Interaction of formal and informal financial markets in quasi-emerging market economies

Harold Ngalawa [a,*], Nicola Viegi [b]

[a] University of KwaZulu-Natal, School of Accounting, Economics & Finance, Westville campus, Durban, South Africa
[b] University of Pretoria, School of Economics, Lynnwood Road, Pretoria 0002, South Africa

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ABSTRACT

The primary objective of this paper is to investigate the interaction of formal and informal financial markets and their impact on economic activity in quasi-emerging market economies. Using a four-sector dynamic stochastic general equilibrium model with asymmetric information in the formal financial sector, we come up with three fundamental findings. First, we demonstrate that formal and informal financial sector loans are complementary in the aggregate, suggesting that an increase in the use of formal financial sector credit creates additional productive capacity that requires more informal financial sector credit to maintain equilibrium. Second, it is shown that interest rates in the formal and informal financial sectors do not always change together in the same direction. We demonstrate that in some instances, interest rates in the two sectors change in diametrically opposed directions with the implication that the informal financial sector may frustrate monetary policy, the extent of which depends on the size of the informal financial sector. Thus, the larger the size of the informal financial sector the lower the likely impact of monetary policy on economic activity. Third, the model shows that the risk factor (probability of success) for both high and low risk borrowers plays an important role in determining the magnitude by which macroeconomic indicators respond to shocks.

1. Introduction

For many years, informal financial markets have been perceived as an economic ill that has only succeeded in exploiting impoverished peasants in quasi-emerging market economies (QEMEs) (Bolnick, 1992).[1] The policy prescription, as expected, has been to integrate the informal financial sector (IFS) in the formal financial sector (FFS) (see Aryeetey, 2008; Bell, 1990; Bolnick, 1992). Recent research, however, has shown an emerging change in opinion with the sector now being regarded more positively as an integral component of the whole financial sector. Chipeta and Mkandawire (1991), for instance, report that the IFS in Malawi plays an important role in alleviating economic hardships among low-income groups by enabling these groups to mobilise resources (savings effect), use the resources to earn income (investment effect) and obtain loans (credit effect). An account of similar findings is presented by Steel et al. (1997) in a study of Ghana, Malawi, Nigeria and Tanzania. Steel et al. (1997) stress that informal financial institutions (IFIs) in the three countries are an important vehicle for mobilising household savings and

financing small businesses, a function that is carried out using specialized techniques that address the problems of information, transaction costs, and risks, which prevent banks from serving these market segments. In Kenya, Atieno (2001) observes that unlike commercial banks, informal credit sources provide easier access to credit facilities for small and micro-enterprises.

The co-existence of the FFS with a large IFS is one of the fundamental distinguishing features of QEMEs. Several studies have shown that the IFS in QEMEs is large (see for example African Development Bank, 1994; Chipeta and Mkandawire, 1991) and growing (see for example Aryeetey, 1994; Bagachwa, 1995; Chipeta, 1998; Chipeta and Mkandawire, 1991; Soyibo, 1997). According to the African Development Bank (1994), 70% of the total population in Cameroon and 80% in Zambia take part in informal financial activities. The African Development Bank (1994) also reveals that 85% of rural households in Niger and over 80% of smallholder farmers in Zimbabwe have access to informal credit, and 60% of the population in Ethiopia and 52% in Senegal participate in rotating savings and credit associations (ROSCAs). In Malawi, Chipeta and Mkandawire (1991) observed that in 1989, the IFS was larger than the FFS when measured in terms of credit extended to the private sector. They arrived at the same result by comparing savings mobilised by the formal and informal financial sectors. Field surveys carried out in Nigeria by Soyibo (1997), in Ghana by Aryeetey (1994), in Malawi by Chipeta and Mkandawire (1991) and in Tanzania by Bagachwa

* Corresponding author.
   E-mail addresses: ngalawa@ukzn.ac.za, hngalawa@yahoo.co.uk (H. Ngalawa), nicola.viegi@up.ac.za (N. Viegi).

[1] We define QEMEs as low income countries characterised by weak monetary and fiscal institutions and a formal financial sector that co-exists with a large informal financial sector.

(1995) established that the IFS grew faster than the FFS in the reform years 1990–1992 (Chipeta, 1998).

Given its sheer size, the IFS's response to monetary policy is expected to be non-trivial and the consequent effect on the economy may not be obvious—it is likely to vary depending on whether informal financial markets are autonomous or reactive to activities in the formal financial markets (see Acharya and Madhura, 1983; Rahman, 1992; Sundaram and Pandit, 1984); whether the two markets are competitive or complementary; and whether the nature of their interaction frustrates or strengthens monetary policy. Unfortunately, nearly all QEMEs leave out informal financial transactions in official monetary data, effectively underestimating the volume of financial transactions and bringing into question the timing and effect of monetary policy on economic activity. This paper contributes to the literature by investigating these and other issues. Using a four-sector macromonetary model with microeconomic foundations, we study the interaction of formal and informal financial markets and analyse the resulting impact on economic activity in QEMEs.

The term informal finance is used in this study to refer to legal but unregulated financial activities that take place outside official financial institutions, and are not directly amenable to control by key monetary and financial policy instruments. Encompassed in this definition is the mobilisation and lending of financial resources by friends, relatives, neighbours, grocers, local merchants/traders, landlords, tenants, grain millers, moneylenders, non-rotating savings and credit associations (SCAs), rotating savings and credit associations (ROSCAs), cooperative and savings associations (CSAs), and microfinance institutions, among others.

The IFS is known for its fragmentation into sub-sectors. The village merchant, for instance, may agree to lend money only to those who buy regularly from his shop; a landlord may also give credit only to those who work for him; while friends, relatives and neighbours may only lend to each other. Effectively, the credit market is broken up into small 'credit islands' (Basu, 1997). There is no reason, however, to believe that these sub-markets are mutually exclusive. The market segments are likely to have interlocking spaces serving clients in more than one sub-market, making the concept of market fragmentation complex. For simplicity, the IFS is assumed to be one large market where interest rates may be different but generally change together in the same direction.

The choice of a dynamic stochastic general equilibrium (DSGE) framework for analysis is motivated by a number of factors. First, DSGE models are derived from microeconomic foundations of constrained decision-making. That is, they describe the general equilibrium allocations and prices in the economy where all agents dynamically maximise their objectives subject to budget or resource constraints (Tovar, 2008). Following the estimation of deep parameters, therefore, it is possible to avoid the Lucas Critique, where only models in which the parameters that do not vary with policy interventions are suited to evaluate the impact of policy change (Tovar, 2008). Indeed, according to Woodford (2003), DSGE models should not, at least in principle, be vulnerable to the Lucas Critique, unlike the more traditional macroeconomic forecasting models. Second, DSGE models are structural, implying that each equation has an economic interpretation which allows clear identification of policy interventions and their transmission mechanisms (Peiris and Saxegaard, 2007). Third, DSGE models are forward looking in the sense that agents optimise model-consistent forecasts about the future evolution of the economy (Peiris and Saxegaard, 2007). Fourth, DSGE models allow for a precise and an unambiguous examination of random disturbances. This is facilitated by the stochastic design of the models. To the best of our knowledge, there is no study that has examined the interaction of formal and informal financial sectors and their impact on economic activity in QEMEs using a macromonetary model developed within the context of a microfounded DSGE representation.

Following this introduction, the rest of the paper is structured as follows. A DSGE model for QEMEs is developed in Section 2. The model aims at building a quantitative macroeconomic representation from explicit optimising behaviour while allowing for a minimum amount possible of imperfections. Thus, the model is similar in many aspects to the Real Business Cycle approach except on the monetary side (see Mankiw, 2006; Tovar, 2008). Calibrations of parameter and steady state values are presented in Section 3. Section 4 interprets simulation results of the model from three experiments, each illustrating impulse responses of selected macroeconomic indicators to a particular shock. The three shocks in the experiments include a positive production technology shock, a monetary policy shock and a risk factor shock. A summary and conclusions are presented in Section 5.

2. A DSGE model for QEMEs

2.1. Basic design

There are four sectors in the economy: households, firms, financial intermediaries and monetary authorities. The household maximises an intertemporal utility function separable in consumption, leisure, and real cash balances; and its financial resources are used for consumption or held as cash balances with the excess deposited in commercial banks or lent out to firms in the informal credit market. The financial system is segmented into formal and informal financial sectors. We generalise service providers in the FFS as commercial banks and in the IFS as moneylenders. While commercial banks are corporate institutions, moneylenders are usually individuals, each person operating as a business unit. In rare cases, moneylenders have been observed to hire agents (Bolnick, 1992).

Besides the fact that the business is run by individual persons, moneylending usually has no formal accounts and is often run without official registration. It is, therefore, difficult to isolate moneylending from the household as a completely separate institution. Accordingly, we consolidate the household and moneylending activities and assume that the behaviour of moneylenders is described within the household's utility maximisation problem. Nonetheless, we allow the moneylending function to operate distinctly within the household framework. We describe the household's credit function as 'moneylending' and we reserve the term 'moneylenders' for credit institutions in the IFS. Thus, the term 'moneylenders' is used as a blanket reference to all creditors in the IFS, including the moneylenders themselves, traders, landlords, estate owners and grain millers, among others, rather than as a reference to the usury market only.

The firm produces its own capital by converting loans obtained from the formal or informal financial sectors, which are assumed to be perfect substitutes (see Dasgupta, 2004). Using capital and labour as the only factors of production, the firm produces final output using technology described by a Cobb–Douglas production function. In the financial market, firms self-selectively seek loans either in the formal or informal credit markets. While lenders in the IFS deal with local communities for which they are able to identify risk levels of individual potential borrowers, the same does not apply to commercial banks in the FFS. Commercial banks are unable to distinguish between high and low risk borrowers ex-ante because high risk borrowers disguise themselves as low risk borrowers in order to enhance their chances of obtaining credit in the FFS. We assume that the commercial banks have a preference for low risk borrowers emanating from the view that low risk borrowers are associated with a relatively higher rate of loan repayment, which translates into higher expected profits for the banks than is the case with high risk borrowers. At this point, we invoke the Stiglitz and Weiss (1981) hypothesis that banks may ration credit in equilibrium.

The residual demand that is rationed out of the formal loan market spills over to the informal credit market. Accordingly, the IFS provides credit to this demand as well as the component of total credit demand which self selectively seeks loans in the IFS only. Finally, we assume that the population is constant so there is no aggregation bias with