FINANCIAL STATEMENTS ANALYSIS: THE FUNDAMENTALS OF LIQUIDITY RISK IN TIMES OF ECONOMIC DISTRESS

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Executive Summary *Even for healthy businesses, a liquidity crisis can suddenly arise when economic and financial circumstances become strained, like during the most recent unprecedented climate of change due to COVID-19 and its impact on economies worldwide. Such an unforeseen event can be triggered by a reduction in revenue, an abrupt business disruption or tense financing facilities. Most firms are routinely monitoring their liquidity risk to ensure they remain solvent as going concerns. This article explains the fundamentals of the liquidity risk and how it can be measured to help underwriters make sound financial underwriting decisions in times of economic downturn.*

Introduction

During economically distressed times, a company may have insufficient funds to meet its financial commitments in a timely manner and thus becomes illiquid. In the normal cash flow cycle, the business must make payments to its suppliers before it gets paid for the goods and services it provides. Therefore, for a business to remain solvent, the working capital[1] must be positive; whereby, the current assets would typically exceed current liabilities on a continuous basis. Unless the financial markets are also in a credit crunch, a company-specific liquidity crisis can be resolved with liquidity injection, provided the company is otherwise not facing bankruptcy.

As underwriters, liquidity and cash flow are two areas of financial statement analysis that are not typically on our radar. We are mainly concerned about the overall solvency of a business on an ongoing basis, which includes knowing if the business generates a profit at the end of the accounting period, and how growth in shareholder equity impacts buy and sell values and exposure to taxable capital gains in the future. Typically, the cause of many business failures originates from the inadequate management of available cash or the lack of access to additional financing facilities. According to Intuit's survey in 2019[2], over two-thirds of small business owners had cash flow concerns, and about 61% have reported regular cash flow difficulties. (Small businesses[3] in Canada are defined as having between 5 and 100 employees, an authorized credit limit of $500,000 or less, or annual revenue of $5 million or less.)

In periods of economic distress and business disruption, when there is a major decrease of the demand for goods and services, the short-term financial survival of the firm may be difficult. However, financial statements may not be available for 12 to 18 months so that underwriters can assess the accounting impact on the business numbers. From a financial underwriting standpoint, underwriters should look at the preparedness of a corporation to weather a future liquidity crunch, bearing in mind the industry sectors most affected during the COVID-19 pandemic have not been limited only to accommodation and restaurant services, retail trade, transportation (airlines and taxi), oil and gas extraction, real estate, automobile manufacturing and construction, but also to their subcontractors[4] and to related industries and service businesses in a cascading effect.

Is there a magic number or ratio that defines a favorable vs. an adverse cash position? Not really. Liquidity is dynamic and can change according to economic conditions. This article explains liquidity risk and describes methods for measuring a firm's exposure to such risk with appropriate ratios. Generally, the higher a liquidity ratio, the better the ability of a company to satisfy its short-term obligations.

Defining liquidity risk

Liquidity risk is defined as the risk a company may encounter with meeting its short-term financial obligations that need to be settled by providing cash. In many instances, capital is locked up in long-term productive assets that cannot be converted to cash in a timely and economic way to settle accounts payable.[5] There are two types of liquidity risks:

- *Funding liquidity* is a cash flow risk concerned with whether the firm can meet its current liabilities as they become due. It manifests itself as credit risk, or the inability to satisfy current liabilities, and it produces defaults.
- *Market liquidity* is a function of how easily and quickly a capital or operating asset, a security or a commodity can be traded and converted into cash. Selling operating assets – specifically at a price lower than the market price – can be hazardous and may threaten the future revenue capabilities of the company. (This risk is out of the scope of this article.)

Market and funding liquidity risks can compound each other, as it is difficult to sell when other counterparties face their own financial difficulties. It is challenging to obtain financing when the collateral may be hard to sell. In addition, if a counterparty owes payment (accounts receivable) and defaults, then the firm will need to raise cash from another source to make up the shortfall or possibly default. The process could spread as a domino effect through the economy.

A *cash crunch* is an abrupt and usually short-lived period when the business is unable to meet immediate obligations, such as pay wages, salaries and benefits, or settle accounts payable due to suppliers and other operating expenses. Although such a situation may occur at any time, it is more likely to happen when there is rapid economic disruption. The situation can be worsened when the entire economy enters a recession or depression.

How could a liquidity gap, the difference between the liquid assets and the upcoming liabilities, be overcome? There are basically three options:

a. *Internal financing*: The firm issues new shares and receives a fresh cash infusion from its existing or new shareholders. While this might be the most preferred method to raise additional capital, it is hindered by technical and regulatory delay. As well, the resultant dilution of shares would not be popular with existing shareholders, given that some may not be able to contribute due to their own financial constraints.
b. *External financing*: The business accesses its existing lines of credit, banking over-draft facilities, or issues letters of credit. This only works if the business has enough remaining available credit. Banks usually do not have enough funds available, if most of its customers were to draw funds from their credit facilities all at once when economic conditions deteriorate. Hence, the banks may also need support from a central bank to help bridge the increased cash demands.
c. *Cost savings*: The last immediate option is for a business to lower its operating expenses with productivity and efficiency savings to counter the reduced or lack of business activity. As seen in the last two major economic downturns (global financial crisis of 2008 and pandemic of 2020), some corporations terminated, furloughed or temporarily laid off portions of their workforce to ensure the survival of their business, while waiting for different levels of government to intervene with job protection measures.

Typically, the analysis of liquidity risk is performed through a set of liquidity ratios with progressive, stringent measurements.

Measuring liquidity risk with ratio analysis

In a nutshell, a business participates in two kinds of financial transactions:

- Those that increase the cash balance (cash inflow).
- Those that use cash and decrease the cash balance (cash disbursement).

As mentioned above, liquidity refers to the firm's ability to convert short-term assets into cash quickly and without too much discounting of that asset's market value. Liquidity ratios assist the firm's owner to improve the cash management of their business. They also help the external stakeholders to assess the corporation's counterparty risk in terms of credit risks. Good cash flow planning and management can identify potential troubles in the early stages, when it is possible to make the necessary changes. Businesses lacking enough cash flow may have difficulties securing on-going banking facilities, or may go into receivership,[6] face bankruptcy and ultimately liquidation. Liquidity ratios are calculated to determine a debtor's ability to pay off short-term obligations without raising additional capital and to measure the margin of safety as a going concern.[7]

A liquidity analysis is performed by looking at specific numbers found in the balance sheet and the statement of cash flows. The income statement is not considered a good measure of cash flow, because it is prepared on an accrual basis.[8] Typically, the cash method immediately recognizes money inflows and outflows,

while the accrual method focuses on the anticipated recognition of revenue and expenses, and thus can be subject to accounting manipulation. To illustrate the ratios with an example, this author will provide the liquidity ratios for a large company with publicly available information.

Common measurements of liquidity risk

A liquid firm is a business that can meet its current liabilities and short-term obligations. It is not unusual for a firm to show an accounting profit on its income statement but not have sufficient cash to pay its accounts payable (bills due).

Current ratio

One of the most frequently used and best-known ratios in analyzing a balance sheet is the current ratio. Current assets, which are expected to be converted to cash within a year, and current liabilities, which are obligations coming due within the next accounting period, are compared in this ratio. The current ratio compares a company's ability to retire its current liabilities with its current assets. (See below)

Classically, the higher the current ratio, the higher the likelihood the firm can pay its current liabilities. A ratio less than 1 may indicate liquidity issues. Conversely, a very high current ratio may mean there is excess cash that should possibly be invested elsewhere in the business or there is too much inventory. Most analysts believe a ratio between 1.2 and 2.0 is a comfortable standard minimum.

Quick ratio

The current ratio subtracts the inventory and prepaid expenses from current assets. The quick ratio, also known as the acid-test, measures a company's capacity to meet its current liabilities with its most liquid (quick) assets. Quick assets are current assets that can be converted to cash within 90 days or less. The rationale is that inventory cannot quickly be converted into cash, because the business needs to have a buyer before it can receive a payment. Finding a buyer in an unattractive economic environment may not always be possible without a discount. (See below)

The quick ratio is more conservative than the current ratio, because it excludes the inventory which may take time to liquidate at an appealing price. In order to stay solvent and be able to pay current liabilities without having to sell inventory at a discount, the quick ratio should be equal or higher than 1 and is typically one-half the current ratio.

Current ratio

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Curent liabilities}}$$

Current ratio = Current assets / Current Liabilities

	N	N-1	N-2	N-3	AVG
Current assets	7,516,000	6,301,000	5,297,000	4,347,000	
Current liabilities	7,750,000	5,676,000	5,060,000	4,424,000	
Current ratio	**0.97**	**1.11**	**1.05**	**0.98**	**1.03**

Quick ratio

There are two ways to calculate the quick ratio:

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{inventory} - \text{prepaid expenses}}{\text{Curent liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Cash \& } \textit{Cash equivalents} + \textit{Marketable securities} + \textit{Accounts receivable}}{\text{Curent liabilities}}$$

Quick ratio = (Current assets less investory) / Current liabilities
Quick ratio = (Cash & equivalents plus Marketables securities plus Accounts receivable) / Current liabilities

	N	N-1	N-2	N-3	AVG
Current assets	7,516,000	6,301,000	5,297,000	4,347,000	
less inventory	- *212,000*	- *220,000*	*206,000*	*186,000*	
less pre-paid expenses	- *332,000*	- *417,000*	*325,000*	*349,000*	
Quick assets	6,972,000	5,664,000	5,828,000	4,882,000	
Current liabilities	7,750,000	5,676,000	5,060,000	4,424,000	
Quick ratio	**0.90**	**1.00**	**1.15**	**1.10**	**1.04**

Cash ratio

The most stringent of liquidity ratios, cash ratio is seldom used, as it may not be realistic for a firm to fully cover its current liabilities with cash and cash equivalents.[9] The cash ratio indicates a business's capacity to repay short-term obligations with only cash or near-cash resources. It is also an indicator of the firm's worst-case scenario. Of note, near-cash resources are usually marketable securities. During a financial crisis, these securities' present market value may be much lower than the book value reported in a balance sheet that has been prepared many months prior. (See below)

The cash ratio should be equal or higher than 1 for the firm to be able to pay all current liabilities with available cash, cash equivalents and marketable securities. A high cash reserve may also indicate the company is accumulating too much liquid funds and not using its cash in the most beneficial manner by investing in other profitable projects.

In the typical cash flow cycle, very few companies will have enough liquid assets to fully cover current liabilities. When a business holds large amounts of cash on its balance sheet, this would likely be indicative of a defensive utilization of its liquid resources, because the money could be:

- Returned to its shareholders via dividends.
- Required to accelerate the repayment of long-term liabilities.
- Used to repurchase its own outstanding shares (share buyback[10] to demonstrate to investors the business has sufficient cash set aside for emergencies, thus increasing the per-share value).
- Reinvested into the business to generate higher returns.

The further analysis of the free cash flow,[11] which is equal to operating cash flow less capital expenditures, may be suggestive of the firm's underlying near future financial agility, but is outside the scope of the present review.

Supplemental liquidity measurements

Operating cash flow ratio

If business was disrupted by a reduction in revenue, financial obligations would still need to be paid. This ratio measures the number of times a company can pay off short-term liabilities with the cash generated by its core business operations within the same time period. This ratio is preferred by analysts as a more accurate measure of liquidity. (See below)

A high number is preferable and indicates the firm has generated more cash in the specific period than it needs to pay off current liabilities. A ratio below 1 would be a warning signal that more liquidity is needed. Banks look closely at this ratio to determine the risk of default before issuing new or extending additional financing to the business.

Cash ratio

$$\text{Cash ratio} = \frac{\text{Cash \& } \textit{Cash equivalents} + \textit{Marketable securities}}{\text{Curent liabilities}}$$

Cash ratio = (Cash plus Cash equivalents) / Current liabilities

	N	N-1	N-2	N-3	AVG
Cash & Cash equivalents	2,090,000	630,000	642,000	787,000	
Marketable securities	3,799,000	4,077,000	3,162,000	2,192,000	
Cash assets	5,889,000	4,707,000	3,804,000	2,979,000	
Current liabilities	7,750,000	5,676,000	5,060,000	4,424,000	
Cash ratio	**0.76**	**0.83**	**0.75**	**0.67**	**0.75**

Operating cash flow ratio

$$\text{Operating cash flow ratio} = \frac{\text{Operating Cash Flow}}{\text{Curent liabilities}}$$

Operating cash flow ratio = Cash flow from operations / Current liabilities

	N	N-1	N-2	N-3	AVG
Cash flow from operations	5,712,000	3,470,000	2,738,000	2,421,000	
Current liabilities	7,750,000	5,676,000	5,060,000	4,424,000	
Operating cash flow ratio	**0.74**	**0.61**	**0.54**	**0.55**	**0.61**

Cash flow adequacy ratio
The cash flow adequacy ratio measures whether the cash generated by a company's core operations is enough to cover capital expenditures, annual repayments of long-term debt, or committed dividends to preferred shareholders. (See below)

A ratio of less than 1 means the firm must either liquidate cash equivalents or marketable securities or obtain additional external funding to meet its capital expenditures, long-term debt repayment and dividend policy commitment. The cash flow adequacy ratio is a good forward-looking gauge of whether or not the firm is a self-sustaining enterprise that does not need to rely on additional financing.

Defensive interval ratio
This is a financial efficiency indicator and a variation of the quick ratio. It calculates the number of days a business could sustain running on the liquid assets it currently has on hand, by comparing the sum of cash, cash equivalents and marketable securities to operating expenses. It is one of the most powerful liquidity ratios, as it indicates how long a company could operate without disinvesting non-current assets[12] or have to reach out to external financing resources. It is generally accepted to be an excellent proxy for the liquidity standing of a business, and it is measured in days. (See below)

The calculation is based on the so-called defensive assets, which include cash, cash equivalents and marketable securities, but does not incorporate inventory and pre-paid expenses. Also, it typically excludes accounts receivable, since they may not be easily collected in times of general economic and financial distress.

The annual operational expenses are the sum of the cost of sales and operating expenses (both numbers can be found in the income statement and do not include non-cash expenses,[13] such as depreciation and amortization). There is no target number but if too high, the firm may be hoarding cash and not employing its liquid assets efficiently to generate higher returns. If too low, the business may not survive even a temporary business interruption.

Cash flow adequacy ratio

$$\text{Cash flow adequacy ratio} = \frac{\text{Cash flow from operations}}{\text{Long term debt paid for the period} + \text{fixed assets purchased} + \text{cash dividends distributed}}$$

Cash flow adequacy ratio = Cash flow from operations / (Long term debt paid + fixed assets purchased + cash dividends

	N	N-1	N-2	N-3	AVG
Cash flow from operations	5,712,000	3,470,000	2,738,000	2,421,000	
less Long-term debt paid	- 1,084,000	- 1,706,000	- 814,000	- 2,275,000	
less Fixed assets purchased	- 2,025,000	- 2,436,000	- 2,422,000	- 2,921,000	
less Cash dividends distributed	-	-	-	-	
Cash flow adequacy ratio	**1.84**	**0.84**	**0.85**	**0.47**	**1.00**

Defensive interval ratio

$$\text{Defensive interval ratio} = \frac{\text{Liquid (quick) assets}}{\text{Daily operating expenses}}$$

Defensive intervall ratio = Liquid (quick) assets / Daily operating expenses

	N	N-1	N-2	N-3		AVG
Liquid (quick) assets	6,972,000	5,664,000	5,828,000	4,882,000		
Annual operational expenses	17,481,000	16,507,000	14,888,000	13,332,000		
less deprectiation & amortization	- 1,986,000	- 1,717,000	- 956,000	- 816,000		
Defensive intervall ratio	**164**	**140**	**153**	**142**	**days**	**150**

Conclusion

Cash is traditionally the bedrock in times of financial distress. It is the blood that nourishes the daily operations of any enterprise. As witnessed during the most recent unprecedented and unforeseen climate of change due to the COVID-19 pandemic, the balance sheets of many economic agents, such as world economies, financial institutions, businesses and households, are not built for times when society abruptly hits the pause button – to the point of triggering an economic downturn.[14] While there are no generally accepted standards among analysts as to how liquid a firm should be, the ratios as described herein can be useful. Care must be taken with interpretation of any ratio in isolation, as hasty calculations may not tell the whole story.

When economic and financial circumstances become strained, the immediate going concern of any business venture generally correlates with the amount of available liquid assets. Without readily accessible cash, cash equivalents or marketable securities, a business could be forced to take measures to reduce its operational expenses and delay its accounts payable, or worse, face liquidation.

A liquidity crisis might be resolved with a cash injection, provided the financial markets are well functioning, and if the company can remain solvent. Further additional solvency analysis is focused on the longer-term capability of a firm to honor long-term debt. Its specific examination is outside the scope of this discussion.

While the cash ratio appears to be the least used in traditional financial analysis, its importance may significantly grow in times of economic and financial distress, when capital and consumer markets are disrupted. If a company is falling into insolvency, the use of the cash ratio, which assumes nothing about the company's ability to collect its accounts receivable or to sell its inventory at an attractive price, might be the most realistic of the liquidity ratios. Despite its calculation complexity, the defensive interval ratio, which compares the business's defensive (liquid) assets to its daily operating expenses, is possibly the optimal ratio when determining the firm's likelihood to survive a sudden liquidity crisis.

Additional resources

1. *Financial Analysis with Microsoft Excel*, 9th Edition, Timothy R. Mayes.
2. Investopedia, available at www.investopedia.com/terms/l/liquidityrisk.asp).
3. Corporate Financial Institute, available at https://corporatefinanceinstitute.com/resources/knowledge/finance/funding-liquidity-risk/.
4. QuickBooks Canada, available at https://quickbooks.intuit.com/ca/resources/cash-flow-hub/.

Notes

1. www.investopedia.com/terms/w/workingcapital.asp.
2. https://quickbooks.intuit.com/r/cash-flow/state-of-cash-flow-report/.
3. www.benchmarklaw.ca/2019/09/28/definition-of-a-small-business-in-canada/.
4. https://hillnotes.ca/2020/04/08/impacts-of-covid-19-on-selected-sectors-of-canadas-economy/.
5. www.investopedia.com/terms/a/accountspayable.asp.
6. www.pwc.com/ca/en/services/insolvency-assignments/what-is-receivership.html.
7. www.investopedia.com/terms/g/goingconcern.asp.
8. www.investopedia.com/terms/a/accrualaccounting.asp.
9. www.investopedia.com/terms/c/cashequivalents.asp.
10. www.investopedia.com/terms/b/buyback.asp.
11. www.investopedia.com/terms/f/freecashflow.asp.
12. www.investopedia.com/terms/n/noncurrent-assets.asp.
13. www.investopedia.com/terms/n/noncashcharge.asp.
14. See Richardson GMP *Investor Strategy* newsletter dated April 6, 2020, page 4.

About the Author

Philippe Aussel has over 42 years of life reinsurance underwriting experience and has worked for SCOR SE since 2003, having started at Munich Re in 1977. *ON THE RISK* has published numerous articles authored by Philippe from 2012 to current date. Philippe holds a degree in Insurance Management from the German Insurance Academy (Deutsche Versicherungsakademie). In 1996, he wrote his final study paper on "Financial Statement Analysis for the Non-Professional Reader."