

# Did you save some cash for a rainy COVID-19 day? The crisis and SMEs

Marc Cowling, Ross Brown, Augusto Rocha

Date of deposit	11 09 2020
Document version	Author's accepted manuscript
Access rights	Copyright © 2020 The Author(s). All rights reserved. This work has been made available online in accordance with publisher policies or with permission. Permission for further reuse of this content should be sought from the publisher or the rights holder. This is the author created accepted manuscript following peer review and may differ slightly from the final published version.
Citation for published version	Cowling, M, Brown, R & Rocha, A 2020, 'Did you save some cash for a rainy COVID-19 day? The crisis and SMEs', International Small Business Journal, vol. OnlineFirst.
Link to published version	<a href="https://doi.org/0.1177/0266242620945102">https://doi.org/0.1177/0266242620945102</a>

Full metadata for this item is available in St Andrews Research Repository at: <https://research-repository.st-andrews.ac.uk/>



# **Did you save some cash for a rainy COVID-19 day? The crisis and SMEs**

**Key Words: Cash balances; SMEs; Precautionary Saving; Covid-19; Risk**

## **Abstract**

As Covid-19 spreads across the globe a common public policy response has been to enforce the temporary closure of non-essential business activity. In some countries, governments have underwritten a proportion of the wage income for staff forced to furlough or broadened their welfare systems to accommodate newly laid off workers or small business owners. Whilst these actions are helpful, they do not explicitly address the lack of sales trading activity on business income and cash balances. In this new research we identify what types of businesses have been increasing their cash holdings in the lead up to Covid-19 as an indication of what types of SMEs are most at risk if the lockdown extends for a protracted period of time. We find that only 39% of the of businesses were bolstering their cash balances leading up to Covid-19 which suggests that 61% of businesses are at risk of running out of cash, including 8.6% that had no retained earnings at all. At heightened risk are micro businesses in both cases. The importance of precautionary saving for SMEs is critical to enhance resilience when Black Swan events occur.

## 1. Introduction

This commentary focuses on the likely impact of the Covid-19 crisis on smaller businesses and provides new estimates of how many businesses are at heightened risk of simply running out of cash, even in the presence of enhanced government support for debt based policy responses. This builds upon our knowledge of how smaller businesses were affected by the last crisis in October 2008, when the world experienced a Global Financial Crisis (GFC) that led to a large contraction in the availability of credit and bank lending which disproportionately impacted on smaller businesses (Buckley, 2011). All crises, whatever their origin, have an immediate and severe effect on global financial markets which quickly feeds through to the real economy through a contraction of credit supply and an increase in the cost of finance. Smaller businesses face very specific and unique problems around access to external capital which relate to their informational opacity (Stiglitz and Weiss, 1981) and their private and closely held ownership structures (Cowling and Matthews, 2018; Cressy and Olofsson, 1997). These problems are often compounded by a lack of physical and tangible assets that can be used as collateral against loans (Coco, 2000). This means that many smaller businesses have an over-reliance on internally generated funds to capitalise their operations and provide the necessary liquidity to fund their day-to-day operations. As such, the Covid-19 induced economic lockdown has the potential to put large numbers of small businesses at severe risk of simply running out of money.

In this new research we identify what types of businesses have been increasing their cash holdings in the lead up to Covid-19 as an indication of what types of SMEs are most protected against risk of running out of cash if the current global lockdown extends for a protracted period of time. Why is this important? If hundreds of thousands of smaller businesses are at risk of running out of cash given a lengthy period of time when sales incomes are either falling or have stopped completely, then this represents a systemic risk to most economies given the predominance of smaller businesses in the economic landscape. This issue is also vitally important from a policy perspective. Despite, the implementation of several government-backed loan schemes such as the Coronavirus Business Interruption Loan Scheme designed to provide access to finance during the crisis, most SMEs typically respond to extreme uncertainty by avoiding additional borrowing in case they default on new loans<sup>1</sup>. This means policy responses to the crisis may be inadequate or inappropriately designed<sup>2</sup>.

In respect of the so what does this all mean in terms of potential implications, there is the macroeconomic systemic risk outlined above, but also a micro level risk if it is particular types of smaller businesses that are most at risk of running out of cash which could put the incomes and livelihoods of many dependent families at risk. Whilst our findings relate specifically to the UK, we believe that they have wider resonance,

---

<sup>1</sup> [https://www.british-business-bank.co.uk/ourpartners/coronavirus-business-interruption-loan-scheme-cbils-2/?gclid=EAIaIQobChMIifbRko2G6gIVme3tCh3VNwr\\_EAAYASAAEgK8-fD\\_BwE](https://www.british-business-bank.co.uk/ourpartners/coronavirus-business-interruption-loan-scheme-cbils-2/?gclid=EAIaIQobChMIifbRko2G6gIVme3tCh3VNwr_EAAYASAAEgK8-fD_BwE)

<sup>2</sup> Research on enterprise policy frameworks shows this policy response is common across most advanced OECD economies (OECD, 2020).

particularly in developing countries where financial systems are less well developed and capital constraints are magnified. For these reasons, internal financial management is critical to the success and survival of smaller businesses. Hence understanding more about precautionary saving in smaller businesses in the lead up to the Global pandemic is a critical step to understanding the scale of the potential Covid-19 fall out.

## **2. Literature Review**

The GFC acted to exacerbate the existing supply side issues that SMEs faced in debt and equity markets. Empirical studies of the GFC and its impact on SMEs (see for example, Fraser, 2009; Lee, Sameen, and Cowling, 2015) identified increased rejection rates for overdrafts and term loans, higher loan margins, and a particularly large decline in the supply of credit for higher risk firms without collateral. Further evidence highlighted increased rejection rates across a range of forms of credit (Fraser, 2009; Cowling and Liu, 2011). The number of credit rationed firms in the UK during a three month period in 2009 was estimated by Cowling and Liu (2011) as being 119,000 out of a total employing business population of 1.2m, with the main reason cited for attempting to access finance reported as working capital and cash-flow requirements. Hence, cash flow problems were the main reason for attempting to secure financial help. The capital market factors discussed above interact to determine the capital structures of SMEs with important implications for small firms' management of financial resources. Internal resources emerge as the most significant form of finance. This reliance upon internal financial resources can directly result in the undercapitalisation of small firms (Michaelas et al, 1998) and cause financial problems (Kotey, 1999), particularly in a crisis. As a direct implication of the financial characteristics of smaller firms in a crises, it follows that efficient financial management of internal resources is even more vital as they are particularly vulnerable to liquidity problems and are more exposed to external factors, such as changes within the macro economy induced by, in this case, a Global pandemic.

The management of working capital (i.e the management of current assets and current liabilities) typically focuses on the short term financial position of a business (Arnold, 2013), and is the key focus for a firms' internal financial management. This was identified as representing 'one of the most important challenges facing small to medium enterprises' (Mazzarol, 2014, p.2). A key element of this is the management of internal funds, particularly the surplus cash from profitable trading activity. This is where the focus of this research lies. We also take a longer view by considering how in the five years leading up to Covid-19 businesses retained, invested and distributed their internal funds. This gives us a more stable long-term perspective on how businesses manage their cash-flows and take a precautionary view on saving cash for a rainy day. But this relationship between precautionary saving and the management of working capital has a much broader and long-term theoretical basis which can be traced back to John Maynard Keynes in 1937 who identified two underlying reasons why a business might want to hold cash. Firstly, holding cash or highly liquid assets can reduce transactions costs as payments in cash or easily liquidated assets are lower cost than those that require realising cash from illiquid assets. Think about a business who wants to raise

some cash by re-mortgaging their premises. Here the bank would impose a fee for asset verification and valuation and there would be a cost of managerial time in applying incurred by the business. The second precautionary motivation for holding cash reserves is more central to our research here. The motivation behind this relates to holding cash reserves to insure (hedge) against the potential risk that future income streams are lower than expected. Bear in mind that we are only ten years on from the most harmful exogenous shock to the world in seventy-five years, what we now call the GFC, and one whose effects persisted for an uncommonly long period after the crisis unfolded in late September 2008. Yet the precautionary motive for businesses holding large cash reserves is not solely driven by future risk and uncertainty and the desire to protect against unfavourable circumstance. Even in a benign macroeconomic environment with no Covid-19 there is empirical evidence that businesses in industry sectors that are more volatile in terms of cash-flows and income variability hold more cash reserves on average than those in more stable industry sectors (Opler, Pinkowitz, Stulz and Williamson, 1999). However, it is the former that is of particular interest here as it influences the future ability of a business to cope with unanticipated and unfavourable events.

Here we draw support from Han and Qui (2007) who augmented consumer theories of precautionary saving and developed a model to explain corporate precautionary savings which drew on the core elements of consumer models of precautionary saving based on income smoothing over the life-cycle (see for example, Leland, 1978; Caballero, 1990; Skinner, 1988). Interestingly, elements of this augmented corporate model have re-appeared back in the consumer savings literature (e.g. Guerrieri and Lorenzoni, 2017). The Han and Qui (2007) study focused on identifying the relationship between cash holding, cash-flow uncertainty, and financial constraints. Whilst developed to explain large corporate behaviour, these relationships have greater traction when seeking to explain the behaviour of smaller businesses who, by their very nature, face more cash-flow uncertainty and financial constraints than their corporate counterparts. In this sense, focusing on cash holding as a means of protecting their businesses against unanticipated and adverse shocks is more interesting as the consequences of not doing so are more direct and immediate.

To sum up, if the objective of the business is to maximise the present value of future dividend payments to shareholders, or income stream to the entrepreneur in the case of smaller businesses who take money out of their businesses in a variety of ways depending on the taxation system, in the presence of future cash-flow uncertainty then the shareholders (owners) must also take into account the intertemporal trade-off between current investments and future investments. Importantly, financial constrained firms cannot make all the future investments that have a positive expected return without reducing the scale of current investment activity. In short, the business can only invest more in the future if it holds more cash and reduces its level of current investment.

Given the nature of the data available to us, we can explore the potential Covi-19 impact in the context of the theory of precautionary saving which suggests that older and larger business have less need to save as a precautionary motive as they have more stable cash-flows and face fewer constraints in external capital markets. These features of larger and older businesses also mean that future investment is also less dependent upon current savings. The flip side is that cash-retention is predicted to be more common in smaller and younger businesses to protect themselves against adverse future market conditions and to generate a cash pile that can ensure that future investments can be supported from internal funds rather than potentially being constrained in external capital markets. Of course, these predictions rely on the rational behaviour of small business owners a contention that has often been questioned in the entrepreneurship and small business finance literature in respect of the extent to which entrepreneurs fail to adjust their beliefs in the light of new information (Parker, 2006), excessive optimism regarding expected outcomes of investments (de Meza and Southey, 1996), and the compounding result that excessive optimists fail to insure themselves against potentially bad outcomes (Coelho and De Meza, 2012). Hence if we empirically observe that smaller business behaviours do not appear consistent with the theory of precautionary saving then we might argue that entrepreneurs and small business owners are behaving in a way that is more consistent with these strands of the entrepreneurial literature.

### **3. Data and Method**

This data used in this research was derived from a UK survey of the active business population conducted in 2018-2019 by IFF, one of the leading survey houses, with the specific aim of a better understanding of the main factors driving non-engagement or sub-optimal engagement with external capital markets. The survey purposely excluded businesses that had only begun trading over the last three years as they have different, and very pressing, concerns related to ensuring short-term survival and viability of the business. It was considered that these short-term issues would not allow us to explore the medium and longer-term issues around investment and financing that more well-established businesses could. In total 1,500 businesses were surveyed. To tackle any potential misalignments between the known actual UK business population and the achieved sample, we constructed a size class – industry weight that adjusted our sample to be representative of the business population on these combined metrics.

The specific survey question, which was only asked of businesses that had been trading for at least five years, that forms the basis of this research is:

**Qu: Over the past 5 years, which of the following uses has your business made of internal funds?**

*READ OUT. MULTICODE.*

Response category	Code	% Yes
<b>Distributed to shareholders / owners as dividends</b>	1	0.497
<b>Funded investment in the business</b>	2	0.687
<b>Purchasing financial investments (including mergers with and acquisitions of other companies)</b>	3	0.110
<b>Used to bolster business cash balances</b>	4	0.392
(DO NOT READ OUT, SINGLE CODE): <b>We have had no retained earnings/ internal funds</b>	5	0.086
(DO NOT READ OUT, SINGLE CODE): Don't know	6	0.139

The responses to this key question show immediately that 8.6% of smaller businesses have no internal cash at all. This suggests that one in every twelve businesses are at severe risk as they hold no cash balances at all. Empirical support for this is found in Brown, Linares-Zegorra, and Wilson (2019) who established that SMEs use credit cards as a form of improvised financial ‘bootstrapping’ to smooth out short-term liquidity problems. Nearly half of all businesses with internal cash distribute some of this to shareholders and owners as dividends, but only 11.0% used internal funds to purchase financial assets. Just under one in four businesses used internal funds to bolster their cash balances which we use as an indication of precautionary saving (building a bigger cash pile). This is at the heart of our research as we are explicitly connecting the Covid-19 crises with an economic meltdown due to the lockdown and restrictions imposed on business activity. Hence, businesses that have been saving cash in the lead up to the Covid-19 outbreak, we argue are best placed to weather the economic storm.

We have five particular variables of interest which are derived from the specific responses to the survey question asked of our business sample. These five variables are all in binary form and coded Yes=1 if the respondent indicated that they did make use of their internal funds in the specified way and No=0 if the respondent indicated that they did not use their internal funds in that way. The two that are of real interest are response (4) used internal funds to bolster cash balances, and (5) no retained earnings or internal funds. The former is our proxy measure to capture precautionary saving and the latter our proxy measure for businesses that are not generating surplus cash.

We estimate five separate probit models for each of the four specific uses of internal funds in the first instance. Then we estimate a model to distinguish between businesses

that had no internal funds and those who had some. In each case we seek to explain the variation in positive and negative responses by a small set of core demographic variables including (a) firm size class (micro, small, medium, and large) using the common employment definitions, (b) firm age class (5-9 years, 10-14 years, and 15+ years), and (c) industry sector (17 industry sector codes).

#### **4. Results**

From Table 1 we observe that the oldest age class of businesses, those that have been trading for more than fourteen years, are 9.8% less likely to distribute internal funds to shareholders and owners through dividends. However, we find no significant variation across firm size classes suggesting that micro business owners are equally likely to use internal cash for dividends as shareholders in much larger businesses. These findings are contrary to H1 regarding age and offer no support in respect of firm size. We do find huge variation across industry sectors. Of particular note are the high propensity for businesses in Financial Services, who are 39.5% more likely to pay dividends out of internal cash (than our reference group of Agriculture, Forestry and Fishing), Construction businesses (32.2% more likely to pay dividends) and Professional, Scientific and Technical Service businesses (31.5% more likely).

For using internal funds to fund investment, we only isolate one difference across size, age and industry sectors which suggests that the vast majority of all businesses in the UK prefer to fund their business investment from internal funds where possible. The one notable exception to this generalizable and important finding is for micro businesses who have a 13.8% lower probability of using internal funds for investment. This might imply that when investment opportunities do present themselves then the ability to access market finance is critical for this smallest size class of business. In the current economic climate this is potentially a significant problem. These findings are contrary to H2 regarding firm size and offer no support in respect of firm age. In regards to businesses using internal cash to fund invest in different financial assets, which represents a means of diversifying ones asset base and potential income streams, we find important size class differences, as well as an isolated industry sector effect. On size class, we find that micro businesses have a 17.5% lower propensity to invest in alternative financial asset classes and small businesses a 12.5% lower probability (compared to large firms). These findings are contrary to H3 regarding firm size and offer no support in respect of firm age. This suggests that the owners of the two smallest size classes of businesses are the least diversified in terms of investing in and holding other classes of asset and hence the most vulnerable to any exogenous factors negatively impacting on the business that they own. In addition, businesses in the Food and Accommodation sector of the economy are 12.9% less likely to invest internal funds in other financial assets.



Finally, we focus on what we regard to be the key responses in terms of the potential impacts of a protracted Covid-19 lockdown, using internal funds for precautionary savings and not having any internal funds at all. In both cases the single identifiable effect is for micro businesses. On uses internal funds to bolster cash balances (our proxy for precautionary saving), we find that micro businesses are 13.1% less likely to do this compared to other size classes of business. These findings are contrary to H4 regarding firm size and offer no support in respect of firm age. On having no internal cash or retained earnings to distribute, save, or invest, we find that micro businesses have an 8.6% higher probability of not having any internal funds at all. These findings imply that regardless of age and industry sector, micro businesses are at the most extreme risk levels given the potential for the Covid-19 lockdown to persist indefinitely as they have not been building up their cash reserves in the same way as other size classes of business over the last five years.

We conduct an additional check to see if there is cross equation correlation between the unobserved explanatory variables using a multivariate probit procedure. Essentially this type of model generates a test statistic for each pair of our four key equations for dividends, investment, financial assets, and precautionary saving. In total we have six pairs of equations. If we find that the relevant test statistic ( $\rho$ ) is equal to zero then this suggests that the outcome variable in the first equation is uncorrelated with the error term in the second equation. If  $\rho > 0$ , then the outcome variable in the first equation in the pair and the error term in the second equation in the pair is correlated and therefore endogenous. These tests are presented in Table 2. From this we observe that retained earnings for the purposes of investment and dividends is correlated, as are precautionary savings and dividends, and precautionary savings and investment. Diversification through investment in alternative financial assets is uncorrelated with other uses of retained earnings. We note that the key firm size effects retain their original significance, as does the age effect in the dividends model (Table 3).

## **5. Conclusions and Implications**

We set out to identify how the current Covid-19 crisis might impact on the ability of businesses to survive the economic pressures placed upon them by restricted trading conditions and the resultant decline in income streams. This we considered to be important as if there were a large enough share of the business population at risk of failure then this would represent a systemic risk to the stability of the economy and an existential risk to the lives and well-being of all those affected business owners. The mechanism through which we argued that this risk would impact upon businesses was through a liquidity crisis caused by a fall in sales on the one side and by not having a

large enough cash pile to manage ones way through the crisis. Using a recent survey of UK businesses to explore this issue and identify how many businesses are potentially at risk, our evidence is quite striking. One in twelve businesses approached the crisis with no spare cash holdings, and only four in ten had been saving for a rainy day over the last five years. This means that there is a significant share of the total business population in the UK that is at immediate risk (no cash holdings) or at medium-term risk (no evidence of building up cash reserves). Of particular concern is that micro businesses, the most dominant form of business in all economies, rich or poor, developed or undeveloped) were the most likely to be represented in both immediate and medium-term risk categories. Taken together, our empirical evidence is contrary to those predicted by the theory of precautionary saving for those businesses who face the dual issue of cash-flow uncertainty and restricted access to capital markets which leads us to conclude that micro businesses, those most in need of precautionary savings are behaving in a way that might exacerbate the negative consequences of a Black Swan event such as the current Covid-19 crisis.

Table 4 uses the actual UK business population figures as a basis for calculating the number of businesses in different size classes at immediate risk (no retained cash) and medium-term risk (not been bolstering their cash pile) to examine the potential consequences of a protracted lockdown and reduced trading environment. We note that the UK government has an 80% pay coverage scheme for furloughed workers which should reduce cash pressures for workers up to the median pay level and a number of lending and deferred loan schemes. With these policy responses in mind, we estimate that there are potentially 118,639 UK businesses at immediate risk of a liquidity crises if they cannot generate a revenue stream for a few months. If the Covid-19 lockdown extended into the medium-term (typically considered to be 12 months or more) then a large swathe of the UK business population becomes at risk as their cash piles dwindle over time. This is the doomsday scenario. The vast majority in both cases are micro businesses with 94,567 estimated to be at immediate risk and 720,876 in the protracted doomsday scenario. Our key findings suggest that if governments are concerned about ensuring that their respective business populations can emerge with as little damage as possible from the Covid-19 crisis, then the fundamental starting point would be to tackle this cash and liquidity crisis in their micro business populations. The policy response of the UK government has indeed focused on expanding the availability of capital to businesses through three specific interventions, (a) a £1.25 billion innovation loan fund to support business investment through match-funding investments; b) a business interruption loan designed for ordinary businesses; c) a bounce-back programme for working capital, but all interventions are loans which require capital and interest repayments, even if they are deferred for 12 months. Adding to the indebtedness of firms that are already cash poor means, in the best case scenario, that future investment will be deferred to pay back survival lending. Of course the innovation loan fund would be irrelevant for firms with no cash as they cannot provide matched funding.

Although our findings specifically relate to the UK, we believe that the issues around access to external capital markets and the way smaller business manage their internal

finances are common across advanced economies around the world (OECD, 2020). Hence, our results and concerns might have relevance for other countries. One final issue is the big question of should governments bail out businesses that have been engaging in specific behaviours that left them wide open to unanticipated risk, even though no-one could logically have foreseen the economic destruction caused by Covid-19? This is an important question for future research as it transcends the boundaries of economics, politics, and social welfare. That said, providing the right type of incentivisation is crucial to help SMEs adjust to the new realities they are confronting to enable them to remain solvent during a prolonged recessionary period. Often small amounts of grant funding can generate significant behavioural and strategic impacts for small companies to aid their revenue generating capabilities. Therefore, the government should consider offering small grants to SMEs who wish to undertake new activities such as the adoption of online sales. The scheme could offer fast turnaround grants of less than £5,000 to SMEs who wish to undertake new innovative business practices such as business model adaptation or other forms of product or process innovation to help increase revenue generation to ensure continuity of business in SMEs during the evolving crisis situation.

## References

- Arnold, G. (2013). *Corporate financial management*. (5<sup>th</sup> ed). Harlow: Pearson.
- Brown, R., Liñares-Zegarra, J., & Wilson, J. O. (2019). Sticking it on plastic: credit card finance and small and medium-sized enterprises in the UK. *Regional Studies*, 53(5), 630-643.
- Buckley, A. (2011). *Financial crisis: Causes, context and consequences*. Harlow: Financial Times Prentice Hall.
- Caballero, R. J. (1990). Consumption puzzles and precautionary savings. *Journal of monetary economics*, 25(1), 113-136.
- Coco, G. (2000). On the use of collateral. *Journal of Economic Surveys*, 14(2), 191-214.
- Coelho, M., & de Meza, D. (2012). Do bad risks know it? Experimental evidence on optimism and adverse selection. *Economics letters*, 114(2), 168-171.
- Cowling, M., & Matthews, C. (2018). *Internal financial management in smaller, entrepreneurial businesses*. Sage.
- Cowling, M. and Liu, W. (2011). *Business growth, access to finance, and performance outcomes in the recession*. Sheffield: Department for Business Innovation & Skills.
- Cressy, R. and Olofsson, C. (1997). European SME financing: an overview. *Small Business Economics*. Vol.9, No. 2, pp. 87-96.
- Meza, D. D., & Southey, C. (1996). The borrower's curse: optimism, finance and entrepreneurship. *The Economic Journal*, 106(435), 375-386.

- Fraser, S. (2009). *Small firms in the credit crisis: Evidence from the UK survey of SME finances*. Warwick: Warwick Business School.
- Guerrieri, V., & Lorenzoni, G. (2017). Credit crises, precautionary savings, and the liquidity trap. *The Quarterly Journal of Economics*, 132(3), 1427-1467.
- Han, S., & Qiu, J. (2007). Corporate precautionary cash holdings. *Journal of corporate finance*, 13(1), 43-57.
- Keynes, J. M. (1937). Alternative theories of the rate of interest. *The Economic Journal*, 47(186), 241-252.
- Kotey, B. (1999). Debt financing and factors internal to the business. *International Small Business Journal*. Vol. 17, No. 3, pp. 11-29.
- Lee, N., Sameen, H., & Cowling, M. (2015). Access to finance for innovative SMEs since the financial crisis. *Research policy*, 44(2), 370-380.
- Leland, H. E. (1978). Saving and uncertainty: The precautionary demand for saving. In *Uncertainty in Economics* (pp. 127-139). Academic Press.
- Mazzarol, T. (2014). Research review: a review of the latest research in the field of small business and entrepreneurship. *Small Enterprise Research*. Vol.21, No.1, pp2-13.
- Michaelas, N., Chittenden, F. and Poutziouris, P. (1998). A model of capital structure decision making in small firms. *Journal of Small Business and Enterprise Development*. Vol. 5, No. 3, pp. 246-260.
- Opler, T., Pinkowitz, L., Stulz, R., & Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of financial economics*, 52(1), 3-46.
- OECD (2020). Coronavirus (COVID-19): SME policy responses, <http://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-sme-policy-responses-04440101/>
- Parker, S. C. (2006). Learning about the unknown: How fast do entrepreneurs adjust their beliefs? *Journal of business venturing*, 21(1), 1-26.
- Skinner, J. (1988). Risky income, life cycle consumption, and precautionary savings. *Journal of monetary Economics*, 22(2), 237-255.
- Stiglitz, J. and Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*. Vol.71, No. 3, pp. 393-410.