statistic is lower than 2.2e-16. 16,561 observations are present, representing 14 additional observations compared to the precedent related sub sample.

Interestingly, the certification brings to B Corp a 1.58 increase in their liquidity ratio than non-certified firms. Those results hold at the 5% threshold. In comparison with the main model restricted to the affected sectors, the effect of the certification is lower by 0.3 unit and less significant as the p-value of the main model equals 0.52%. However, we still notice that the current and the main model shares the same sign regarding the coefficient (2): the beta is positive. Yet, B Corp suffered from a decrease in their liquidity ratio in 2019 (14a) and 2021 (14c), compared to 2018.

Regarding the significant coefficient of the control variables that are higher than 0.001, the model demonstrates that the solvency ratio (3) of the past year affects positively the liquidity ratio of the next

year. Indeed, an additional unit in the solvency ratio improves the liquidity ratio by 0.03 (p-value below 2×10^{-16}).

At the opposite, a 1 point of percentage increase of the return on asset (10) deteriorates the liquidity ratio by 0.0039 unit the next year. This phenomenon is statistically significant under the 0.1% threshold.

A size effect is noticeable too: small (11b), medium (11a), and very large firms (11c) have all a better liquidity ratio on average than large firms. The coefficients oscillate between 0.134 and 0.262, and the p-values between 0.25 and 9.22%.

The age (12) draws a positive influence of around 0.0058 unit on the liquidity ratio per additional year, with a p-value equal to 8.22×10^{-7} %.

Finally, despite being part of the affected sectors, firms have seen a higher liquidity ratio in 2020 (13b) and 2021 (13c) in comparison with 2018. This effect is significant at the 0.1% threshold.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	1.68 e-01	6.79 e-02	2.467	0.013640	*
(2)	BCorp	1.58 e+00	6.33 e-01	2.498	0.012500	*
(3)	SOLV	3.00 e-02	4.62 e-04	64.840	< 2 e-16	***
(4)	INTA	7.62 e-05	2.74 e-05	2.783	0.005389	**
(5)	TFA	-2.64 e-05	3.25 e-06	-8.119	5.04 e-16	***
(6)	CASH	2.33 e-06	1.60 e-06	1.452	0.146402	
(7)	CAP	-1.99 e-06	6.51 e-07	-3.062	0.002202	**
(8)	LOAN	1.25 e-05	3.56 e-06	3.503	0.000461	***
(9)	CASHFLOW	-6.61 e-06	3.11 e-06	-2.128	0.033372	*
(10)	ROA	-3.93 e-03	8.62 e-04	-4.562	5.10 e-06	***
(11a)	Size_factorMedium sized	1.90 e-01	6.28 e-02	3.022	0.002517	**
(11b)	Size_factorSmall	1.34 e-01	6.02 e-02	2.231	0.025675	*
(11c)	Size_factorVery large	2.62 e-01	1.56 e-01	1.684	0.092208	.
(12)	Age	5.82 e-03	1.01 e-03	5.767	8.22 e-09	***
(13a)	Year_factor2019	4.57 e-02	3.75 e-02	1.219	0.222917	
(13b)	Year_factor2020	1.96 e-01	3.71 e-02	5.292	1.22 e-07	***
(13c)	Year_factor2021	1.68 e-01	3.70 e-02	4.537	5.75 e-06	***
(14a)	BCorp:Year_factor2019	-2.68 e+00	8.94 e-01	-2.992	0.002772	**
(14b)	BCorp:Year_factor2020	-8.41 e-01	8.94 e-01	-0.941	0.346815	
(14c)	BCorp:Year_factor2021	-2.38 e+00	8.66 e-01	-2.753	0.005904	**
	R ²	0.2456				
	Adjusted R ²	0.2447				
	F-statistic P-value	< 2.2e-16				
	Observation	16,561				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 9: Summary statistics of the model regressing the liquidity ratio with the affected sectors.

c) Working Capital.

As we stated in the literature review, another means of measuring the liquidity position of a firm is the working capital. The latter should be compared with the working capital need, which at the end gives the net treasury of the firm. However, the database does not provide the working capital needs. Thus, we performed a second robust analysis by regressing the working capital against the BCorp. For the next models, we did not exclude any observations that had a studentized residuals below -3 or above +3. Indeed, the statistical assumptions were verified with the presence of the supposed outliers.

The working capital was retrieved from Orbis under the name WKC and is computed in thousands of euros. The working capital can be computed under two different forms:

$$\left\{ \begin{array}{l} \text{Working Capital} = \text{Restricted current asset} - \text{Short term payable} \\ \text{Working Capital} = \text{Permanent capital} - \text{Fixed asset} \end{array} \right.$$

The model is computed as follows:

$$\begin{aligned} \text{WKC}_{i,t} = & \beta_1 + \beta_2 \text{BCorp}_i + \beta_3 \text{SOLV}_{i,t-1} + \beta_4 \text{INTA}_{i,t-1} + \beta_5 \text{TFA}_{i,t-1} + \beta_6 \text{CASH}_{i,t-1} \\ & + \beta_7 \text{CAP}_{i,t-1} + \beta_8 \text{LOAN}_{i,t-1} + \beta_9 \text{CASHFLOW}_{i,t-1} + \beta_{10} \text{ROA}_{i,t-1} \\ & + \beta_{11} \text{Size_factor}_{i,t} + \beta_{12} \text{Age}_{i,t} + \beta_{13,t} \text{Year_factor}_i + \beta_{14,t} \text{BCorp}_i \times \text{Year_factor}_i \\ & + \varepsilon_i \end{aligned}$$

Where:

- β_1 is the constant of the equation.
- t is the year, $\forall t = \{2018, 2019, 2020, 2021\}$.
- i is the observation, $\forall i = [1; 66,817]; i \in \mathbb{N}$.
- ε is the residuals of the model.

The working capital varies between -327,943 and 995,910 thousands euros. The mean equals 607.1 and the standard deviation 12,018.84. Due to the presence of negative and null data, we are unable to use the logarithm of the working capital as a dependant variable. Results of the linear regression are found in table 10.

The current model is significant, as the p-value of the F-statistic is below 2.2×10^{-16} , while the R-squared indicates that the model measures up to 30% of the variance of the working capital. The R-squared has a higher value than the main model, thus explaining more of the variance of the working capital than the variance of the current ratio.

Alike the main model, we find mixed results concerning the dependant variable B Corp (2) and their cross section with the years (14) on the amount of working capital. The number of B Corp remains the same, as 98 are present in the sample. In other words, we can interpret that receiving the certification does not improve, either on average, or during the COVID-19 crisis, the working capital of companies.

Our analysis will pursue with coefficient that are significant and above one unit, which represent a variation of €1.000 of the working capital.

Correspondingly, the return on asset (10) drives also a positive influence on the working capital, as an increase of one point of percentage of the return on asset improves the working capital by €5.343 the next year. However, the positive effect was not highlighted in the main model, but rather a negative one appeared (-3.319×10^{-3}).

The pattern identified with the size of the firms is also disturbed. Indeed, compared to large size companies, small and medium size companies have a lower amount of working capital

(respectively -1.329e+03 and -1.645e+03) while very large size firms have a working capital 9.191 e+03 higher.

Finally, we notice that the older the company, the higher the working capital. Indeed, the coefficient (12) equals 3.398 e+01.

All effects described in the previous paragraphs have a p-value below 2 e-16, except for the return on asset which is significant at the 5% threshold.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	7.793 e+02	1.855 e+02	4.202 e+03	2.65 e-05	***
(2)	BCorp	8.751 e+02	2.145 e+03	0.408	0.68331	
(3)	SOLV	2.081 e+00	1.279 e+00	1.628 e+03	0.10357	
(4)	INTA	2.686 e-01	4.375 e-03	6.140 e+04	< 2 e-16	***
(5)	TFA	4.200 e-02	1.769 e-03	2.374 e+04	< 2 e-16	***
(6)	CASH	-1.074 e-01	2.301 e-03	-4.669 e+04	< 2 e-16	***
(7)	CAP	-2.230 e-03	8.430 e-04	-2.645 e+03	0.00817	**
(8)	LOAN	2.382 e-01	2.921 e-03	8.153 e+04	< 2 e-16	***
(9)	CASHFLOW	8.071 e-02	2.781 e-03	2.902 e+04	< 2 e-16	***
(10)	ROA	5.343 e+00	2.149 e+00	2.487 e+03	0.01290	*
(11a)	Size_factorMedium sized	-1.645 e+03	1.680 e+02	-9.791 e+03	< 2 e-16	***
(11b)	Size_factorSmall	-1.329 e+03	1.599 e+02	-8.312 e+03	< 2 e-16	***
(11c)	Size_factorVery large	9.191 e+03	3.093 e+02	2.971 e+04	< 2 e-16	***
(12)	Age	3.398 e+01	3.430 e+00	9.908 e+03	< 2 e-16	***
(13a)	Year_factor2019	-1.194 e+01	1.132 e+02	-0.105	0.91599	
(13b)	Year_factor2020	4.541 e-01	1.116 e+02	0.004	0.99675	
(13c)	Year_factor2021	-5.996 e+01	1.107 e+02	-0.542	0.58799	
(14a)	BCorp:Year_factor2019	2.684 e+02	2.969 e+03	0.090	0.92798	
(14b)	BCorp:Year_factor2020	-5.944 e+02	2.941 e+03	-0.202	0.83981	
(14c)	BCorp:Year_factor2021	-3.466 e+02	2.889 e+03	-0.120	0.90450	
	R ²	0.3007				
	Adjusted R ²	0.3006				
	F-statistic P-value	< 2.2 e-16				
	Observation	66,798				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 10: Summary statistic of the model regressing the working capital with the full sample.

d) Working capital of companies from affected sectors.

Like the main model, we find no significant results of our independent variable by regressing the working capital. However, we may support our findings in the affected sectors by performing a model on a sorted sample, which consists of firms that were present in the affected sectors according to the literature.

In the sub sample, the extreme values of the variable WKC are -327,943.0 and 330,452.0 with a median of 27.0. The working capital is computed in thousands of euros and the average firm has 381.2 thousand euros of working capital. The results of the regression appears in table 11.

Overall, the model is significant with the lowest p-value found and explains up to 58.26% of the variance of the working capital.

At the opposite of the model that regressed the current ratio in the affected sectors, we find a negative working capital. Indeed, in comparison with non-B Corp, certified firms have on average a deterioration of the working capital of about €5,335,000. This statement is significant at the 5% threshold. By analysing the evolution of the B Corp's working capital through years, we find no evidence of a persistent evolution. Indeed, p-values are not lower than 23.89%.

We find some similarities on the effects that control variables have on the working capital that appeared with the same sign in the current ratio. For instance, the solvency ratio (3) and the age (12) have a positive coefficient on the measurement of liquidity in the current model and the main model. Similarly, the total fixed asset (5) has a negative coefficient on the measurement of the liquidity.

At the opposite, it turns out that, on the one hand, the coefficients of the amount of intangible asset (4), of the loan and short-term debts (8), and of the comparison between the large and the very large size (11c) have become positive. On the other hand, the coefficients of the amount of cash (6), of the amount of capital (7), of the comparison between large and medium (11a) or small size (11b), have become negative.

Only the cash flow (9), the return on asset (10) or the years (13) have insignificant effect on the working capital.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	9.442 e+02	2.403 e+02	3.929	8.57 e-05	***
(2)	BCorp	-5.353 e+03	2.244 e+03	-2.377	0.0175	*
(3)	SOLV	7.384 e+00	1.622 e+00	4.551	5.38 e-06	***
(4)	INTA	6.060 e+00	9.706 e-02	62.442	< 2e-16	***
(5)	TFA	-3.804 e-01	1.132 e-02	-33.608	< 2e-16	***
(6)	CASH	-6.317 e-01	5.313 e-03	-118.892	< 2e-16	***
(7)	CAP	-9.594 e-03	2.269 e-03	-4.228	2.37 e-05	***
(8)	LOAN	7.609 e-01	9.608 e-03	79.194	< 2e-16	***
(9)	CASHFLOW	1.462 e-02	1.102 e-02	1.327	0.1845	
(10)	ROA	4.776 e+00	3.043 e+00	1.570	0.1165	
(11a)	Size_factorMedium sized	-1.294 e+03	2.20 e+02	-5.380	5.65 e-09	***
(11b)	Size_factorSmall	-1.525 e+03	2.128 e+02	-7.168	7.94 e-13	***
(11c)	Size_factorVery large	1.093 e+04	5.502 e+02	19.868	< 2e-16	***
(12)	Age	3.57 e+01	3.571 e+00	8.559	< 2 e-16	***
(13a)	Year_factor2019	-3.098 e+01	1.327 e+02	-0.233	0.8164	
(13b)	Year_factor2020	-3.880 e+01	1.312 e+02	-0.296	0.7675	
(13c)	Year_factor2021	-1.008 e+02	1.309 e+02	-0.770	0.4415	
(14a)	BCorp:Year_factor2019	-3.331 e+03	3.171 e+03	-1.050	0.2935	
(14b)	BCorp:Year_factor2020	-3.741 e+03	3.172 e+03	-1.179	0.2383	
(14c)	BCorp:Year_factor2021	-3.027 e+03	3.071 e+03	-0.986	0.3242	
	R ²	0.5826				
	Adjusted R ²	0.5821				
	F-statistic P-value	< 2.2e-16				
	Observation	16,640				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 11: Summary statistics of the model regressing the working capital of the affected sectors.

e) Propensity score matching: current ratio

An additional analysis is driven by performing a propensity score matching. The underlying principle is to match non-B Corp firms with B Corp firms on the basis of the control variables (variable 3 to 13), and then perform a multiple linear regression with B Corp and their non-B Corp counterparts. The propensity score matching is mainly used to control the effectiveness of a treatment. In our case, the treatment consists of being certified B Corp.

As the main sample comprises 98 B Corp, the sub sample treated by the propensity score matching comprises only 196 observations. The results of the regression appears in table 12.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	1.548 e+00	7.414 e-01	2088	0.0382	*
(2)	BCorp	-3.710 e-01	7.039 e-01	-0.527	0.5988	
(3)	SOLV	3.700 e-02	6.474 e-03	5714	4.62 e-08	***
(4)	INTA	-3.655 e-05	1.047 e-04	-0.349	0.7273	
(5)	TFA	-2.436 e-04	1.371 e-04	-1777	0.0773	.
(6)	CASH	-3.139 e-06	5.774 e-06	-0.544	0.5873	
(7)	CAP	-1.138 e-05	1.884 e-05	-0.604	0.5468	
(8)	LOAN	9.574 e-06	1.222 e-05	0.783	0.4344	
(9)	CASHFLOW	9.244 e-05	5.545 e-05	1667	0.0973	.
(10)	ROA	-6.136 e-03	8.504 e-03	-0.722	0.4715	
(11a)	Size_factorMedium sized	1.517 e-01	5.058 e-01	0.300	0.7645	
(11b)	Size_factorSmall	-2.841 e-02	5.411 e-01	-0.053	0.9582	
(11c)	Size_factorVery large	1.533 e+00	8.823 e-01	1738	0.0840	.
(12)	Age	-1.125 e-02	1.709 e-02	-0.658	0.5112	
(13a)	Year_factor2019	-1.033 e+00	7.107 e-01	-1453	0.1480	
(13b)	Year_factor2020	-6.689 e-01	6.631 e-01	-1009	0.3145	
(13c)	Year_factor2021	-9.011 e-01	7.347 e-01	-1227	0.2216	
(14a)	BCorp:Year_factor2019	4.325 e-01	9.859 e-01	0.439	0.6614	
(14b)	BCorp:Year_factor2020	6.577 e-01	9.508 e-01	0.692	0.4901	
(14c)	BCorp:Year_factor2021	4.125 e-01	1.007 e+00	0.410	0.6825	
	R ²	0.2511				
	Adjusted R ²	0.1702				
	F-statistic P-value	4.279e-05				
	Observation	196				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 12: Summary statistics of the model with the propensity score matching of the full sample.

The current ratio variates in the sub sample from 0.024 to 19.942, with a median equal to 1,346. The average current ratio equal 2.140 with a standard deviation of 2.5593.

The model explains up to 25.11% of the variance of the current ratio within the sub sample. The p-value of the F-statistic is lower than in the precedent models, as it equals 4.279e-05. Those indicators are not surprising, giving the restricted sample composed of 196 year-based observations.

Regarding the independent variable (2), B Corp has a negative – but insignificant – coefficient. In other words, it seems that certified firms have a 0.371 lower current ratio than non-certified firms that share the same attributes. Still, there is a nearly 60% chance that the coefficient equals zero, meaning that the results could not be interpreted to the whole population. The coefficient (14) demonstrates that the current ratio of the average B Corp increased in comparison with 2018, while the whole sample

faced a lower current ratio in comparison with 2018. Still, all coefficient related to time (13 and 14), both for certified firms and the whole sub sample, are insignificant.

Finally, only the solvency ratio of the past year seems to be a determinant for the current ratio of the next year, as its p-value is significant at the 0.1% threshold. A 1 point of increase of the solvency ratio leads, on average, to a 0.037-unit improvement of the current ratio the next year.

f) Propensity score matching: current ratio of the affected sectors

We perform also a second regression on the affected sectors, as we executed it for all previous models. The sub sample consisted of 29 B Corp, and 29 non-B Corp. The mean of the current ratio equals 2.144 with a standard deviation of 3.925. The current ratio oscillates between 0.001 and 97.399, with a median of 1.312. The regression performed has its results summarized in table 13.

		Coefficient	Standard error	t-value	Pr (> t)
(1)	Intercept	3.749 e+00	2.479 e+00	1.512	0.1388
(2)	BCorp	1.765 e+00	1.425 e+00	1.239	0.2230
(3)	SOLV	3.524 e-02	1.572 e-02	2.242	0.0309 *
(4)	INTA	-1.196 e-04	2.922 e-04	-0.409	0.6846
(5)	TFA	-9.397 e-04	8.488 e-04	-1.107	0.2752
(6)	CASH	-1.457 e-04	1.056e-04	-1.380	0.1757
(7)	CAP	2.740 e-04	1.971 e-04	1.390	0.1725
(8)	LOAN	1.543 e-04	3.911 e-04	0.394	0.6955
(9)	CASHFLOW	2.218 e-04	1.721 e-04	1.289	0.2051
(10)	ROA	-6.072 e-03	2.233 e-02	-0.272	0.7872
(11a)	Size_factorMedium sized	-2.944 e+00	2.244 e+00	-1.312	0.1973
(11b)	Size_factorSmall	-3.555 e+00	2.552 e+00	-1.393	0.1717
(11c)	Size_factorVery large	-3.721 e+00	3.058 e+00	-1.217	0.2312
(12)	Age	8.265 e-03	5.350 e-02	0.154	0.8780
(13a)	Year_factor2019	1.659 e-01	2.140 e+00	0.078	0.9386
(13b)	Year_factor2020	3.925 e+00	1.785 e+00	2.198	0.0341 *
(13c)	Year_factor2021	2.324 e+00	1.746 e+00	1.331	0.1911
(14a)	BCorp:Year_factor2019	-2.839 e+00	2.583 e+00	-1.099	0.2787
(14b)	BCorp:Year_factor2020	-4.760 e+00	2.434 e+00	-1.956	0.0579 .
(14c)	BCorp:Year_factor2021	-4.454 e+00	2.347 e+00	-1.898	0.0653 .
	R ²	0.4908			
	Adjusted R ²	0.2362			
	F-statistic P-value	0.0419			
	Observation	58			

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 13: Summary statistics of the model with the propensity score matching of affected sectors.

The model is significant at the 5% threshold, as the p-value of the F-statistic equals 0.0419. Those results are not surprising, giving the small number of observations present in the sub sample. Still, the variance of the current ratio is explained by nearly 50% (49.08%), which represent the highest level of explanation in all our previous models.

Regarding the coefficient, none of them satisfies the 1% threshold, which is explainable again by the size of the sub sample. The independent variable is insignificant but presents improvement of the current ratio in the treatment (i.e., certified firms) group. In comparison with the year 2018, B Corp

seems to have a lower current ratio in 2020 and 2021 (14b and 14c). Those results are consistent with the precedent findings, especially for the year 2021, and are significant under the 10% threshold.

Finally, we notice the positive and significant effect (5% threshold) of an improvement of the solvency ratio on the current ratio of the next year. In the sub sample, an increase of 1 unit in the solvency ratio improves the current ratio by 0.035 unit. In addition, the sub sample is characterized by a growth of the current ratio in 2020, compared to 2018. This result appears significant, at the opposite of the related model without the propensity score matching, at the 5% threshold.

g) Logistic regression

We perform other model, such as a logistic regression to determine if the B Corp had an influence on the current ratio. The logistic regression works on the basis of a binary variable. Thus, we created a new binary variable that takes 1 if the current ratio is between 1.2 and 2, and zero otherwise. The aim of creating the binary variable is to discriminate the observation between optimum current ratios and non-optimum current ratios. The determination of a range related to an optimum current ratio has been performed according to Torsin (2021).

The logistic regression is computed as follows:

$$\log\left(\frac{p}{1-p}\right) = \beta_1 + \beta_2 \text{BCorp}_i + \beta_3 \text{SOLV}_{i,t-1} + \beta_4 \text{INTA}_{i,t-1} + \beta_5 \text{TFA}_{i,t-1} + \beta_6 \text{CASH}_{i,t-1} \\ + \beta_7 \text{CAP}_{i,t-1} + \beta_8 \text{LOAN}_{i,t-1} + \beta_9 \text{CASHFLOW}_{i,t-1} + \beta_{10} \text{ROA}_{i,t-1} \\ + \beta_{11} \text{Size_factor}_{i,t} + \beta_{12} \text{Age}_{i,t} + \beta_{13,t} \text{Year_factor}_i + \beta_{14,t} \text{BCorp}_i \times \text{Year_factor}_i \\ + \varepsilon_i$$

Where:

- β_1 is the constant of the equation.
- P is the likelihood that a firm became B Corp ($\text{BCorp}_i = 1$).
- t is the year, $\forall t = \{2018, 2019, 2020, 2021\}$.
- i is the observation, $\forall i = [1; 66,817]; i \in \mathbb{N}$.
- ε is the residuals of the model.

Thus, the current model has the aim to detect if being a B Corp improves the probability of a firm to have an optimum current ratio. A first regression is performed on the full database and showed no results regarding the variable BCorp (2) and their cross section with the years (14). We then filtered our database on the affected sectors and no results are found again. The results of both models are reported in the appendices. However, we performed a propensity score matching on the basis of the current ratio and the model found significant results when regressed the new binary variable. The results of the logistic regression are shown in table 14. To ensure consistency, we also performs a logistic regression with the affected sectors once a propensity score matching was applied. Despite the absence of results, the summary statistics are shown in the Appendices.

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	-2.165 e+00	8.471 e-01	-2.556	0.0106	*
(2)	BCorp	1.548 e+00	7.812 e-01	1.982	0.0475	*
(3)	SOLV	4.836 e-03	6.556 e-03	0.738	0.4607	
(4)	INTA	-3.979 e-04	2.411 e-04	-1.650	0.0990	.
(5)	TFA	-2.204 e-05	1.697 e-04	-0.130	0.8967	
(6)	CASH	-1.959 e-05	1.837 e-05	-1.067	0.2861	
(7)	CAP	-4.177 e-05	2.623 e-05	-1.592	0.1113	
(8)	LOAN	3.139 e-05	1.458 e-05	2.152	0.0314	*
(9)	CASHFLOW	-9.359 e-05	9.051 e-05	-1.034	0.3011	
(10)	ROA	-2.685 e-03	8.738 e-03	-0.307	0.7586	
(11a)	Size_factorMedium sized	-5.286 e-01	5.367 e-01	-0.985	0.3247	
(11b)	Size_factorSmall	-6.854 e-02	5.644 e-01	-0.121	0.9033	
(11c)	Size_factorVery large	1.043 e+00	8.890 e-01	1.173	0.2408	
(12)	Age	3.296 e-02	1.878 e-02	1.755	0.0792	.
(13a)	Year_factor2019	1.236 e+00	7.764 e-01	1.592	0.1113	
(13b)	Year_factor2020	9.321 e-01	7.401 e-01	1.259	0.2079	
(13c)	Year_factor2021	1.807 e-01	9.357 e-01	0.193	0.8469	
(14a)	BCorp:Year_factor2019	-8.654 e-01	9.945 e-01	-0.870	0.3842	
(14b)	BCorp:Year_factor2020	-6.168 e-01	9.770 e-01	-0.631	0.5278	
(14c)	BCorp:Year_factor2021	1.459 e-02	1.134 e+00	0.013	0.9897	
	AUC	0.7281				
	Observation	196				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 14: Summary statistics of logistic regression with the full sample.

We measured the level of performance of our model by computing the area under the ROC¹¹ curve (AUC). The AUC of a model is between 0.5 and 1, 1 being a perfect level of discrimination. Indeed, the AUC measures the level of classification of the model. In our last model, the AUC equals 0.7281, which is considered as positive: the model has relatively good ability to distinguish between classes, that is to say, distinguish between an optimum current ratio and a non-optimum one. We noticed that in the two previous logistic regression, the AUC was close to 0.5, meaning that the models have a bad performance in distinguishing the categories.

To facilitate the interpretation of the results, we computed in table 15 the exponential of each coefficient. Indeed, the results of a logistic regression should be elevated at their exponential to determine the increase of likelihood when the variable increase by one unit.

¹¹ Receiver Operating Characteristic is a graph displaying the rate of fake positive in function of the rate of fake negative for different thresholds.

		Coefficient	Pr (> t)	
(1)	Intercept	0.1147	0.0106	*
(2)	BCorp	4.7021	0.0475	*
(3)	SOLV	1.0048	0.4607	
(4)	INTA	0.9996	0.0990	.
(5)	TFA	1.0000	0.8967	
(6)	CASH	1.0000	0.2861	
(7)	CAP	1.0000	0.1113	
(8)	LOAN	1.0000	0.0314	*
(9)	CASHFLOW	0.9999	0.3011	
(10)	ROA	0.9973	0.7586	
(11a)	Size_factorMedium sized	0.5894	0.3247	
(11b)	Size_factorSmall	0.9338	0.9033	
(11c)	Size_factorVery large	2.8377	0.2408	
(12)	Age	1.0335	0.0792	.
(13a)	Year_factor2019	3.4418	0.1113	
(13b)	Year_factor2020	2.5398	0.2079	
(13c)	Year_factor2021	1.1981	0.8469	
(14a)	BCorp:Year_factor2019	0.4209	0.3842	
(14b)	BCorp:Year_factor2020	0.5397	0.5278	
(14c)	BCorp:Year_factor2021	1.0147	0.9897	

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

Table 15: exponential of coefficient of the table 14.

Therefore, our model states that a certified B Corp has a 4.7021 times more chance to enter into an optimum current ratio than a non B Corp firms. This result is significant at the 5% threshold. However, we find no significant changes in the likelihood of B Corp through the years, meaning that our hypothesis is not fully validated by this model.

Regarding other variables, the amount of loan of the last year increases by 1 the likelihood to make the current ratio an optimum. This effect is significant at the 5% threshold. In other words, an increase by one thousand euro of loans increase the chance of the company to have a current ratio between 1.2 and 2 the next year.

h) Conclusion on the robustness tests

At first, we performed a regression of the liquidity ratio, with the whole sample and with a restricted sample. The restricted sample consisted of companies that are present in negatively affected sectors, identified by the scientific literature (see Appendices). The results found in the main model hold: B Corp do not have a better liquidity position on average. However, restricting the sample to the affected sectors revealed a statistically significant enhancement of the liquidity ratio, as of the current ratio. A negative evolution of B Corp liquidity ratio is observable during the year 2019 and 2021, compared to 2018. This may indicate that, in affected sectors, B Corps were not following the same trends as their non-B Corp counterparts. We may interpret that the decreasing current ratio led to an increase of current liabilities or a decrease of current assets.

Secondly, we performed the same analysis with the working capital. In that case, we found mixed evidence that being certified is linked with an improvement of the working capital. Nevertheless, B Corps present in affected sectors undergo a deteriorated working capital on average.

Thirdly, as the amount of non-B Corp observations could potentially overwhelm the results of B Corps, we applied to our sample a propensity score matching. Results are consistent with the previous

findings with regards to the cross section of the certified firms and the years. However, results regarding the average B Corp disappeared, both in the full sample and in the sample composed of only the affected sectors.

Finally, we performed a logistic regression with an applied propensity score matching to the sample. The results revealed a positive influence of the certification in the chances to report an optimum current ratio. Nevertheless, there is no statistically significant chance that a B Corp entered into an optimum current ratio at the outbreak of the COVID.

6. Discussion

Based on the previous sections, we can eventually draw the conclusions of our study.

Firstly, we performed a linear regression of the current ratio against the variable B Corp and the control variables. The model, despite being significant, showed an absence of proof that B Corp were more robust overall, and during the pandemic. The same results appeared when we regressed the liquidity ratio. Such findings are reminding us of the absence of evidence that sustainable firms are outperforming the market (Bae et al, 2021), in terms of financial performance. However, if any effect is present, it may be mitigated due to the overinvestment in CSR as Yi et al. (2021) found out. In that case, we could suppose that sustainable firms (especially B Corp) may have a better liquidity position, but due to the required investment to remain 'sustainable', those firms deteriorated their position. Yet, it is impossible to determine if our sample was a result of the mitigation of a positive effect.

Secondly, we chose to regress the sample based on some filters. The first filter, which consisted of selecting only sectors that were negatively impacted by the COVID, revealed that the practice of being B Corp improved the current ratio. We may draw the parallel with the paper of Wasiuzzaman et al. (2021). Indeed, the author pointed out a link between high CSR performance and improved liquidity. However, as we noticed in the literature review section, Wasiuzzaman et al. (2021) interpreted that firms benefiting from a better liquidity position had better CSR performance. In other words, the liquidity draws an effect *on* the CSR performance, not the opposite. If we project the same interpretation on our study, it will mean that more liquid firms in impacted sectors tended to adopt a hybrid model. Perhaps, our study provides an additional approach to the findings of Reddy Yarram et al. (2021). Indeed, the author analysed the debt structure of Australian listed companies and compared it to the level of corporate social performance (CSP). The results indicated that listed firms that included stakeholders into their policy tend to reduce their short-term debts. In that case, the current ratio increases, which is supporting our findings.

Still, the certified companies faced a current ratio lower than 2018 for the three next years. The same results appeared when we regressed the liquidity ratio. Regarding other treatment of the sample, no significant evidences were found in neutrally impacted sectors, liquid and illiquid firms. Thus, we may interpret that the fact of being a B Corp matters in sectors in difficulties. In that case, a company facing liquidity issues would not benefit solely from its engagement in a hybrid model in a future similar crisis.

When performing a regression of the working capital, which is a component of the Net Treasury, we noticed, in affected sectors, the presence of an inferior working capital among the B Corp. The results when regressing the whole sample enter in line with Gartchie Gatsi et al. (2016) who found insignificant coefficient between CSR disclosures and working capital.

Finally, we applied a propensity score matching on the whole sample and on a sub sample restricted to negatively affected sectors. We found no difference between non-B Corp and B Corp based on their current ratio. The only evidence found in the multiple linear regression was the negative growth of the current ratio among the certified firms, compared to 2018. At the opposite, the logistic regression revealed an increase of the odds in positioning a certified company into an optimum current ratio, that is to say, a current ratio between 1.2 and 2.

In light with all the above results, we may conclude that our study suffered from the same difficulties as the scientific literature related to this topic. Indeed, while we explored the literature, we found mixed evidence and no clear-cut answer regarding the question: could a firm benefit from its adoption of CSR in its strategy? Therefore, we conclude that our hypothesis "H1: B Corp certified firms had on average a better liquidity position during the COVID-19 era than non-certified B Corp" is not validated.

A. Limitation

Our study is restricted by some limitations. First, as faced in the literature, there was a lack of data regarding B Corp: on one hand, only 52 firms are certified in Belgium, while on the other hand, a few had comprehensive data. This issue was anticipated at first, by selecting firms in the Netherlands, Luxembourg and Belgium. Initially, a total of 255 B Corp could be found in our research. However, the database did not provide sufficient data regarding B Corp and non-B Corp in Luxembourg and the Netherlands, and led to the observation of zero B Corp in those countries.

In addition, effects of being a B Corp in practice may have been mitigated by information asymmetry: stakeholders may miss, be unaware, or even misinterpret the label B Corp. In those cases, adopting the hybrid model does not mitigate the reputational risk, attract additional investors (see Höck et al., 2022), or decrease the time of payment (see Uyar et al., 2022) which in turn, neutralize an impact on the liquidity position. It may be interesting to compare results with the population's degree of awareness, and regress liquidity against this level of awareness to seize any particular effect.

Secondly, our study was limited in time. Too much data was lacking for the year 2022, which obliged us to restrict our study from 2018 to 2021. Yet, some restrictions were still elaborated in Belgium until March 22nd 2022. It would have been interesting to include a post-COVID period to our model to determine a potential lasting effect in our study, especially the negative growth encountered for B Corp.

Thirdly, some control variables highlighted in the literature review could not be measured and regressed in our model. For instance, the degree of innovation of which companies engaging in CSR is unmeasurable. We found no statistical data regarding governments help, in terms of direct fiscal support, direct or indirect lending. Furthermore, we found no data regarding transfer of liquidity among branch and parent companies. This may have a negative effect on the difference between non-B Corp and B Corp. Level of competition or constraint was also impossible to measure in accordance with our database.

B. Future Research

As highlighted in the previous section, the logical continuation of our research should be to continue the regression with the following years. Indeed, the number of certifications does not stop to rise (Paelman et al., 2022), which increases the data regarding B Corp and the public awareness. In that case, results could be more significant, allowing interpretation of our coefficients. Furthermore, the inclusion of the omitted variables cited above could improve the overall explanation of the variance of the liquidity ratios. Indeed, we do not know if the improvement of liquidity was performed thanks to the public awareness, innovation, actions taken by governments, branches in foreign countries or specificity of sectors.

In addition, the study could be continued in other countries. The WHO published a document in 2020 stating that: “Although the COVID-19 virus infects those exposed indiscriminately, exposure risk and the severity of its health, social and economic impacts are not being felt equally”. Thus, studies in other part of the world could determine if being part of the movement B Corp brought additional defences against a liquidity shortage, as differences emerged among countries.

As Paelman et al. (2022) performed, it would be interesting to study in depth the comprehensive financial structure of B Corps, with qualitative inquiries and comparison of the balance sheets. Indeed, our study is limited to 33 Belgian B Corp present in the database Orbis. We did not look for the financial statements on the national bank of Belgium website, nor contacted management bodies of missing B Corp for further data. Those may be hints for future studies.

During the design of the empirical study, and put in light with one of the lecture given by Mr Torsin (2023), a question emerged on the effectiveness of the financial statements today. Stakeholders does not limit themselves to a balance sheet, profits or notes analysis, but looks for other information. Furthermore, the development of non-financial audit assignment, such as ESG statements, highlight a missing part in those financial statements. We made our best to compile excellent sustainable firms and their financial figures, but this information is more and more researched by stakeholders. Thus, shouldn't the governing bodies oblige firms to disclose ESG on a standardized manners in a hypothetical fourth sections of the financial statements? And in that case, what could be the criteria to implement in this fourth section?

7. Conclusion

This paper explored the mitigation effect on the liquidity position that a B Corp could benefit from its certification, during the COVID-19 crisis. Indeed, after the declaration of the WHO that the COVID-19 was a pandemic, numerous governments took the decision to implement a lockdown for its population. As a consequence, many non-necessary businesses had to close, preventing them from making any sales. The scientific literature predicted in 2020 an increasing number of bankruptcy due to cash shortages (McGeever et al., 2020; Demmou et al., 2021), due to the lockdowns.

We reviewed the literature on four main concepts: liquidity, COVID-19, CSR and B Corp. We found no paper that combined the three former concepts, rather a combination of two at most. The literature highlighted the negative effect of the pandemic on the liquidity, and many solutions were adopted by firms to mitigate such a negative effect. For instance, Almeida (2020) pointed out the different means to foster firm's liquidity, especially with credit lines. In addition, government indebted themselves to save as much firm as possible. In fact, about 30% of the firms would have gone bankrupt if governments did not act (Demmou et al., 2021). Nevertheless, our review also pointed out the difficulties to trust ESG ratings as many disparities among the ratings exist (Berg et al., 2019). Thus, we decided to choose a rating that was able to prioritize substance over form, and we found the label B Corp that certified the excellence of the CSR practice.

Our research consisted of studying the effect of being a B Corp during the pandemic on the liquidity ratio of companies. Our research was delimited to the period between 2018 and 2021 and to some specific sectors, which maximised the number of B Corp. We performed many multiple linear regressions and one logistic regression. We found mixed evidence that certified firms had a better report between their current assets and their current liabilities during the crisis, than non-certified firms. Yet, in affected sectors, we found mixed results that being a B Corp improved the liquidity ratios. The significant findings are related to the fact that firms certified B Corp, which are located in affected sectors, disclosed a worsen liquidity ratio in the three next years compared with 2018.

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9. Executive summary

On March 11th, 2020, the World Health Organization has sounded the alarm bell by classifying the COVID-19 as a pandemic. In consequence, many countries established a lockdown, cutting off sales for many companies and triggering a liquidity shortage for firms. Companies tried to solve the shortages by extending their lines of credits, taking out new short and long-term loans, adjusting operations, and so on. But liquidity is influenced by external factors, such as the condition of the customer (McCann et al., 2020), the access to the banking sector (Paelman et al., 2022) or macro-economic factors (Chen et al., 2008) for instance. Thus, we ask ourselves if the adoption of a CSR strategy could modify positively the liquidity position of a company, especially during the COVID crisis. However, we found in the literature a lack of consistency on *how* to measure a CSR strategy, and we decided to choose the label B Corp, which points the level of excellence in the sustainable practices.

We performed multiple linear regressions with 66,817 year related observations, out of which 98 are certified B Corp. We found mixed results that firms, which are certified in their sustainable practice by the label, benefited from additional protections in their liquidity position, during the pandemic. However, we found significant results related to B Corp located in sectors impacted by the COVID. Indeed, those certified companies had on average a lower liquidity position between 2019 and 2021, in comparison with the year 2018.

Keywords: COVID-19, pandemic, Liquidity, Current Ratio, CSR, label B Corp.

Word count: 29.620 words

10. Appendices

a) List of sectors held for the research.

NACE code	Name	Type of impact
1039	Other processing and preserving of fruit and vegetables	Neutral
1082	Manufacture of cocoa, chocolate and sugar confectionery	Neutral
1101	Distilling, rectifying and blending of spirits	Neutral
1107	Manufacture of soft drink; production of mineral waters and other bottled waters	Neutral
2651	Manufacture of instruments and appliances for measuring, testing and navigation	Neutral
3320	Installation of industrial machinery and equipment	/
4638	Wholesale of other food, including fish, crustaceans and molluscs	Negative
4649	Wholesale of other household goods	Negative
4711	Retail sale in non-specialised stores with food, beverages or tobacco predominating	Negative
4729	Other retail sale of food in specialised stores	Negative
5110	Passenger air transport	Negative
5829	Other software publishing	Neutral
5911	Motion picture, video and television programme production activities	Neutral
6201	Computer programming activities	Neutral
6420	Activities of holding companies	/
6619	Other activities auxiliary to financial services, except insurance and pension funding	/
6910	Legal activities	/
7021	Public relations and communication activities	Neutral
7022	Business and other management consultancy activities	/
8211	Combined office administrative service activities	/

The determination of those sectors was performed in order to maximize the number of B Corp. The type of impact is either negative, neutral, positive or absent (/). Negative impact means that firms were affected by the COVID according to the literature. Positive impact means that the COVID represented an opportunity of growth for those sectors. Eventually, neutral impact means that the sector was not (hardly) impacted according to the literature. Finally, absent impact means that the literature has not analysed those sectors with regards to the pandemic. The articles consulted in the determination of the impact are the followings: Auziņa-Emsiņa et al., 2021; Demmou et al., 2021; De Vet et al., 2021; Guerini et al., 2020; McCann et al., 2020; McGeever et al., 2020; Shevchenko, 2020.

b) Logistic Regression with the full sample

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	-1.11 e+00	4.29 e-02	-25.794	< 2e-16	***
(2)	BCorp	5.22 e-01	4.48 e-01	1.166	0.244	
(3)	SOLV	-3.76 e-03	2.94 e-04	-12.788	< 2e-16	***
(4)	INTA	2.65 e-07	9.82 e-07	0.270	0.787	
(5)	TFA	5.75 e-07	3.79 e-07	1.517	0.129	
(6)	CASH	-6.02 e-06	1.10 e-06	-5.468	4.54e-08	***
(7)	CAP	-2.46 e-07	2.51 e-07	-0.979	0.327	
(8)	LOAN	4.29 e-07	7.16 e-07	0.599	0.549	
(9)	CASHFLOW	5.85 e-07	6.76 e-07	0.866	0.387	
(10)	ROA	8.17 e-03	4.92 e-04	16.603	< 2e-16	***
(11a)	Size_factorMedium sized	-6.32 e-03	3.91 e-02	-0.162	0.872	
(11b)	Size_factorSmall	5.39 e-02	3.72 e-02	1.447	0.148	
(11c)	Size_factorVery large	5.68 e-01	6.82 e-02	8.329	< 2e-16	***
(12)	Age	5.45 e-03	7.71 e-04	7.067	1.58e-12	***
(13a)	Year_factor2019	-7.46 e-04	2.58 e-02	-0.029	0.977	
(13b)	Year_factor2020	-1.25 e-02	2.55 e-02	-0.490	0.624	
(13c)	Year_factor2021	-3.68 e-02	2.53 e-02	-1.454	0.146	
(14a)	BCorp:Year_factor2019	2.30 e-01	6.12 e-01	0.376	0.707	
(14b)	BCorp:Year_factor2020	1.27 e-01	6.08 e-01	0.209	0.834	
(14c)	BCorp:Year_factor2021	2.86 e-01	5.98 e-01	0.478	0.633	
	AUC	0.5592				
	Observation	66,798				

***, **, *, and . respectively represent the significance levels of 0.1%, 1%, 5% and 10%.

		Exp (Coefficient)
(1)	Intercept	0.3305
(2)	BCorp	1.6854
(3)	SOLV	0.9962
(4)	INTA	1.0000
(5)	TFA	1.0000
(6)	CASH	1.0000
(7)	CAP	1.0000
(8)	LOAN	1.0000
(9)	CASHFLOW	1.0000
(10)	ROA	1.0082
(11a)	Size_factorMedium sized	0.9937
(11b)	Size_factorSmall	1.0553
(11c)	Size_factorVery large	1.7654
(12)	Age	1.0055
(13a)	Year_factor2019	0.9993
(13b)	Year_factor2020	0.9876
(13c)	Year_factor2021	0.9639
(14a)	BCorp:Year_factor2019	1.2586
(14b)	BCorp:Year_factor2020	1.1355
(14c)	BCorp:Year_factor2021	1.3308

c) Logistic Regression with the affected sectors

		Coefficient	Standard error	t-value	Pr (> t)	
(1)	Intercept	-9.52 e-01	9.08 e-02	-10.489	< 2e-16	***
(2)	BCorp	-8.84 e-01	1.09 e+00	-0.815	0.4152	
(3)	SOLV	2.60 e-03	6.14 e-04	4.231	2.33e-05	***
(4)	INTA	-8.90 e-05	4.90 e-05	-1.818	0.0690	.
(5)	TFA	-3.69 e-05	8.26 e-06	-4.467	7.94e-06	***
(6)	CASH	8.03 e-06	3.14 e-06	2.558	0.0105	*
(7)	CAP	-9.63 e-07	9.06 e-07	-1.063	0.2879	
(8)	LOAN	1.74 e-06	3.55 e-06	0.489	0.6249	
(9)	CASHFLOW	5.33 e-06	5.95 e-06	0.896	0.3703	
(10)	ROA	1.22 e-02	1.17 e-03	10.430	< 2e-16	***
(11a)	Size_factorMedium sized	3.45 e-02	8.29 e-02	0.416	0.6771	
(11b)	Size_factorSmall	-7.51 e-02	8.02 e-02	-0.936	0.3492	
(11c)	Size_factorVery large	8.79 e-01	2.03e-01	4.329	1.50e-05	***
(12)	Age	-2.43 e-03	1.34 e-03	-1.814	0.0696	.
(13a)	Year_factor2019	2.80 e-02	4.98 e-02	0.563	0.5737	
(13b)	Year_factor2020	1.13 e-01	4.88 e-02	2.319	0.0204	*
(13c)	Year_factor2021	-5.86 e-03	4.90 e-02	-0.119	0.9049	
(14a)	BCorp:Year_factor2019	2.81 e+00	1.39 e+00	2.027	0.0427	*
(14b)	BCorp:Year_factor2020	1.27 e+00	1.34 e+00	0.944	0.3450	
(14c)	BCorp:Year_factor2021	1.54 e+00	1.32 e+00	1.164	0.2445	
	AUC	0.5763				
	Observation	16,640				

***, **, *, and . respectively represent the significance levels of 0.1%. 1%. 5% and 10%.

		Exp (Coefficient)
(1)	Intercept	0.3859
(2)	BCorp	0.4132
(3)	SOLV	1.0026
(4)	INTA	0.9999
(5)	TFA	1.0000
(6)	CASH	1.0000
(7)	CAP	1.0000
(8)	LOAN	1.0000
(9)	CASHFLOW	1.0000
(10)	ROA	1.0122
(11a)	Size_factorMedium sized	1.0351
(11b)	Size_factorSmall	0.9277
(11c)	Size_factorVery large	2.4087
(12)	Age	0.9976
(13a)	Year_factor2019	1.0284
(13b)	Year_factor2020	1.1199
(13c)	Year_factor2021	0.9942
(14a)	BCorp:Year_factor2019	16.6598
(14b)	BCorp:Year_factor2020	3.5609
(14c)	BCorp:Year_factor2021	4.6413

d) Logistic Regression with the propensity score matching of the affected sectors

		Coefficient	Standard error	t-value	Pr (> t)
(1)	Intercept	2.380	3.775	0.630	0.528
(2)	BCorp	-0.973	1.646	-0.591	0.554
(3)	SOLV	-0.017	0.023	-0.769	0.442
(4)	INTA	-0.001	0.001	-0.726	0.468
(5)	TFA	-0.001	0.001	-1.147	0.251
(6)	CASH	0.000	0.000	-0.433	0.665
(7)	CAP	-0.001	0.001	-0.855	0.393
(8)	LOAN	0.001	0.001	0.793	0.428
(9)	CASHFLOW	0.000	0.000	-0.549	0.583
(10)	ROA	0.005	0.036	0.139	0.890
(11a)	Size_factorMedium sized	-1.770	3.505	-0.505	0.614
(11b)	Size_factorSmall	-3.410	3.778	-0.903	0.367
(11c)	Size_factorVery large	-6.516	8.991	-0.725	0.469
(12)	Age	-0.049	0.054	-0.918	0.358
(13a)	Year_factor2019	1.641	2.077	0.790	0.430
(13b)	Year_factor2020	-17.700	2414.000	-0.007	0.994
(13c)	Year_factor2021	2.429	2.205	1.102	0.271
(14a)	BCorp:Year_factor2019	2.929	2.711	1.081	0.280
(14b)	BCorp:Year_factor2020	20.810	2414.000	0.009	0.993
(14c)	BCorp:Year_factor2021	-0.130	2.612	-0.050	0.960
	AUC	0.9167			
	Observation	58			

***, **, *, and . respectively represent the significance levels of 0.1%. 1%. 5% and 10%.

		Exp (Coefficient)
(1)	Intercept	10.804
(2)	BCorp	0.377
(3)	SOLV	0.982
(4)	INTA	0.999
(5)	TFA	0.998
(6)	CASH	0.999
(7)	CAP	0.999
(8)	LOAN	1.001
(9)	CASHFLOW	0.999
(10)	ROA	1.004
(11a)	Size_factorMedium sized	0.170
(11b)	Size_factorSmall	0.033
(11c)	Size_factorVery large	0.001
(12)	Age	0.951
(13a)	Year_factor2019	5.160
(13b)	Year_factor2020	0.000
(13c)	Year_factor2021	11.347
(14a)	BCorp:Year_factor2019	18.708
(14b)	BCorp:Year_factor2020	1,090,606,717
(14c)	BCorp:Year_factor2021	0.878

e) Summary of models

As we performed many models with different results. we propose to summarize the key findings in the following table. The table will report only the situation of the independent variables (2) and (14).

Name	Findings
Main model	Insignificant results.
Neutral impacted sectors	Insignificant results.
Negatively impacted sectors	Certification improves the current ratio on average by 1.89 unit. Yet. B Corp experienced negative growth in 2019 and 2021, in comparison with 2018.
Illiquid firms	Insignificant results.
Liquid firms	Insignificant results.
Liquidity ratio	Insignificant results.
Liquidity ratio of firms from impacted sectors	Certification improves the liquidity ratio by 1.58 unit. Again, B Corp experienced negative growth of their liquidity position in 2019 and 2021, in comparison with 2018
Working Capital	Insignificant results.
Working capital of companies from affected sectors.	B Corp on average have a 0.0053 lower working capital than their non-B Corp counterparts.
Propensity score matching: current ratio	Insignificant results.
Propensity score matching: current ratio of the affected sectors	Negative growth of B Corp in 2020 and 2021 compared to 2018 in their current ratio.
Logistic regression with propensity score matching	The certification increases the likelihood by 4.7021 times to enter into an optimum current ratio

the 1990s, the number of people in the UK who are employed in the public sector has increased from 10.5 million to 12.5 million (12% of the population) (Department of Health 2000).

There are a number of reasons for this increase. One of the main reasons is the increasing demand for health care services. The population is ageing, and there is a growing number of people with chronic conditions such as diabetes, heart disease, and asthma. This has led to a corresponding increase in the number of people who are employed in the public sector, particularly in the areas of health care and social care.

Another reason for the increase is the expansion of the public sector. The government has invested heavily in the public sector, particularly in the areas of health care and social care. This has led to a corresponding increase in the number of people who are employed in the public sector, particularly in the areas of health care and social care.

There are a number of challenges facing the public sector in the 21st century. One of the main challenges is the increasing demand for health care services. The population is ageing, and there is a growing number of people with chronic conditions such as diabetes, heart disease, and asthma. This has led to a corresponding increase in the number of people who are employed in the public sector, particularly in the areas of health care and social care.

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