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Liberalization, bankers' motivation and productivity: A simple model with an application

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ABSTRACT

Proponents of financial liberalization argue that deregulation motivates bankers to increase their effort and operate at a higher level of efficiency and productivity. Sceptics, however, see that liberalization engenders economic instability and banking crises, and impedes growth. Bank efficiency and productivity, following liberalization, is extensively examined. Nonetheless, the core issue of bankers' self-motivation remains implicitly assumed and unaddressed. Does liberalization self-motivate bankers and increase their efforts and productivity? This paper models bank productivity from this perspective and evaluates what proportion of banks' total factor productivity is accounted for by the self-motivated productivity of bankers. We provide a micro-founded framework for the analyses of bankers' optimal level of effort and effort-driven productivity. Our model also captures banks' unit input-output prices, optimal wages, bank spread and the overall cost of bank services – measures that are important in evaluating reform policies. We assess the financial liberalization of Nepal as a test case and find that (i) bankers' efforts and productivity have notably improved in Nepal, although banking services have become costly, and (ii) bank spread has moderately declined in recent years. Our approach is parametric which differs from DEA, hence complements the literature. We hope this analytical framework will be useful to evaluate reform episodes elsewhere.

1. Introduction

The world has seen sustained financial liberalization, increasing privatization and gradual loosening of capital controls since the mid-1990s. The economic thinking behind all this is that the financial entities, functioning under liberalized financial regimes, operate at higher levels of efficiency and productivity. Productivity improvements may ensue from different sources yet the notion that the private – i.e. the individual institution's – motive to maximize profit leads to productivity improvement is one of the fundamental ones. Put differently, a deregulated financial system is viewed as motivating institutions (in this instance banks) for higher levels of effort, productivity and profitability. Further, liberalization and deregulation is advocated to create a more integrated and competitive banking sector ensuring efficient allocation of bank credits to productive sectors.

These assertions, made in favour of liberalization and deregulation, have not gone unchallenged however. For example, Dell'Ariccia and Marquez (2004), analysing the effect of foreign entry on credit reallocation following liberalization, show that the entry of fiercely competitive foreign banks may push local banks' lending portfolio towards low quality and high risk local borrowers. In their model the degree of information asymmetry affects bank credit allocation; and, liberalization is shown to result in credit market segmentations between foreign and domestic banks – an outcome certainly against the intended motives of deregulation. Likewise, Gehrig (1998), analysing cartelized banks, shows that financial market integration – especially in countries with a lower degree of credit market fragmentation, e.g., Europe – could worsen aggregate loan quality and increase systemic risks, which aggravate aggregate risk and poor credit allocation. Outcomes for emerging countries, where credit market fragmentation could be high, are likely to be positive however. In short, at the theoretical level, doubts have been raised on the potential benefits

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advocated by the proponents of banking liberalization and deregulation.

Empirically, the effects of financial liberalization and bank deregulation have been researched quite extensively on various fronts: growth, productivity and bank efficiency. For example, Bekaert et al. (2005), Mishkin (2008), Levchenko et al. (2009), Belke et al. (2016), to name but a few, report that the effects of financial liberalization on financial depth and economic growth have largely been positive. In contrast, Diaz-Alejandro (1985), Kaminsky and Reinhart (1999), Demirguc-Kunt and Detragiache (1999), Kose et al. (2003), Ahmed (2013), among others, report that liberalization has contributed to economic instability, banking crisis and stalled growth. However, Hamdi and Jlassi (2014), analysing 58 developing countries, do not find evidence of liberalization contributing to economic instability and banking crisis. In a nutshell, empirical evidence on the effects of financial liberalization on growth, economic stability and banking crises is rather mixed.

A strand of literature (Fare et al., 1994; Humphrey and Pulley, 1997; Wheelock and Wilson, 1999; Tirtiroglu et al., 2005; Pasiouras, 2008; Brissimis et al., 2009; Delis et al., 2011; to name but a few) examines bank efficiency and productivity following reforms and regulatory changes. They are panel as well as country-specific studies which mostly employ non-parametric data envelopment analysis (DEA) to compute various efficiency decompositions – technical efficiency, scale efficiency, efficiency change (catching up or falling behind) – and productivity growth.[2] This is an extremely rich body of literature conducting rigorous empirical analyses and offering evidence if deregulations and reforms have worked, i.e. if reforms had a positive effect on banking efficiency and productivity. Again, the overall evidence is mixed: bank efficiency and productivity have improved following deregulation in some countries but not in others.

One common theme (implicit assumption) across all empirical studies (cited above) – as well as the premise of financial liberalization – is that, following liberalization, financial institutions (banks) become self-motivated to improve their productivity and profitability. The anticipation is that reforms and liberalization avail opportunities to optimize, and bankers react by increasing their efforts and productivity. However, to the best of our knowledge, the literature, so far, does not grapple with the issues of bankers' self-motivated efforts following liberalization. Do bankers react by increasing their effort following liberalization? Does their self-motivated effort lead to increase in banking sector productivity? The effects of financial deregulation on bankers' motivation, banking sector productivity and the cost of bank services (unit price of bank output) are important policy issues.

This paper aims to contribute to the literature by analysing, among other things, bankers' optimal efforts (self-motivated incentive) and effort-driven productivity following deregulations and reforms. Our objectives are twofold. First, we develop a theoretical model of bankers' optimal level of effort and effort-driven productivity applicable under a liberalized environment; it is hoped that our model serves as a simple yet general framework for assessing such issues. Second, as a test case, we implement (estimate and simulate) our proposed model to assess the effects of financial liberalization in Nepal.

Our contribution to the literature is that our approach differs from DEA. We model banks as profit-cum-utility maximizing firms. We directly model bankers' optimal level of productivity rather than relative productivity, as is done under DEA. A conceptual clarity is worth emphasizing. Throughout the paper, we use bankers' incentive or motivation in the sense of bankers' self-motivated response (efforts) to optimize productivity and profitability following liberalization. This is precisely the raison d'être of financial liberalization and reforms. We do not imply incentive in the sense of bankers' compensation packages.

[2] Some of these studies subsequently employ parametric methods to model the productivity and efficiency measures computed through DEA.

The literature outside of the banking area documents that reforms-led private incentive (effort) is key in enhancing productivity and growth. McMillan et al. (1989) examine the case of Chinese agricultural reforms that replaced "communal decision making" by the "responsibility system" which incentivized (rewarded) individual farmers. The Chinese agriculture sector grew by 61% between 1978 and 1984 and McMillan et al. (1989) attribute 78% of productivity gains to the strengthened individual incentives following reforms; they state "rewarding individual effort yields large benefit" (McMillan et al., 1989, p. 783). In this context, a related and pertinent question would be to ask if financial liberalization and banking deregulation motivate bankers to increase their efforts and productivity accordingly. We model bankers' efforts and effort-driven productivity in the spirit of McMillan et al. (1989). We focus on three fundamental issues: (i) whether bankers have become self-motivated and increased their levels of effort in augmenting banking sector productivity, (ii) whether banking sector productivity has increased, and (iii) what has been the impact of liberalization on bank spread (the difference between banks' input and output unit prices) and the overall cost of banking services.

Our theoretical model combines banks' production technology with their optimizing behaviour. Banks' technical production function is that of the Cobb-Douglas technology which is standard in the literature (Clark, 1984, 1988; Humphrey, 1991). We augment banks' technical production function by effort and risk parameters. We derive banks' optimal feasible production function, which embeds banks' profit-cum-utility maximizing optimal levels of effort following liberalization. In this setup, banking sector productivity becomes endogenous to bankers' optimal level of effort, relative input-output prices and some technical and risk parameters.

As a test case, we use our model to scrutinize Nepalese financial liberalization and reforms by employing cutting-edge econometric methods, calibrations and simulations. Nepal is one of the least developed and poorest countries of the world which went through deep financial sector reform from 1992 to 1994. However, due to Maoists' armed insurgency (People's War) starting in 1996, economic and financial activities were largely dormant until Maoists entered into dialogue for peace in 2000. Financial activities soared post-2000 exploiting the liberal regime and ushering fundamental changes into the country's financial sector (see Section 3). This makes the Nepalese banking sector an interesting test case as to whether financial reforms have produced anticipated productivity improvements.

We find that bankers' optimal level of effort, optimal bank productivity and bank profitability have considerably improved in Nepal following financial liberalization. Formal tests show that bankers' efforts significantly explain bank productivity. We also find that in recent years the bank spread has slightly reduced, indicating competitive pressure, yet banking services have become more costly (higher unit price of bank output). On the whole, financial reforms and liberalization appear to have been a fruitful experience in Nepal.

The rest of the paper is organized as follows. We present our analytical model in the following section; Section 3 briefly outlines the financial regimes of Nepal and argues why Nepal is an interesting test case; econometric specification and data are discussed in Section 4; empirical methodologies are discussed in Section 5; empirical results are presented in Section 6; calibrations and simulation of optimal effort and productivity are discussed in Section 7; and Section 8 concludes the paper.

2. Model

Financial liberalization, among other things, frees prices. Interest (deposit and lending) rates, bankers' wages, CEOs' pay and other incentives, such as bonuses, are competitively determined but there are always entry and exit restrictions in the banking industry. These restrictions are maintained by the Central Bank which may be motivated by its concerns over financial fragility and/or some notional