Economics Bulletin

Volume 45, Issue 2

Liquidity, responsiveness, and external shocks: A firm-level approach

Paul Vera-Gilces
Observatorio Estadístico de Banano

José Gabriel Castillo García
Escuela Superior Politécnica del Litoral (ESPOL)

Segundo Camino-Mogro
Universidad de Especialidades Espíritu Santo

Jack Zambrano
ESPAE Graduate School of Management, Escuela Superior Politécnica del Litoral (ESPOL)

Xavier Ordeñana
ESPAE Graduate School of Management, Escuela Superior Politécnica del Litoral (ESPOL)

Juan Dominguez
ESPAE Graduate School of Management, Escuela Superior Politécnica del Litoral (ESPOL)

Abstract

This document presents an analytical tool that allows monitoring the liquidity conditions of firms in Ecuador. In this way, we analyze the situation of the firms using liquidity ratios and constructing the operating cash flow of the firms. Our results show that at least half of the firms in Ecuador have liquidity problems because of the COVID-19 pandemic and that their working capital has a slow adjustment level when facing adverse situations.

Citation: Paul Vera-Gilces and Jack Zambrano and José Gabriel Castillo García and Xavier Ordeñana and Segundo Camino-Mogro and Juan Dominguez, (2025) "Liquidity, responsiveness, and external shocks: A firm-level approach", *Economics Bulletin*, Volume 45, Issue 2, pages 809-822
Contact: Paul Vera-Gilces - pauavera@espol.edu.ec, Jack Zambrano - jacbrzam@espol.edu.ec, José Gabriel Castillo García - jcastil@espol.edu.ec, Xavier Ordeñana - xordenan@espol.edu.ec, Segundo Camino-Mogro - scaminom@uees.edu.ec, Juan Dominguez - jdomingu@espol.edu.ec.
Submitted: August 28, 2024. **Published:** June 30, 2025.

Liquidity, responsiveness, and external shocks: a firm-level approach

1. Introduction

The pandemic caused by COVID-19 developed great economic challenges around the world. The logistics and operations crisis produced difficulties in the external and internal sectors, mainly because of the deterioration of the labor market and household consumption, the stagnation of production, and the slowdown of the supply chain flow. The OECD (2020a) forecast mentioned that the loss of employment could contract demand to the point of causing a possible global economic recession. In the case of Ecuador, the recession already began (BPE 10th Edition, 2020).

At the business level, a sustained contraction in demand implies operational changes that range from expense and investment cutbacks and changes in the management of working capital to a possible closure of business operations. The planning processes – based on historical information – of inventories, purchases, and payments, are no longer valid in this scenario. The reserves/liquidity level is one of the few tools for firms to face this type of shock.

Previous studies such as the one carried out by Camino-Mogro et al (2020), show that firms in Ecuador have deficient liquidity reserves and that smaller firms are the most affected. As the level of sales decreases, capital limitations arise, hence, proper cash management is fundamental. In these cases, when liquidity is affected, managers should focus on the short term, to guarantee the operational and financial stability of the firm. According to Opiela (2006), cash flow management is the only factor that will benefit or worsen a firm. Therefore, an efficient management of working capital is crucial for firms. Additionally, it can be a way for competitive positioning (Farris and Hutchison, 2003).

This document presents an analytical tool that allows monitoring of the liquidity conditions of firms in Ecuador. In this way, we analyze the situation of the firms using liquidity ratios and constructing the operating cash flow of the firms. Our results indicate that at least half of the firms in Ecuador were experiencing liquidity problems due to the COVID-19 pandemic and that their working capital exhibits a slow adjustment level in response to adverse situations.

2. Data

We use data from the annual financial statements that firms report to the Superintendencia de Compañías, Valores y Seguros (SCVS). From this data source, we obtain the total population of firms in Ecuador, which provides reliability and precision to the results. Our database has 73,104 firms for 5 years, and after debugging the financial balances[1], we obtain the final database with

[1] We debug our data to correct for the inconsistencies that administrative data sets often have. First, we exclude firms that present less than zero assets, liabilities, and equity. Second, we do not consider for the analysis, firms that present the sum of liabilities and equity different to the total amount of assets in more than USD 10.00. Finally, we eliminate

269,891 records (year-firm combinations).

The analysis we carry out contains information from the years 2015 to 2019, considering that the information for 2020 and 2021 is still incomplete due to the delays derived from the pandemic and the reporting schedules established. Since the operational flow of firms in Ecuador is stable, on average (see Table 1), the proposed analysis is also enlightening for the vulnerability of the current year.

Table1. Distribution of annual sales.

YEAR	Quartile 1	Quartile 2	Quartile 3	Median	Number of firms
2015	8,371	114,090	598,355	2,047,890	52,750
2016	5,835	95,179	516,086	1,835,567	53,370
2017	6,317	96,952	507,390	1,862,427	57,194
2018	8,132	104,099	538,974	1,994,779	56,249
2019	8,811	101,522	522,358	1,988,765	50,328

Note: The data shown characterizes the volume of sales, expressed in USD, reported by the firms to the SCVS**.**

3. Theoretical framework

We analyze the impact of demand contraction on operating cash flow, due to the COVID-19 shock, to evaluate the vulnerability of liquidity conditions of firms. We base our analysis on a basic structure proposed by De Vito and Gómez (2020). In this way, we define the net income (NI) of firms as:

$$NI = S - OPE - In - Tax \tag{1}$$

where S is the level of sales and OPE are the operating expenses. The interests and amortization are In, and Tax, which is the current taxes. From this definition, we can establish a relationship with the operating funds OF, as follows:

$$OF = NI + Depreciation + Deferred\ taxes \tag{2}$$

We obtain the operating cash flow (OCF) after subtracting the change in current assets and adding thechange in current liabilities to the operating funds:

$$OCF = OF - \Delta CA + \Delta CL \tag{3}$$

We obtain the change in operating cash flow due to changes in the level of sales after combining

firms that have zero sales and expenses or amortizations less than zero.

equations 1, 2, and 3 and differentiating concerning the level of sales[2]:

$$\frac{\partial OCF}{\partial \text{ Sales}} = 1 - \frac{\partial OPEX}{\partial \text{ Sales}} - \frac{\partial \text{ Tax}}{\partial \text{ Sales}} - \frac{\partial \Delta CA}{\partial \text{ Sales}} - \frac{\partial \Delta CL}{\partial \text{ Sales}} \quad (4)$$

In equation 4, changes in cash flow for sales do not depend on either interest payments or deferred taxes, under the assumption that it is unlikely for firms to change their capital structure or have the possibility of negotiating their level of debt in the short run. OPEX represents all costs associated with the daily operation of a company, except capital expenditures (CAPEX). Multiplying both sides of equation 4 by the level of sales, the equation can be expressed as follows:

$$\frac{\frac{\partial OCF}{\partial Sales}}{\text{Sales}} = \text{ Sales } - OPEX \times E_{OPEX} - \text{ Tax } \times E_{\text{tax}} - \Delta CA \times E_{\triangle CA} + \Delta CL \times E_{\Delta CL} \quad (5)$$

The elasticity E_i is $E_i = \frac{\frac{\partial i}{i}}{\frac{\partial \text{sales}}{sales}} E_i = E_{OPEX}, E_{\triangle CA} E_{\Delta CL}$. Finally, $Tax = (Sales - OPEX) - Depreciation - In) \times IT$. Where IT represents the income tax. In this equation we also assume that depreciation and interest do not vary with respect to sales (in the short run). Therefore, calculating the partial derivative of Tax with respect to sales and multiplying by (Sales/Tax) on both sides of the equation, we have:

$$E_{\text{tax}} = \frac{\frac{\partial \text{ Tax}}{\text{Tax}}}{\frac{\text{SSales}}{\text{Sales}}} = (\text{ Sales } - OPEX \times E_{\text{OPEX}}) \times \frac{IT}{\text{Tax}} \quad (6)$$

Substituting equation 6 into 5, the change (in USD) of OCF is as follows:

$$\partial OCF = \frac{\partial \text{ Sales}}{\text{Sales}} \times \left((\text{ Sales } - OPEX \times E_{OPEX}) \times (1 - IT) - (\Delta CA \times E_{\Delta CA} + \Delta CL \times E_{\Delta CL}) \right) \quad (7)$$

where $E_{OPEX}, E_{\Delta CA}, E_{\Delta CL}$ are the elasticity of operating costs, changes in current assets and changes in current liabilities with respect to sales. These elasticities help measuring the reaction capacity of firms and the capacity to scale up production. They are the degree of flexibility of firms to adjust to external shocks. For instance, with an elasticity of 0, fixed operating costs and working capital depending only on sales, operating cash flow would be reduced by the same dollar amount as gross revenues, for each percentage point decrease in sales. Which means that the change in dollars of operating cash flow would be equal to the change in dollars from after-tax sales, hence:

$$\partial OCF = \frac{\partial \text{ Sales}}{\text{Sales}} \times \text{ Sales } \times (1 - IT) = \text{ Sales } \times (1 - IT) \quad (8)$$

3.1.Liquidity and Cash Flow

[2] Note that the right-hand side of Equation 5 represents the dollar change in FCO for a 1% change in the level of sales.

To evaluate the level of liquidity in the different sales scenarios, we use the cash burn rate (CBR), which measures the rate at which a firm can sustain its operation without the need of external financing sources:

$$CBR = \frac{cash}{OCF + \partial OCF} \tag{9}$$

In our analysis, we estimate the number of months to consume/burn the cash reserves (if the CBR is negative) and the number of months to build cash reserves (if it is positive). In the case of an external shock, firms will most likely draw on their money reserves and other sources of immediate liquidity (short-term accounts receivable). If a firm has a negative CBR, then the firm has a high risk of becoming illiquid, and the magnitude of the ratio denotes the time it would take to consume its cash reserves to sustain its operations. Conversely, those firms with a positive CBR, maintain a stable level of liquidity that allows them to sustain their operations with a lower risk of illiquidity. However, the result of this indicator shows the number of months it will take for a firm to return the liquidity reserves (cash/banks) at the same level before the shock (the time it takes for a firm to recover).

4. Econometric Strategy

The estimation of the elasticities described above requires controlling for multiple aspects that could interfere with the sensitivity of liquidity to demand shocks. For instance, the structure, market, and administration heterogeneity of the firms are relevant for financial results. To control for all the unobserved factors that describe each firm and that are constant over time (firm-level fixed effects), we use a fixed effects estimation by dichotomous variables.[3] Hence, the main equation is:

$$\ln\left(y_{ijt}^{k}\right) = \alpha_{y}^{k} + \beta_{y}^{k} \ln\left(\text{ Sales }_{ijt}^{k}\right) + \lambda_i + \mu_j + \mu_t + \varepsilon_{ijt}^{k} \tag{10}$$

Where β_y^k is the coefficient of elasticity for sales, λ_i, is the fixed effect for each firm i, μ_j is the industry fixed effect determined by the ISIC classification and μ_t is the annual fixed effects (the factors that can change over time but affect firms equally).[4] To consider the effect of inflation, we deflated the variables used in the model using 2019 as the base year. To assess these effects by size and industry, we estimated the same equation, where the fixed effects corresponding to the level of the subset are absorbed.

5. Results

5.1.Elasticities

[3] It makes the treatment of fixed effects in unbalanced panel data more flexible. In an unbalanced panel data, not all observations are available over time for all firms.

[4] These three fixed effects are included because each of these effects contains variables that are assumed to be immutable across firms, industries, and time. For example, unobservable firm-level factors that remain constant over time are not necessarily the same at the industry level, as might be the case if a particular firm experiences a shock that is not necessarily an industry shock.

Table 2 shows the results of the elasticities calculated for all the economy, by firm size and sector. A main aspect to emphasize is that firms in Ecuador, on average, have greater adjustment capacity in their operating costs than in their working capital. For each dollar of reduction in sales, firms can adjust their working capital by USD 0.47, which reflects a slow degree of adjustment compared to operating costs (USD 0.94). Changing the purchase and sales schemes is more difficult than releasing expenses. However, these results must be taken skeptically, as the proposed methodology in the estimation of the elasticities does not allow for controlling for those phenomena that vary over time for each firm.

We find that small firms, on average, are more able to adjust their working capital than large and medium-sized firms. We infer that the reason for this result is that these types of firms are usually sole proprietorships, and their volume of sales and operations (mainly services) are relatively low. These conditions allow those firms to have more flexibility in the adjustment.

5.2. Cash Burn Ratio

To calculate the CBR, we test different demand contraction scenarios. We take as reference the average variation of sales concerning last year, which corresponds to 22%. Additionally, we propose a more pessimistic scenario, where firms face a generalized drop of 50% in sales. Table 3 shows the drop in sales and exports of different economic activities in Ecuador. In all scenarios, the CBR shows extreme values. For this analysis, we removed outliers; values that are more than 10 absolute deviations from the median (MAD)[5].

5.3. Drop in Sales 22%

The results of Table 4 show the current condition of the Ecuadorian firms. After the months of the pandemic (January to July of 2020), sales suffered a drop of 22% compared to 2019. According to this, it is possible to observe that 50.41% of the firms are in unfavorable liquidity conditions and are consuming their cash reserves to continue operating. From these firms, 23% would have up to six months of operation in the market, and after a year, 38% will no longer have the resources to continue operating. This condition is similar among the different sizes of firms, although it worsens for micro and small firms. On the contrary, large firms are in a better situation, however, 38% of these firms are also "burning" cash.

The results by sector show that agricultural activities have the lowest percentage of cash losses (40.95%). In terms of firms that have a better liquidity condition, only 13% will have a short-term recovery (1 year). Moreover, the results show that the sectors with the fastest short-term recovery are agriculture with 19,2% and financial services (and other services) with 15,82%.

[5] Firms with operating cash flow close to zero can bias the calculation, obtaining firms with a CBR greater than 100 years in absolute value.

Table 2. Calculation of elasticities

	General	Micro	Small	Medium	Large	Agriculture, extraction activities, construction	Manufacturing and logistics	Wholesale and retail trade	Information and communication	Finance, real estate, business services	Health, education, social, and community services
ELASTICITIES											
E_{OPEX}	0.94	0.90	0.98	0.92	0.96	0.93	0.90	0.98	0.88	0.96	0.98
$E_{\Delta CL}$	0.47	0.44	0.45	0.45	0.51	0.47	0.45	0.46	0.52	0.47	0.66
$E_{\Delta CA}$	0.46	0.46	0.36	0.36	0.52	0.31	0.53	0.42	0.44	0.54	0.63
OBSERVATIONS											
n_{OPEX}	128,306	51,864	26,611	25,737	12,287	23,554	25,986	48,403	4,554	20,777	4,873
$n_{\Delta CL}$	61,774	27,966	10,476	9,912	5,062	9,077	14,166	16,834	2,457	16,331	2,620
$n_{\Delta CA}$	63,911	29,850	11,262	10,108	4,640	9,035	14,197	17,536	2,571	17,657	2,674
NUMBER OF FIRMS											
G_{OPEX}	34,804	17,039	8,507	7,225	3,040	6,494	7,071	12,552	1,308	6,157	1,382
$G_{\Delta CL}$	25,757	12,157	4,572	4,182	2,029	3,765	5,906	6,970	1,036	6,876	1,100
$G_{\Delta CA}$	25,968	12,535	4,811	4,210	1,894	3,715	5,743	7,123	1,054	7,161	1,099
FIXED EFFECTS											
Firms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Years	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sector	✓	✓	✓	✓	✓	×	×	×	×	×	×

Notes: All estimated elasticities are significant at 1%. Size classification according to COPCI. The estimated values of the elasticities and other data regarding the estimation are based on the equation. Each row is a regression showing the results of the elasticity of **OPEX,** ΔCA, ΔCL for sales. The observations and groups vary due to the number of observations according to the estimated variable.
Elaboration: Authors**.**

Table 3. Variations in sales and exports

Economic activity	US$ million July 2020	Δ% Jun-Jul 2020	Δ%Jul 2019-2020	US$ million Jan-Jul 2020	Δ% Jan-Jul 2019-2020
Agriculture, forestry and fishing	951	-38.0	-17.3	7,838	-4.6
Mining and quarrying	330	24.5	-19.4	2,476	-14.4
Basic services: water and electricity	298	-5.7	-3.9	2,217	-0.6
Manufacturing industry	2,018	-7.5	-14.5	13,344	-18.1
Construction	245	3.2	-41.8	1,583	-42.5
Wholesale and retail trade	5,774	-8.0	-20.1	38,600	-21.6
Transportation and storage	394	-58.1	-35.5	3,849	-24.6
Accommodation and food service activities	103	-17.7	-57.8	920	-44.6
Financial and insurance activities	363	15.2	-14.6	2,467	-9.6
Real estate activities	124	-33.5	-37.2	960	-31.1
Public administration	71	16.9	-25.2	440	-29.3
Other services	1,446	-23.9	-26.0	10,873	-24.1

Notes: information taken from the Internal Rent Service (SRI, in Spanish).

Table 4.CBR – scenario of 22% drop in sales

CBR Category		General	Micro	Small	Medium	Large	Agriculture, extraction activities, construction	Manufacturing and logistics	Wholesale and retail trade	Information and communication	Finance, real estate, business services	Health, education, social, and community services
Cash Burn	60+ months	**10.25**	9.06	10.24	12.19	14.98	7.76	11.08	11.22	11.76	9.53	5.68
	(24,60] months	11.58	10.53	13.38	14.47	10.18	9.35	12.45	12.77	14.38	10.49	14.63
	(12,24] months	9.67	9.39	11.06	10.55	6.57	6.86	11.26	9.78	10.92	9.33	13.06
	(9,12] months	3.25	3.32	3.96	3.14	1.27	2.49	3.58	3.07	3.33	3.29	6.34
	(6,9] months	3.98	4.11	4.68	3.36	1.68	3.16	4.59	3.52	3.73	3.98	9.27
	(3,6] months	4.63	5.19	4.98	3.64	1.23	3.74	5.56	3.91	4.58	4.71	13.06
	[0,3] months	7.05	9.53	5.33	2.87	0.62	7.59	6.85	6.36	6.60	7.40	17.24
Cash Construction	(0,3] months	5.71	7.79	3.28	2.14	2.01	8.43	3.88	4.33	5.10	7.22	3.66
	(3,6] months	2.89	3.20	2.46	2.60	2.22	4.35	2.34	2.26	2.75	3.40	1.57
	(6,9] months	2.40	2.54	2.35	1.97	2.54	3.19	1.95	2.12	1.57	2.77	1.05
	(9,12] months	2.27	2.24	2.38	2.19	2.59	3.23	1.77	2.00	1.57	2.43	1.05
	(12,24] months	10.81	10.48	10.99	11.47	10.83	14.79	9.34	10.39	10.26	10.40	4.38
	(24,60] months	13.61	12.07	14.02	15.51	21.91	14.06	13.42	14.71	13.20	13.38	5.68
	60+ months	**11.91**	10.53	10.88	13.89	21.38	11.00	11.93	13.56	10.26	11.68	3.33
Total firms		36,822	37,274	21,969	7,267	5,571	2,437	5,293	8,771	9,719	1,530	10,391

Note: The values presented within the table represent the percentage of firms that are in each time category. For instance, for the general case of firms that are burning cash, 10.25%. will have reserves to finance its operation for more than 60 months. Similarly, 11.91% will take more than 60 months to recover their cash levels.

Table 5.CBR - scenario of 50% drop in sales

CBR Category		General	Micro	Small	Medium	Large	Agriculture, extraction activities, construction	Manufacturing and logistics	Wholesale and retail trade	Information and communication	Finance, real estate, business services	Health, education, social, and community services
Cash Burn	60+ months	**8.57**	7.33	7.58	10.25	20.49	8.81	8.36	10.76	6.75	7.39	5.68
	(24,60] months	14.31	11.80	15.29	18.82	20.53	11.74	13.93	17.51	15.44	12.77	14.63
	(12,24] months	13.52	12.19	15.56	17.28	11.48	10.23	14.24	14.39	19.18	12.84	13.06
	(9,12] months	5.46	5.24	6.59	6.06	3.04	4.00	5.85	5.49	6.75	5.61	6.34
	(6,9] months	6.97	6.78	8.18	7.64	3.25	5.30	7.90	6.08	8.22	7.02	9.27
	(3,6] months	8.45	8.80	10.37	7.77	3.41	5.74	10.26	6.96	9.22	9.12	13.06
	[0,3] months	11.45	14.40	10.38	6.28	1.70	9.85	12.99	9.50	10.76	11.98	17.24
Cash Construction	(0,3] months	4.75	6.65	2.46	1.49	1.74	7.07	3.31	3.62	4.48	6.11	3.66
	(3,6] months	1.88	2.21	1.52	1.71	1.14	3.05	1.60	1.49	1.20	2.23	1.57
	(6,9] months	1.56	1.75	1.24	1.40	1.26	2.14	1.21	1.26	1.07	1.76	1.05
	(9,12] months	1.38	1.49	1.26	0.99	1.05	2.52	1.15	1.10	1.00	1.59	1.05
	(12,24] months	5.45	5.73	5.20	5.05	5.31	8.07	4.65	4.97	3.74	5.70	4.38
	(24,60] months	9.01	8.87	8.93	8.72	10.95	11.88	7.99	8.36	8.02	9.40	5.68
	60+ months	7.22	6.74	5.46	6.54	14.65	9.60	6.55	8.51	4.14	6.48	3.33
	Total firms	36,822	21,696	7,167	5,445	2,465	5,279	8,577	9,611	1,496	10,232	1,531

Note: The values presented within the table represent the percentage of firms that are in each time category. For example, for the general case of firms that are burning cash, 8.57%. will have reservesto finance its operation for more than 60 months. Similarly, 7.22% will take more than 60 months to recover their cash levels

5.4.Simulation

The results reveal the current vulnerability of liquidity indices from Ecuadorian firms, but only for a 50% reduction in demand. Likewise, it is assumed that firms can react homogeneously (as we leave the elasticity the same, which implies firms reacting equally). This assumption is hardly credible due to the heterogeneity in the working capital structure of the firms. For example, the amount of credit that a firm establishes, the possibility of offering flexible payment conditions (more or less days), the level of inventory, and the negotiating power to defer payments.

Subsequently, we develop a simulation to evaluate all possible combinations of the factors mentioned above. We add a factor to equation 5 that allows the elasticities to vary from 0 to β_y^k. Remember that we consider the elasticities of operating expenditure, changes in current assets and changes in current liabilities. We consider two factors and show results allowing one to vary while the other remains fixed. In this way, we assume that the firms make joint decisions for the placement of current assets and current liabilities. Thus, these factors are adjusted in the same proportion while the elasticity of operating expenditure is fixed (scaling-up production) and vice versa. With these results, it is possible to evaluate the vulnerability of the liquidity of Ecuadorian firms.

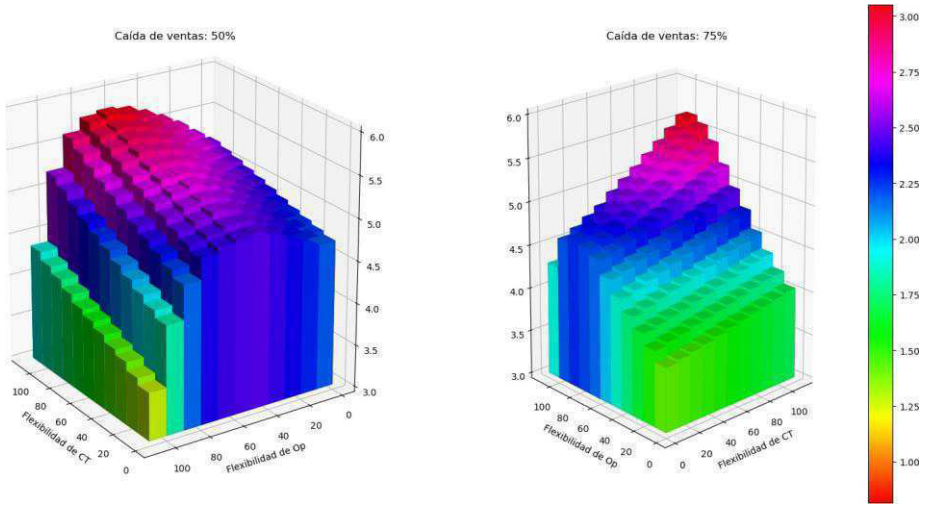
Table 6. Simulation

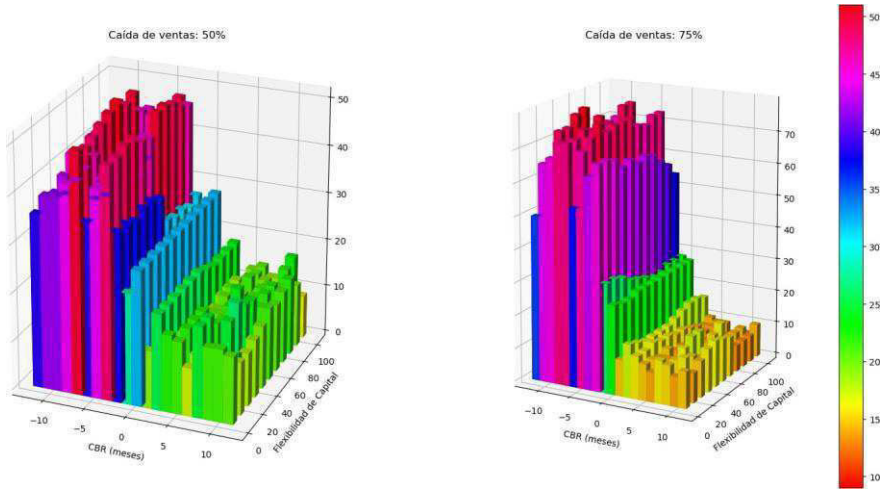
Operations Factor (%) \ Working Capital Factor (%)	0	10	20	30	40	50	60	70	80	90	100
0	-7.38	-7.43	-7.46	-7.49	-7.51	-7.54	-7.58	-7.60	-7.65	-7.67	-7.70
10	-7.73	-7.76	-7.78	-7.83	-7.86	-7.90	-7.93	-7.97	-8.00	-8.05	-8.07
20	-8.08	-8.11	-8.16	-8.21	-8.24	-8.27	-8.30	-8.34	-8.39	-8.42	-8.48
30	-8.48	-8.52	-8.57	-8.61	-8.65	-8.71	-8.76	-8.80	-8.85	-8.89	-8.95
40	-8.92	-8.97	-9.04	-9.08	-9.12	-9.16	-9.22	-9.28	-9.32	-9.36	-9.42
50	-9.38	-9.43	-9.48	-9.55	-9.61	-9.66	-9.73	-9.80	-9.86	-9.92	-9.98
60	-9.87	-9.94	-10.03	-10.09	-10.18	-10.24	-10.31	-10.39	-10.46	-10.53	-10.60
70	-10.45	-10.52	-10.61	-10.69	-10.78	-10.85	-10.94	-11.03	-11.13	-11.16	-11.25
80	-10.98	-11.06	-11.18	-11.27	-11.35	-11.44	-11.52	-11.67	-11.76	-11.87	-11.96
90	-11.53	-11.64	-11.73	-11.84	-11.96	-12.04	-12.16	-12.27	-12.39	-12.55	-12.68
100	-12.03	-12.15	-12.27	-12.42	-12.50	-12.62	-12.79	-12.91	-13.03	-13.17	-13.33

Table 6 shows the results of the simulation for a 50% drop in the level of sales when the firms consume their cash reserves and liquid assets to finance their operation (negative CBR). Unlike the previous results, which showed the frequency of firms for each time range, here we show the median CBR for each result (ordered pair) of the simulation. In other words, we evaluate the condition of 50% of the firms in Ecuador facing different combinations of adjustments in working capital and operations. The results show that the greater the firms' ability to react, the longer their survival time. The complete adjustment capacity (100, 100) would double the time that firms with

liquidity problems can withstand to adverse environmental conditions. Hence, those firms with a lower adjustment capacity in their operations have approximately 7,38 months to exhaust their most liquid assets (cash), while those firms that have a great adjustment capacity have 13,33 months (80% more persistence in the market).[6]

Graph 1. Simulation results for a dropdown of sales in 50% and 75%.





[6] Results by industry are available upon request.

6. Recommendations

The panorama encountered in this study suggests firms develop strategies of control and management of working capital, planning of expenses, and taking advantage of the scale of production, to be more prepared for a liquidity crisis. In the same line, the current situation forces firms to modify their operating scheme and adapt to the "new normal".

Thereafter, we suggest different aspects for firms to consider:

Form a cash committee: Form a team of directors to evaluate cash outflows and establish priorities. This team should analyze which payments are urgent and which have the option of deferment.
Define a communication strategy: In the case of making decisions that change the conditions of payments and collections transactions, it is important to have clear ways of communicating this change to creditors, suppliers, clients, and employees, among others.
Planning under different scenarios: It is relevant to account that shipping, delivery, and other logistics factors have changed. Financial projections should consider different scenarios (pessimistic and optimistic) including the greatest number of factors. In addition, intuition and experience have a fundamental role in periods of uncertainty, as quantitative forecasts with past information can have great margins of error and may be uninformative.
Explore new modalities: The pandemic has shown that telecommuting can be effective for some areas of work and economic sectors. Firms should define and classify the jobs that can be permanently adapted to this modality and guarantee biosecurity measures for those jobs that are not suitable for teleworking.

Finally, something interesting for future research might be to investigate whether firms with stronger pre-crisis liquidity (e.g., higher cash reserves or better access to credit) performed differently during the shock. Moreover, analyze whether firms exposed to other types of shocks, such as exporters or importers, could have been affected differently.

References

Camino-Mogro, S., Ordeñana, X. & Portalanza, A. (2020). Flujo de Caja y días de Resistencia sin efectivo en tiempos de Covid-19: El Caso de Ecuador. Policy Report. Universidad Espíritu Santo, Ecuador

Centro de Investigaciones Económicas (julio 2020). Boletín de Política Económica, 10ma Edición, FCSH-ESPOL.

De Vito, A., & Gómez, J. P. (2020). Estimating the COVID-19 cash crunch: Global evidence and policy. *Journal of Accounting and Public Policy*, *39*(2), 106741.

Hutchison, P. D., & Farris II, M. T. (2003). Cash-To-Cash Assessment and Benchmarks in The Oil and Gas Industry. *Oil, Gas, & Energy Quarterly*, *51*(3), 479-491.

OECD (2020a). OECD Economic Outlook - Interim Report March 2020. *OECD Publishing*, Paris.

Opiela, N. (2006). Keeping small-business cash flow on track. *Journal of Financial Planning*, *19*(7), 26.