

*Full Length Research Paper*

# Balance sheet channel in developing countries: Review, evaluation and integration

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**Lacking from most of the literature on the balance sheet channel is an integration of economic theory with empirical observation. We provide: (1) An account of the usefulness of the theoretical literature for interpreting the empirical research on the balance sheet channel; (2) Brief notes on some of the implications of the balance sheet channel; and (3) Suggestions for future research roadmap which integrates detailed empirical observation with relevant theory. Ultimately, this paper aims to evaluate what we can say with relative confidence about the balance sheet channel, given the evidence, and what we cannot say we have much confidence in at this point.**

**Key words:** Balance sheet channel, integration of economic theory.

## INTRODUCTION AND BACKGROUND

Credit supply and its distribution amongst firms of different sizes is becoming a burning issue in national economic debate. The debate has attracted not only economists but politicians and the public opinion at large, because of its important implications. The implication is that policy makers in both developing and developed countries are attaching an allocative role to the financial markets. In a hypothetical world, with no information asymmetries, the financial markets play no role in the distribution of credit because the allocation of credit is left to the interest rate. With information asymmetries prevalent globally especially in developing countries, the implication is that market imperfections are most likely to exist. It is the presence of imperfections in markets that results to financial panics, crises and crashes. Therefore, it is important to understand the functioning of the credit channel in developing economies.

Works on the balance sheet channel have attempted to answer the following questions: What happens to the supply and distribution of bank credits when an economy is faced by financial crisis and/ or restrictive monetary policy? What types of firms are affected the most in the distribution of bank finance? What is the

size of the balance sheet channel in these different financial systems? In developing countries, two additional questions have risen: What role does a balance sheet channel of monetary policy transmission have in abating financial crises and achieving MDGs? How do we improve credit distribution?

Lacking from most of the literature on the balance sheet channel is an integration of economic theory with empirical observation. This paper does not rectify that inadequacy. However, we provide: (1) An account of the usefulness of the theoretical literature for interpreting the empirical research on the balance sheet channel; (2) Brief notes on some of the implications of the balance sheet channel, and (3) Suggestions for future research roadmap which integrates detailed empirical observation with relevant theory. Ultimately, the contribution of the paper is to evaluate what we can say with relative confidence about the balance sheet channel, given the evidence, and what we cannot have much confidence in at this point.

## THE IMPLICATION OF A CORRECT BALANCE SHEET CHANNEL VIEW

A correct balance sheet channel provides four practical lessons for policy. Firstly, how to put financial sector to use to mitigate the impact of financial and economic

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crisis; The presence, repetition and severity of financial and economic crises means that Central banks could use the credit supply variable as monetary policy target. Simultaneously, policy makers need to consider the distributional effects of monetary policy if fairness and efficiency are to be the objectives of monetary policy. Hence, the need to know the channel and measurement of propagation of the balance sheet channel.

Secondly, how to deepen and broaden domestic resource mobilization and local financial systems in adverse global circumstances; a correct balance sheet view implies that, in periods of crises, policies aiming at restoring the momentum of credit supply should bear greater importance than policies aiming at stimulating credit demand.

Thirdly, how to harness financial system in order to achieve MDGs; for example, an improved supply and distribution of credit will improve access to credit by women. This will help achieve MDG number three which aims to promote gender equality and empower women.

Finally, this research lessons may be relevant to policy makers in countries where the banking system plays a more important role in credit allocation. It highlights why the International Monetary Fund and the World Bank have recently emphasized the importance of maintaining a healthy banking system.

### **DEFINING THE BALANCE SHEET CHANNEL**

The balance sheet asserts that monetary policy leads to changes in loan supply. It is a bank balance sheet asset side phenomenon. In this channel, monetary policy affects agency costs in bank lending, which leads to changes in bank loan supply. Monetary contractions reduce the net worth of borrowers (through reduced cash flows and asset prices). This is mostly applicable to small firms (Bernanke et al., 1996). Therefore in such circumstances, banks can reduce the amount of credit extended to small firms and invest more in safer alternatives (big firms) (Bernanke and Gertler, 1989). The implication of the balance sheet channel is that monetary policy changes lead to a reallocation of loan supply across firm types.

### **DISTINGUISHING THE BALANCE SHEET AND BANK LENDING CHANNELS**

A challenge faced by many researchers is distinguishing between the bank lending channel and the balance sheet channel. At face value, the two channels are similar in their macroeconomic implications (Black and Rosen, 2009) but differ in their functioning. In an effort to explain the bank lending channel, some researchers have involuntarily modelled the balance sheet channel. Researches related to the bank lending

channel have focused on identifying changes in aggregate loan supply. The bank lending channel predicts that banks reduce their aggregate supply of loans when monetary policy is tight. On the other side, papers related to the balance sheet channel have focused on identifying a redistribution of loan supply. The balance sheet channel predicts that banks reallocate their loan supply away from small firms and toward large firms when monetary policy is tight. However, many researchers have not attempted to separate the two channels. More specifically, the bank lending channel predicts the effect of monetary policy on the availability of credit. On the other hand, the balance sheet channel predicts the relationship between monetary policy and the distribution of credit.

### **ADVERSE SELECTION AND MORAL HAZARD IN FINANCIAL MARKETS**

Banks normally distribute credit in terms of quality. Adverse selection implies that lenders cannot distinguish high- risk from low-risk borrowers. This is due to the high cost of collecting information on the riskiness in financial markets. Therefore, lenders demand a risk premium above the risk-free rate of return on all their investments. Thus, the excess risk premium imposed on high quality borrowers offsets the losses incurred in funding high-risk borrowers. As a result, the highest quality borrowers may be priced out of the market.

The moral hazard problem concerns the situation when the agent (that is, debtor) received the credit amount from the lender (principal). An agent may have informational edge and associated incentives to use the resources in ways inconsistent with the principal's interests. Acting on such incentives, the agent may divert resources to risky activities, strip and loot assets, or simply run away with the money because the creditor may not have an effective way to monitor and prevent such behavior. Also, the moral hazard arises if there is symmetrically shared information where the principal faces high costs of enforcing the contract subscribed with the agent. Faced with moral hazard risk, a principal would try to find ways of arrange in a line the incentives of the agent with its own.

However, their prejudgements on quality of loans have been incorrect. What could have been a good project turns out to be ineffective. The quality of borrowers is private information (Stiglitz and Weiss, 1981), and hence cannot be perceived by banks. This asymmetry in information may induce banks to restrict or redistribute lending. Nevertheless, the existence of asymmetric information remains difficult to prove.

### **THE ROLE OF THE BANKING SECTOR IN THE BALANCE SHEET CHANNEL**

Banking institutions plays an important role in the allocation of credit. Banks operate under the general

guidelines of the Central Bank which is the monetary authority. Hence, the Central Bank's monetary policy affects the performance of banks (Fisher, 1980). Thus, bank balance sheets are an essential ingredient in the balance sheet channel. The banking institutions have to observe stipulated monetary policy guidelines in order to finance real economic activities. The response of the banking institutions to the guidelines determines the impact of the policies.

Bank balance sheets comprise of two equated counterparts: Assets and liabilities. Liabilities are sources of funds for banks. Liabilities include deposits, borrowings, for example, from the central bank, other banks and corporations. On the other hand, bank assets comprise reserves (both required and excess), deposits at other banks, securities and loans (credit).

For an economy to have a functioning balance sheet channel, the following questions should be answered positively. Do monetary policy guidelines affect or influence the performance of the commercial banks? Do the commercial banks indeed comply with the monetary and credit policy guidelines in administration of credit? If responses to the aforementioned questions are positive, then an economy is likely to have a well defined balance sheet channel. It is also important to note that the banking sector is most likely to be effective in economies where the financial structure of firms will be mostly 'bank-based'.

### **IMPLICATIONS: DEVELOPED VS DEVELOPING COUNTRIES**

The implications of the balance sheet channel seem to be different from a developing and developed countries perspective. One of the main observable features of credit markets in developing countries is the presence of segmented and well-defined formal and informal financial institutions. Evidence indicates that the structure of financial system in developing countries differs substantially from that in developed economies. In developing countries, formal credit markets often do not function well. The principal argument behind this assertion relates to asymmetric information between formal financiers and those who need financing may lead to adverse selection and moral hazard problem thereby making access to formal credit limited while the informal credit financial sector flourishes serving many clients. Research on credit markets in developing countries suggests that informal lenders are capable of taking advantage of information flows within remote areas based on their information set about credit worthiness of borrowers. The close proximity to the borrower affords informal lenders better information about repayment and usage of loan.

The connection between a country's stage of development and the structure of its financial system is now

common place in academic literature. Here, we argue that the balance sheet channel is operational and explains clearly developing countries cases. Firstly, in the early stages of development, banks play a predominant role in financing investment. As a country becomes more developed, it tends to have relatively larger and more liquid stock markets while the financial systems of less developed countries tend to be predominantly bank-based.

Secondly, there is a close connection between financial structure and the type of investment finance supplied by the financial system. Banks tend to specialize in debt finance, while stock markets provide equity finance. Both forms of finance are needed for private sector activity and the economy will prosper better when both forms of finance are available. Banks play a predominant role in supplying both short-term and long-term credit. By providing liquidity through short-term credit that can be used to finance working capital, banks allow businesses to release their own internal funds to finance fixed long-term capital.

### **SOURCES OF THE BALANCE SHEET CHANNEL**

Balance sheet channel forces can be attributed to a number of factors. These factors include high volume of non-performing-loans, ineffective judicial procedures for loan recovery, high intermediation costs (especially in developing countries), inadequate credit risk management systems, few adequately trained personnel, and non-transparent corporate governance practices.

Firstly, we note the liquidity spiral effect, which comes as a result of depressed economic developments. In this case, banks are more reluctant to provide additional loans to the weaker corporate sector. This is because they may be drawn into an endless cycle of loan loss provisioning. Therefore, for operational and profit maximization purposes, they change their credit distribution strategies.

Secondly, the impaired debt-servicing capacity of firms is also a crucial factor in credit distribution. Some financial institutions are risk adverse to lending to informational opaque firms because they do not have the skills needed to understand and evaluate these firms. In some banking institutions, the prevailing mindset is still one of 'bigger is better'. As a result, size is also a major consideration in credit distribution analysis.

Credit defaults also cause a mismatch in credit distributions. The default syndrome arises from, and is sustained by a lack of sufficient entrepreneurial skills in these borrowers and the inadequacies of the institutional infrastructure in enforcing contractual obligations. The former implies that the profit to be earned from business is low, while the latter ensures a light, if any, penalty for default. Lack of administrative, commercial, and legal institutions of many developing countries

provides an opportunity to people with sufficient political influence and within to defy the law without much fear of retribution. These people would attempt to borrow, as much as they could get away with, apparently for business investment. This poses the risk that the important task of allocating credit could become more political and less subject to rigorous economic analysis. Lastly, the balance sheet channel emanates from the macroeconomic uncertainty that increases. This is because the cross-bank dispersion of the share of risky loans to total assets diminishes since the uncertainty hinders bank ability to foresee investment opportunities. Thus, the uncertainty pushes banks to rebalance the composition of their assets in line with the new signals revealed by credit markets. This would adversely affect the allocation of financial resources.

Thirdly, the risk of falling in collateral values also affects credit distribution by banks. Bank loans are generally extended on the basis of the availability of collateral. As the bubble burst, the gaps between collateral values and the gross amounts of loans extended became a provisioning burden and drained away banks' capital. Fears of a repeat of these experiences make banks even more nervous in granting additional loans thereby reconsidering their distribution strategies.

Finally, the legal and regulatory framework existing in many countries also fails to provide the right support infrastructure to facilitate lending by the banking sector. The lack of protection for creditors and enforcement of collateral rights, lack of commercial dispute settlements and arbitration laws or onerous administrative procedures and even simply the lack of a consistent definition or enabling law for classifying firms are some of the impediments to financing.

## A GENERAL SIMULATION OF THE BALANCE SHEET CHANNEL

The effect of the balance sheet channel is that banks reallocate loan supply from small firms to large firms during periods of tight monetary policy. Small firms tend to be riskier than large firms due to less diversification and, often, a riskier balance sheet. The balance sheet channel predicts that a reduction in net worth among firms due to a monetary contraction causes the risk of small firms to increase more than the risk of large firms, thereby causing banks to shift their loan supply from small firms to large firms.

We modify the basic corporate finance model. We shall simulate an economy with a finite number of firms denoted by  $N$ . We shall represent the bank credit supply ( $L^s$ ) as a function of monetary policy stance ( $M^p$ ) (Pruteanu-Podpiera, 2007) and a set of firm characteristics ( $F^c$ ). The function can be presented as follows:

$$L_{Nt}^s = f(M_t^p; F_{Nt}^c) \quad (1)$$

To test for the distribution effect of credit, we shall test for the elasticity of supply amongst different firm sizes. The firms are classified into two types: Small firms denoted by  $i$  and large firms denoted by  $j$ .

We shall simulate the elasticity of credit supply for small firms as a derivative of credit supply with respect to firm characteristics whilst controlling for monetary policy stance. Thus, we modify Equation (1) as follows:

$$\frac{\delta L^s}{\delta F_i^c} = \alpha_0 M^p + \alpha_1 F_i^c \quad (2)$$

We shall simulate the elasticity of large firms as follows:

$$\frac{\delta L^s}{\delta F_j^c} = \phi_0 M^p + \phi_1 F_j^c \quad (3)$$

If the Balance sheet channel is true, we expect that in periods of monetary policy restriction, the elasticity of credit supply is elastic for large firms and inelastic for small firms. Therefore, the condition for small firms will be:

$$0 < \frac{\delta L^s}{\delta F_i^c} < 1 \quad (4)$$

and for large firms the condition will be:

$$\frac{\delta L^s}{\delta F_j^c} > 1 \quad (5)$$

It is important to stress that condition (4) and (5) should occur simultaneously for us to have a true balance sheet channel.

## DEBATES IN LITERATURE

The credibility of the balance sheet channel has remained ambiguous for various reasons. These range from the origin of the work, methodology, to data issues. Empirical literature has produced mixed results at country level. Different methodologies have been used but the results have been inconclusive. Type of data used has been a major problem. Some empirical tests have been based on aggregate time series analysis and some on firm level panel data (disaggregate microeconomic approach).

## **MEASURING THE BALANCE SHEET CHANNEL USING PROXIES**

Researchers have been confronted by issues that concern the unavailability of data, particularly in developing countries. Data on the actual variables suggested by the theoretical models of the balance sheet channel is scarce. This means that some of the variables either have to be excluded in the empirical model. For some variables proxies have to be found. However, the risk involved in finding proxies is that they may not correctly represent the impact of the actual variables. This is a serious challenge to most empirical studies on the balance sheet channel. However, this problem seems not to have significantly affected the findings presented in this study, since they corroborate both the theoretical and empirical knowledge.

## **DISAGGREGATE DATA AND THE BALANCE SHEET CHANNEL**

Researchers have used firm-level data to show a reallocation of credit (Gertler and Gilchrist, 1993; Oliner and Rudebusch, 1996; Kanoh and Pumpaisanchai, 2006; Ciccarelli et al., 2010; Albertazzi and Marchetti, 2010). This strategy specifies loan supply to each firm as a function of firm specific characteristics such as collateral. These studies produced excellent econometric models for the developed world. One of the advantages of using firm data, instead of aggregated data, is that it allows investigating distinct behaviour among different types of firms. However, firm level data modelling is of little usefulness in the context of developing countries. In these countries, there is a large informal sector for which financial data is limited. Therefore firms do not disclose the rich data needed for empirically testing a feasible balance sheet channel. Also, in transition developing countries, even the listed or large non-listed firms' financial statements are not as reliable as those in developed countries. In these models, there may be a problem of oversampling of large firms because they are more formalized and have organized data.

## **AGGREGATE DATA AND THE BALANCE SHEET CHANNEL**

Modelling the balance sheet with aggregate data has also been popularized in a number of research works (Blundel-Wignall and Gizycki, 1992; Pazarbasioglu, 1996). This strategy usually involves examining the response of aggregate loans, aggregated stock market data to monetary policy shocks. Aggregate measures do not provide the much needed information about the balance sheet channel. For example, these measures do not provide the distribution of financing among firms of different sizes, which is the core factor for testing

the presence of the channel. In a well-developed financial system, the distribution of data is likely to be biased towards small firms. In developing and transitional financial systems, the distribution of data is likely to be biased towards large firms who have the resources to access the financial markets. The implications of the balance sheet channel are distributional, which means that monetary policy will have different effects across firms. Thus, these effects cannot be argued with aggregate data.

There is a set of literature that focuses on the effect of shocks such as financial crises, crashes and panics on the supply and distribution of credit; notably, Peek and Rosengren (2000) (Japanese crises) and Chava and Purnanandam (2010) (Russian crises) (1998). A shift of bank loan supply by contrast may occur if banks' ability and willingness to extend loans are affected by the financial crisis. In the wake of Taiwan's financial crisis, local banks lost capital due to loan losses and asset price slumps. Since banks are required to maintain their capital ratios in line with Basle standards, those capital-impaired banks are not in a position to extend more credit: (1) Banks may also become more selective, by raising the collateral requirement or imposing more stringent non-interest rate credit rationing, when the actual and perceived riskiness of borrowers' credit-worthiness worsens due to weakness in borrowers' balance sheets. This supply side effect is particularly damaging to bank-dependent firms, because it is difficult for these firms to replace bank credit with other sources of funds. (2) Correctly identifying the cause of declines in bank credits has important implications for policy makers. For example, if the credit decline is on account of weak demand, then economic policies that aim at stimulating aggregate demand may be effective. If, on the other hand, the decline is because banks are capital-constrained or are reluctant to lend due to increased riskiness, then an easy monetary policy would simply raise excess reserves held by banks, and has little effect on raising bank lending and investment.

## **METHODOLOGIES ISSUES**

A number of researches have focussed on diverse econometric methodologies in addressing the same research problem. Economists have used econometric methodologies or techniques mostly tailored or suitable for closed economy (especially US) models. Given most developing countries are small open economies, subjected to enormous external shocks, closed economy models are insufficient in uncovering the balance sheet channel.

## **DISTINGUISHING BETWEEN SMALL AND LARGE FIRMS**

Modelling a correct balance sheet channel requires a

thorough study of the behaviour of alternative groupings of firms. That is, small and large firms. This is a common practice in literature. It has also become common practice for firms to distinguish small and large firms in terms of multinational and domestic firms, and firms which are more and less dependent on external finance. Another classification which has not been explored by literature is that of 'new firms versus old firms'. The division into subgroups have been based on criteria that are correlated to investment or to cash flow.

One of the most abused proxy for firm size is the loan size. Larger loans tend to correspond to larger firms. This proxy has allowed researchers to discuss differences in the effect of monetary policy across firm sizes. For example, separating loan size into two categorical variables: "Small Firm" is a loan with a size of R100,000 or less, and "Large Firm" is a loan with a size greater than R100 000.

In developing countries, balance sheet data is skewed towards non-urban regions. Thus it does not represent the overall business conditions of the economy. For example, the primary source of financing for small firms is from family, friends, and personal credit cards. This means an easing of credit availability may not have an effect on small firms, which are the real sources of economic growth.

## CONCLUSIONS

The size of the banking sector is an important determinant of the strength of the balance sheet channel in an economy. With a small banking sector, we will expect the redistribution of the loan supply to be more volatile than in an economy with a large banking sector. Despite the modeling and challenges we have discussed previously, other thing being constant, we would expect the balance sheet channel to be clearer in developing and transitional economies than in developed countries. The problem of information asymmetries which lead to moral hazard and adverse selection is highly associated with undeveloped markets which characterize these markets.

Another critical observation we make is that in most studies of the balance sheet channel in open economies is the lack of a 'world component', which explains most of the variations of the channel in the countries studied. The studies have no reference in the text or in the model to possible external impacts on the balance sheet channel. Given that most economies are now classified as open economy, the absence of an external influence renders the results of questionable value. When modelling the balance sheet channel, most researchers notes the exclusion of 'international developments on the local economy'. We view this as a major drawback.

In designing the best strategies for fostering financial development, policymakers should deal with the issue

of financial structure. An optimal mix between a bank-based or stock market-based financial system is essential if an economy is to reap and/or have a functioning balance sheet channel. However, it is important for a country to find a mix that is most appropriate to their national objectives and their specific economic environment. Nonetheless, we suggest one good reason for why developing and emerging countries will benefit from engaging a bank -based system over stock market development. For developing countries, pursuing stock market development is a costly exercise which is accompanied by many risks and uncertainties.

We also noted that the impact of credit distribution has been misevaluated because of sectoral and location factors. Many banks are biased towards extending loans to the service and manufacturing sectors. In developing economies, it is clearly evident that the agricultural sector has been immensely marginalized with regard to credit allocation biased towards urban areas, especially in developing countries, where there is low population and agricultural activity. Given that agriculture in developing countries is to a large extent a rural phenomenon and that the sector employs a larger percent of the labor force, it is important that policy makers identify these imbalances if the balance sheet channel is to provide maximum benefits to the real economy

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