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REGULAR PAPER

Financial development, economic growth and millennium development goals in South Africa

Is there a link?

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Emilie Chanceline Kinfack
Independent Consultant, Pretoria, South Africa

Abstract

Purpose – The purpose of this paper is to empirically report the findings on the relationship between financial sector development, economic growth and of millennium development goals (MDGs) for poverty reduction, education and health development in South Africa.

Design/methodology/approach – The autoregressive distributed lag bounds testing technique was applied to two indicators of financial development, economic growth and four indicators of MDGs.

Findings – Economic growth and MDGs jointly cause financial development. Similarly, economic growth and financial sector development jointly cause the attainment of MDGs. The attainment of MDGs such as increased per capita expenditure on food and education as well as economic growth jointly cause financial development.

Practical implications – The findings highlight the complexity of the relationship between financial development, economic growth and MDGs. It is essential that the government of South Africa pursue a three track strategy of promoting financial sector development, economic growth and MDGs. The development of one strategy causes and is caused by the development of the other two.

Originality/value – Relationships between financial development, economic growth and MDG targets are unsettled in the literature. This paper studies the link between the three variables in South Africa. Hence, the contribution of this study is to enrich the understanding of this important field in the context of an important African country.

Keywords Developing countries, Poverty, Sustainable development, Social policy, Social welfare, Economic philosophy/theory

Paper type Research paper

1. Introduction

The link between the development of the financial sector, a country’s economic growth and the achievement of millennium development goals (MDGs) is an under-studied topic. This is quite surprising as achieving MDGs of eradicating extreme poverty is on African governments’ development agenda. The Millennium Declaration created eight MDGs for nations to meet by 2015. They are targets to reduce poverty while promoting education, gender equality, health, environmental stability and global partnership (see Figure 1). The new partnership for Africa’s development (NEPAD) adopted MDGs as the centrepiece of the African development agenda.

MDGs are all inter-related. As one goal is achieved, progress towards another is advanced as well. For example, access to safe drinking water impacts positively upon health-related outcomes. Similarly, the attainment of universal primary education would ensure greater gender equality as girls are enrolled in school. MDGs are linked to
sustainable economic growth in that they are: “ends in themselves” and “capital inputs” (Sachs, 2005). By the MDGs being ends in themselves, they have the capability to launch the people to better and improved standards of living; whereas as capital inputs, they contribute to productivity and ultimately sustainable economic growth.

The literature identifies five links between MDGs, economic growth and capital accumulation (Sachs, 2005). The first and second links relate to human capital and infrastructure development which are achieved through MDGs targeting poverty and disease reduction, clean water provision and sanitation and proper housing, respectively. The third has to do with knowledge capital, and is harnessed from MDG8 that seeks technological innovation and diffusion. The fourth link has to do with increases in household income which is to be realised through MDG1 for reduction in income poverty. The last link relates to the development of natural capital. It concerns the aspect of environmental and ecological sustainability through maintaining a country’s stocks of wild flora and fauna. It would therefore appear that meeting the goals for hunger, education, gender equality and health is vital for overall economic growth and development (Sachs, 2005).

Economic growth is a complex problem because several factors contribute to the sustainability once it starts. Its desirability is highlighted by the fact that it is being earnestly sought by every country, on a sustainable basis, as an important channel for improving their living standard. However, achieving this objective has been quite

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**Figure 1.**
The millennium development goals and targets

<table>
<thead>
<tr>
<th>Theme</th>
<th>Goals</th>
<th>Target</th>
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<tbody>
<tr>
<td>Poverty</td>
<td>1. Eradicate extreme poverty and hunger</td>
<td>1- Halve proportion of people living on &lt; $1 a day</td>
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<td></td>
<td></td>
<td>2- Halve proportion of people suffering from hunger</td>
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<td></td>
<td>2. Achieve universal primary education</td>
<td>3- Access to complete primary schooling</td>
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<td></td>
<td>3. Promote gender equality and empower women</td>
<td>4- Access for all genders to primary and secondary schooling (2005) and levels of education 2015</td>
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<td></td>
<td>4. Reduce child mortality</td>
<td>5- Reduce under-five mortality rate by 2/3,</td>
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<td></td>
<td>5. Improve maternal health</td>
<td>6- Reduce maternal mortality ratio by 3/4</td>
</tr>
<tr>
<td></td>
<td>6. Combat HIV/AIDS, malaria, and other diseases</td>
<td>7- Halt and begin to reverse the spread of HIV</td>
</tr>
<tr>
<td></td>
<td>7. Ensure environmental stability</td>
<td>8- Halt and begin to reverse the incidence of malaria</td>
</tr>
<tr>
<td></td>
<td>8. Develop a global partnership for development</td>
<td>9- Integrate principles of sustainable development</td>
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<tr>
<td></td>
<td></td>
<td>10- Access to safe drinking water and sanitation</td>
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<td></td>
<td></td>
<td>11- Improve lives of at least 100 million city dwellers</td>
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<td></td>
<td></td>
<td>12- Develop trading/financial systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13- Address needs of LDCs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14- Address needs of landlocked countries</td>
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<tr>
<td></td>
<td></td>
<td>15- Deal with debt problems and make them sustainable</td>
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<td></td>
<td></td>
<td>16- Provide decent and productive work for youth</td>
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<tr>
<td></td>
<td></td>
<td>17- Access to affordable/essential drugs</td>
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<td></td>
<td></td>
<td>18- Availability of new technology/ICTs</td>
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**Source:** Claessens and Feijen (2006)
elusive in many countries. Understanding the theory around economic growth is hence crucial. It is about explaining its sources, what causes it to accelerate or to decrease. In terms of the size of the economy, South Africa is ranked 31st in the world, with a gross domestic product (GDP) of US$285.3 billion (World Bank, 2011). Negligible growth in the 1980s contributed to an overall decline in living standards in South Africa, while population growth far outpaced economic expansion. From 1990 to 1992, real GDP growth was negative, it averaged 0.3 per cent during 1991-1994, rising to 4.6 per cent in 1996. However, the Asian crisis impacted severely on the economy and growth consequently slowed from 2.6 per cent in 1997 to 0.5 per cent in 1998. The economy recovered in 1999 with a growth rate of 2.4 per cent; this continued up to 2006 when a growth rate of 4.2 per cent was achieved. In order for African countries to achieve the primary MDGs, at least average 7 per cent year-on-year GDP growth is required (United Nations Millennium Project, 2006).

Therefore, sources, processes and dimensions of economic growth are some of the themes that preoccupy recent development economics research. One of the reasons for this is the concern for alleviating poverty, which appears to be widespread in the developing world. As such, researchers that examine endogenous growth models and associated policy seek to do so from a poverty-alleviating growth perspective. Understanding the sources of economic growth could benefit the wider society through pointing the direction to the possibility of achieving economic and socio-political development. In China, GDP growth averaging about 10 per cent a year has lifted more than 600 million people out of poverty and all MDGs also have either been reached or are within reach (World Bank, 2012). With rapid economic growth between 2006 and 2011, Rwanda reduced the number of people living in poverty from 57 to 45 per cent, lifting at least 1 million people out of poverty. Paul Collier described the Rwandan growth experience as a rare “hat trick” of rapid growth, sharp poverty reduction and reduced inequality (Terill, 2012).

The literature identifies several factors that drive economic growth. These include investment ratio (Marx, 1867; Pagano, 1993; Greenwood and Jovanovic, 1990; Weber, 1905/1930), human capital (Romer, 1986; Kaldor, 1957; Arrow, 1962), research and development and trade openness (Lewis, 1980; Bhagwati, 2004) and so on.

Experts and opinion leaders believe that policies that promote economic growth are essential for achieving MDGs. Economic growth is a powerful tool to reduce poverty. Higher rates of economic growth would create higher levels of employment, thereby reducing unemployment. It is believed that economic growth reduces poverty. When growth is associated with higher employment and productivity, incomes of the poor increase leading to higher consumption and investment (United Nations Development Programme, 2010). Economic growth could benefit the South African government through increased tax revenue collection and reduction in payments on unemployment benefits and social security grants. The improvement in the fiscal position would enable them to spend more on important public services like health, transport and education.

Economic growth also improves education outcomes by promoting school participation, and health development by increasing life expectancies and reducing child mortality rates (Barro and Lee, 2001; World Bank, 1993). Countries that grow strongly, and for sustained periods of time, are able to reduce their poverty levels significantly, strengthen their democratic and political stability, improve the quality of their natural environment, and even diminish the incidence of crime and violence (Dollar and Kraay, 2002; Fajnzylber et al., 2002). Bruno et al. (1998) estimate income elasticity of headcount poverty ratio to be in the range of -2 to -3. Similarly, World Bank (2001)
suggests that income elasticity of poverty would be of the order of -2. These studies suggest that one percentage point additional growth in per capita income (consumption) reduces the proportion of people below the poverty line of $1 a day by 2-3 per cent. Ram (2006) reviews the recent literature and suggests that a more realistic elasticity value of -1 would be more appropriate for medium-term policy purpose. However, some others caution that sustaining economic growth cannot be taken for granted. Chatterjee (2006) suggests that for non-income MDG targets in health and education, there is a weak relationship between increases in per capita GDP and improvements in non-income MDG targets, particularly for low-income countries.

Since MDGs were established in 2000, an enormous effort has been made to mobilise resources to reduce poverty, discrimination and disease in poor countries. However, research has shown that it is not all growth initiatives that are linked to improvements in poverty, education and health (Bourguignon et al., 2008). Policies that create growth but do not directly benefit the poor or improve education, and health in a country may not help attain MDGs. For example, government policies involving service delivery fail to reach the poor in rural and remote areas, and when some services are provided, they rarely reduce poverty (United Nations Development Programme, 2007).

It is in this context that some analysts identify financial development as a possible strategy capable of linking economic growth to poverty alleviation and the achievement of MDGs. Financial development improves the financial sector in a country so that it more efficiently allocates capital between lenders and borrowers. A more developed financial sector promotes economic growth (Levine, 2004). Therefore, financial development may indirectly help achieve MDGs by stimulating growth. Recent research has also shown that financial development directly reduces poverty without increasing income inequality (Beck et al., 2004; Rosner, 2010). Li et al. (1998) find that financial depth strongly and significantly contributes to lowering inequality and to raising the average income of the lower 80 per cent of the population. Also, Honohan (2003) shows that in 70 developing countries a 10 percentage point increase in the ratio of private sector credit provided by the banking sector will reduce poverty ratio by 2.5-3 percentage points. There may hence be a link between improvements in the financial sector and the achievement of MDGs beyond its effect on economic growth.

Hence, the objectives of the study are to examine whether:

1. financial development, solely or together with economic growth, influences the attainment of MDGs;
2. financial development, solely or together with MDGs, influences economic growth performance; and
3. MDGs, solely or together with economic growth, influence financial development.

2. South Africa and the MDGs
South Africa has made notable progress in meeting each of the MDGs. These achievements are here described.

2.1 Goal 1
National poverty level in South Africa hovered around a little over 50 per cent for the decade between 1993 and 2002 (see Table I). In 2000, the poorest 20 per cent accounted for 2.8 per cent of households expenditure compared to the wealthiest 20 per cent who
accounted for 64.5 per cent of all expenditure (United Nations Development Programme (UNDP), 2009). Poverty level decreased from 2002 reaching its lowest level of 43 per cent in 2006. Using the upper-bound poverty line which takes into consideration both food and non-food needs, Statistics South Africa (2012) estimated that approximately 52.3 per cent of the population was living below the poverty line between 2006 and 2009.

Concerning severe malnutrition amongst children under-five years of age, there has been a decline from 88,971 cases in 2001 to 30,082 in 2005, thanks to the country’s social assistance grants which increased from R10 billion in 1994 to R37.1 billion in 2004. Social grants have played a very critical role in poverty reduction in South Africa. A number of studies point to the fact that it is well targeted, with 62 per cent of the total going to the poorest 40 per cent of households, and 82 per cent to the poorest 60 per cent. From 2.5 million beneficiaries in 1999 to just over 12 million in 2007, the social grants system is the largest form of government support for the poor. Most of it in the form of child support grant, which reached 7.8 million beneficiaries in 2007 compared to 34,000 in 1999 (South African Presidency, 2008).

It is a puzzle that poverty did not decrease in South Africa between 1993 and 2002 despite the quite respectable growth in GDP (see Table I). Economic growth during this time might have by-passed the poor in South Africa. During periods of high rates of economic growth it was those who were already well-off who were better positioned to take advantage of that growth (South African Presidency, 2008). Poverty has in fact trended upwards since 2006. Hence, some experts suggest that the “poverty trap” might be getting more perpetuated rather than being broken (Gore, 2003).

2.2 Goals 2 and 3
At about 6 per cent of the GDP, South Africa’s education budget is among the highest in the world (UNDP, 2009). School enrolment is increasing; over 98 per cent of seven- to 13-year old children attended education institutions in 2006 and 98 per cent of 18-year old children had completed Grade 7 and above in 2006. South Africa’s gross enrolment ratios suggest that a relatively small percentage of primary school aged children are not at school. Girls tend to outnumber boys in secondary school enrolment (UNDP, 2009).

2.3 Goals 4, 5 and 6
Free health care policy has encouraged an increase in the number of outpatient departmental visits since the inception of the programme. Attendance at health care centres, by pregnant women, is increasing as are paediatric treatments.

In 1990, South Africa’s mortality rate for children under the age of five years was 58. By 2000, this had dropped to 37, but by 2010 it had jumped up to 50.9. This could affect the attainment of country’s goal of child mortality rate of 19.3 by 2015 (South African Health Systems Trust, 2010). Maternal mortality rate, rather than decreasing,

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<tr>
<td>Poverty headcount index (%)</td>
<td>50.1</td>
<td>50.5</td>
<td>51.9</td>
<td>53.2</td>
<td>51.2</td>
<td>51</td>
<td>52</td>
<td>50.8</td>
<td>51.4</td>
<td>49.0</td>
<td>47.4</td>
<td>46.9</td>
<td>44.5</td>
<td>43.2</td>
<td>52.3</td>
</tr>
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Sources: Van der Berg et al. based on AMPS of various years (1993-2004); Statssa (2012)
effectively doubled between 1990 and 2007, climbing to 410. It may therefore be difficult to realise the goal in 2015, of a maternal mortality rate of about 58.

An estimated 4.5 per cent of the South African population was HIV positive in 1995. In 1999, this figure peaked at 12.9 per cent, then slowly started to fall and is currently at about 10.5 per cent. In short, the spread of HIV is slacking off, but not at the rate needed to meet the 2015 deadline. Major causes of maternal mortality include non-pregnancy-related infections (31.4 per cent); complications of hypertension in pregnancy (20.7 per cent); obstetric haemorrhage (13.9 per cent); pregnancy-related sepsis (12.4 per cent); and pre-existing medical conditions (7.0 per cent). The non-pregnancy-related infections, including AIDS, has increased from 23 per cent in 1998 to 31.4 per cent in the current triennium (UNDP, 2009). At the current rate of development, South Africa may encounter obstacles in order to achieve some of the MDGs such as those pertaining to health targets (Financial and Fiscal Commission, 2011)[1].

2.4 Goal 7
The proportion of households having access to clean/improved water increased from 60 per cent in 1995 to 85.5 per cent in 2003 and 91 per cent in 2010. By December 2004, ten million people had since 1994 gained access to basic clean water supply. Access to sanitation increased from 49 per cent of households in 1994 to 63 per cent in 2003 (UNDP, 2009).

2.5 Goal 8
Regional integration remains a key policy focus of the country. South Africa has large and well-developed banking (more than 40 per cent of Africa’s assets) and insurance sectors (more than 70 per cent of Africa’s premiums). Its financial institutions’ growing presence in other parts of the continent allows them to provide trade finance and acquisition support for companies looking to invest and develop trade links in Africa. They also have links with Chinese and Indian partners. The alliance between Nedbank and Ecobank of West Africa created perhaps the largest banking network in Africa (1,500 branches in 35 countries) (Price Waterhouse Coopers, 2012, p. 17). The South African stock market is Africa’s premier exchange and the most sophisticated stock exchange comparable to those in developed countries.

This paper reports the findings of an empirical study examining the relationship, in South Africa, between financial sector development, economic growth and MDGs for poverty reduction (MDG 1), education (MDGs 2 and 3), and health development (MDGs 4, 5 and 6). Previous research (see Claessens and Feijen, 2006) has shown that sub-Saharan Africa is still far behind in achieving these MDGs. Unlike Odhiambo (2009) who focused only on the first MDG, this paper deepens our understanding by examining the relationship between financial development, economic growth, three themes and six key MDGs in South Africa.

The remainder of the paper is organised as follows: we first try to explain the link between financial development, economic growth and MDGs. In Section 2 we highlight South Africa’s achievements regarding MDGs. Section 3 present the linkage between the development of the financial sector development and the real sector of the economy and hence economic growth. Subsequently, we give an overview of financial development and selected MDGs in South Africa. Section 4 discusses data sources, definitions and research methodology. In Section 5, empirical findings are presented while the last section concludes the paper.
3. The importance of the development of both the financial sector and the real sector of the economy

Financial development is associated with the ability of the financial sector to acquire information, enforce contracts, facilitate transactions and create incentives for the emergence of particular types of financial contracts, markets and intermediaries, and all this at a low cost (Rajan and Zingales, 2003, p. 9; Levine, 1999, p. 4). This occurs when financial instruments, markets and intermediaries ameliorate – though not necessarily eliminate – the effects of information, enforcement and transaction costs, and therefore better provide financial services. Sophisticated financial systems are now seen as a defining feature of the advanced economies – but this was not always the case. Economists’ understanding of the nature of the relationship between financial systems and economic growth has evolved over time. One of the earliest to write on this issue was Bagehot (1873/1920). At the height of British industrial power, he wrote that what separated England from “all rude countries” was the ability of its financial markets to mobilise savings to finance “immense works”. Bagehot hence defined two primary roles of financial markets as facilitating the accumulation of capital and managing risk inherent in particular investment projects and industries.

Later, other economists such as Schumpeter (1911/1936/1949) elaborated that financial intermediaries facilitate technological innovation by assembling savings, evaluating investment projects, monitoring managers and facilitating transactions. In the Schumpeterian model, banks create entrepreneurs, who carry out new combinations of production that lead to economic growth. “The structure of modern industry could not have been erected without it [credit] […] and in carrying out new combinations, financing as a special act, is fundamentally necessary in theory as a practice” (Schumpeter, 1911/1936/1949). By not only transferring existing purchasing power to the fund user, but also creating new purchasing power for financing production, banks act as the initiators of the economic development process. Schumpeter opined that financial development affects economic growth through technological changes and this is better provided by banking institutions than stock markets.

Goldsmith (1969), McKinnon (1973) and Shaw (1973) later emphasised the role of capital accumulation in economic growth. In the McKinnon-Shaw model, a well-developed financial system mobilises savings by channelling small-denomination savings into profitable large-scale investments. According to them, these savings might not be available for investment without the participation of financial institutions, because mobilising savings of diverse savers is usually costly, due to the existence of information asymmetries and transaction costs. Financial institutions lower the cost of mobilising savings and also provide attractive instruments and savings vehicles, while offering savers a high degree of liquidity. Unlike Schumpeter, they did not distinguish between the banking sector and the stock market. According to them, both of them play an important role in the process of economic growth.

Much as they tried, earlier authors failed to explain clearly the channel through which finance affects growth. Levine (1997, 1999) has been at the forefront of economists that have brought clarity to this important link. Levine considers financial services as affecting economic growth through five main channels, namely: savings mobilisation, resource allocation, risk management, management monitoring and trade facilitation. By considering the functions of the financial sector in a comprehensive manner, Levine is able to demonstrate a significant role for financial markets that was not present in earlier models that used a narrower definition (e.g. Goldsmith, 1969). Each of the five main
channels contributes to both capital accumulation and the process of technological innovation. These, in turn, feed directly to economic growth.

This link also shows the relationship between financial development and some MDGs. It is widely acknowledged that the real sector of the economy includes household consumption, investment, trade (exports and imports) and government spending. Thus, any relationship that can increase household consumption, investment, trade and government spending will definitely have a positive effect on the real sector of the economy. Claessens and Feijen (2006) suggest that financial development and household expenditure are highly correlated and that there is evidence that financial development is a leading indicator for increases in household consumption. They find that if private credit increases by 1.6 per cent annually in the next ten years, world household expenditure would be 1.1 and 3.6 per cent higher than the current level (Claessens and Feijen, 2006). Household consumption expenditure in South Africa rose from R56,152 in 2005/2006 to about R95,183 in 2010/2011 – a nominal increase of 69.5 per cent. Totally, 32 per cent of households’ expenditure went to housing expenses, including water, electricity and other utilities, and averaged R30,505 annually. Food and non-alcoholic beverages made up 12.8 per cent of household expenditure, at an average of R12,200 per annum (Statistics South Africa, 2012). Financial development in the country could have contributed to this experience.

As financial development reduces poverty, households purchase essential assets such as houses, start their businesses, receive and enjoy remittances, and people may also be able to pay for health expenses. They could save in order to be prepared for unexpected health costs. As families become healthier, children are more able to participate in school. Children do not have to drop out of school in order to spend time at home to help sick family members. Thus, by improving the real sector of the economy through household consumption, financial development improves household welfare and impacts on MDGs.

Financial development also increases investment through the allocation of capital to the private sector. Access to finance is important for firms. The second leading constraint on doing business after taxes and regulation is finance (World Bank, 2000). However, Batra et al. (2003) ranks the lack of finance as the main constraint in Africa and China. Furthermore, using the World Business Environment Survey, recent research concludes that finance is the most important constraint on firm growth (Ayyagari et al., 2005). Other studies such as Rajan and Zingales (1998), Perotti and Volpin also find that the number of firms in an industry grows disproportionally faster in counties that have better financial development and also the number of firms in sectors that are more dependent on external finance grows 0.7 faster in countries with better financial development. Furthermore, Black and Strahan (2002) find that the odds of an individual starting a business increase by 5.6 per cent were that individual to move to a financially more developed region, and Guiso et al. (2004) conclude that GDP is 1.2 per cent higher in financially more developed regions. Thus, with greater access to finance, firms can growth faster.

Beck (2003) finds that an industry in a country with higher levels of financial development has higher export shares. There are also greater trade balances in industries that use more external finance. According to Claessens and Feijen (2006), gains from better transaction services through more developed financial systems can be large. By facilitating transactions, financial development improves trade at the national and international levels, because the easier it is to make reliable financial transactions, the friendlier is the trading environment (Claessens and Feijen, 2006). Beside this, financial
intermediaries with their products such as credit cards, debit cards and so on also facilitate domestic and international payment services. This enables convertibility between currencies, and the settlement of international payments. This also facilitates trade. Without the presence of financial intermediaries it will be difficult for developing countries to participate in world trade because their currency are not popular nor convertible compared with international currencies like the dollar, pound or euro.

However, some recent finance and growth literature report that financial development has a diminishing marginal impact on economic growth. Rioja and Valev (2003) show that financial development promotes more growth for countries with intermediate levels of financial development than for countries with high levels of financial development. Humphrey et al. (2001) suggest that the USA would have saved between 1 and 1.5 per cent of their GDP if they migrated from a paper-based to a well-functioning electronic payment system.

Finally, financial development improves government spending. Governments of developing countries typically spend resources equivalent to between 15 and 30 per cent of their GDP (Herrera and Pang, 2005). Hence, small changes in the efficiency of public spending could have a significant impact on GDP and on the attainment of government’s objectives. On average, developing countries spend much less than developed countries. For example, total government outlays as a percentage of GDP in Organisation for Economic Cooperation and Development countries range from 27 per cent in 1960 to 48 per cent in 1996 (Gwartney et al., 1998), compared to 13.4 per cent in most developing countries. This low public spending might be explained by the underdevelopment of their financial sector. A large and liquid government bond market could enable government to raise cheap capital to finance its budget and invest in key infrastructures (Claessens and Feijen, 2006). In addition, a mature government bond market can prevent crowding out of private investments in the banking sector. At the same time, an active bond market can discipline profligate government, thereby reducing the risks of a fiscal crisis and its adverse consequences on the population (Claessens and Feijen, 2006).

3.1 Financial development and economic growth in South Africa

The most important financial institutions in the country are the banks and the stock market. Their assets amounted to 109 per cent and 187 per cent of the GDP by the end of 2004 (International Monetary Fund, 2005). The contribution of the financial sector to the South African GDP has grown steadily and continues to increase. The banking sector contributes an estimated 35 per cent of the country’s value added (Hawkins, 2004). At the apex of the banking system is the South African Reserve Bank, which is, inter alia, the primary monetary authority and custodian of the country’s gold and foreign exchange reserves. The primary functions of the Reserve Bank are to protect the value of the rand and to control inflation. The banking sector is highly concentrated, with no government ownership.

International sanctions and political isolation triggered a major foreign debt crisis in 1985 when a group of international banks, led by Chase Manhattan, withdrew substantial credit lines. The banks refused to roll over existing loans, and called in many of the short-term loans. The value of the rand dropped drastically as a result, and the government reacted by temporarily closing its stock and foreign exchange markets (US Library of Congress, 1998).

Between 1993 and 2002, the financial services sector grew nearly twice as fast, at an average of 4.5 per cent per year. The financial services sector has been relatively buoyant since 1996, outgrowing the rest of the economy each year (apart from 2002) and proving to be a source of growth for the economy overall.
Since 1997, however, the financial services sector has been shedding jobs. Employment in the economy as a whole has been declining annually, for the whole period shown except 2002, when employment grew by 0.1 per cent. Employment grew in the financial services sector in 1994, 1995 and 1996, but has declined each year since then. The top 22 banks cumulatively terminated 9,000 jobs in 2002 (Price Waterhouse Coopers, 2003), and the closure of some of the smaller banks also led to employment losses. Corporate amalgamations in 2002 also reduced employment in the insurance industry. In the last decade, a number of modern innovative facilities have been introduced or enhanced by the South African banking industry, sometimes earlier than other higher-income countries.

3.2 Financial development is also associated with improvements in MDGs

The relationships between financial development and MDGs have not been much researched to date. The few works that have focused on this generally conclude that financial development can help in achieving MDG targets. For example Claessens and Feijen (2006) find that there is a positive relationship between financial sector development and MDGs, with some evidence of causal relationships, although the quality of data does not allow for strong tests. Supporting case study evidence – using household surveys and specific interventions suggests that there are beneficial causal impacts of financial development on MDG targets, as well (Claessens and Feijen, 2006). Furthermore, Honohan (2004) suggests that a 10 per cent increase in private credit to GDP reduces poverty ratios by 2.5 to 3 per cent. This finding implies that there is much to gain from financial sector development. Quartey (2005) finds that financial sector development induces poverty reduction in Ghana.

The channels through which finance helps economic development have been clearly identified: greater private sector development, increases in productivity and capital accumulation, improvements in competition and innovation, and greater risk-sharing and lower volatility. Evidence also shows that benefits from greater financial sector development can come from all forms of financial intermediation such as banks, capital markets among others.

Through improvements in the real sector of the economy, financial development also affects and is affected by MDG objectives as shown in Figure 2.

![Figure 2. Relationships between finance, income and the millennium development goals under study](image)

**Note:** We have modified Figure 2 of Claessens and Feijen (2006) to incorporate other channels by which financial development, economic growth and MDGs could affect each other.

**Source:** Adapted from Claessens and Feijen (2006)
4. Data sources and definition of variables
This paper uses two indicators of financial development, namely: the ratio of broad
money to GDP (M3/GDP) and the ratio of credit to the private sector to GDP (PC/GDP).
GDP is the real gross domestic product.
PC/GDP indicates the important role played by the financial sector in the economy.
It is assumed that credit provided to the private sector generates increases in
investment and productivity to a much larger extent than do credits to the public sector
(Kar and Pentecost, 2000). Higher levels of this ratio are interpreted as higher levels
of financial services and therefore greater financial development (Seetanah, 2008).
M3/GDP shows the real size of the financial sector of a growing economy. The ratio
is therefore expected to increase over time if the financial sector develops faster than
the real sector on the one hand, and decrease if the financial sector develops slower
than the real sector, on the other.

MDGi stands for the four MDGs target variables. These consist of per capita
household expenditure on food (LFOOD/N), on health (LHEALTH/N), on clothing
(LCLOTH/N) and on education (LEDUC/N). Annual time series data, which covers
the 1970 and 2010 period, has been obtained from electronic database of the South
African Reserve Bank (2012). Household expenditure on food and clothes are
indicators of attempts to improve sustenance and welfare and are good indicators of
attempts to reduce poverty. Household expenditure on education covers, among
others, school fees, purchase of education materials, school feeding, payment for
school transport, camping trips, and school uniforms and are closely related to
indicators such as literacy rates, gross and net enrolment rates at primary and
secondary levels which are not available on regular (annual) basis to permit time
series analysis. Similarly, household spending on health covers out of pocket
expenditure, including consultations with physicians, purchase of medicine which
are closely related to indicators such as infant mortality/maternal mortality,
which are direct MDG targets but are not available on annual basis to permit time
series analysis.

4.1 Methodology
The paper follows closely the approach of Quartey (2005), Odhiambo (2009) and
others. We use the autoregressive distributed lag (ARDL) model to examine
long- and short-run relationships between MDGs, financial development and
economic growth in South Africa. The ARDL is not popular in economic
development studies especially those that focus on Africa. The revival of
ARDL methods occurred in the late 1990s with the work of Pesaran et al. (2001).
Many studies have since used it for Granger causality tests including Zachariadis
(2007), Keong et al. (2005), Harvie and Pahlavani (2006), Verma (2007) and
so on.

Thus, following Pesaran et al. (2001) and Zachariadis (2007), financial development,
MDG and economic growth relationship can be modelled as:

\[ \Delta \ln \text{FD}_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta \ln \text{FD}_{t-i} + \sum_{j=0}^{k} \beta_{2j} \Delta \ln Y_{t-j} + \sum_{u=0}^{m} \beta_{3u} \Delta \ln \text{MDG}_{t-u} \\
+ \beta_4 \ln Y_{t-1} + \beta_5 \ln \text{FD}_{t-1} + \beta_6 \Delta \ln \text{MDG}_{t-1} + \epsilon_{1t} \quad (1) \]
\[ \Delta \ln \text{MDG}_t = \alpha_0 + \sum_{u=1}^{m} \alpha_{1u} \Delta \ln \text{MDG}_{t-u} + \sum_{i=0}^{n} \alpha_{2i} \Delta \ln \text{FD}_{t-i} + \sum_{j=0}^{k} \alpha_{3j} \Delta \ln Y_{t-j} \]
\[ + \alpha_4 \ln Y_{t-1} + \alpha_5 \ln \text{FD}_{t-1} + \alpha_6 \ln \text{MDG}_{t-1} + \epsilon_2 \tag{2} \]

\[ \Delta \ln Y_t = \partial_0 + \sum_{u=1}^{m} \partial_{1u} \Delta \ln Y_{t-u} + \sum_{i=0}^{n} \partial_{2i} \Delta \ln \text{FD}_{t-i} + \sum_{j=0}^{k} \partial_{3j} \Delta \ln \text{MDG}_{t-j} \]
\[ + \partial_4 \ln Y_{t-1} + \partial_5 \ln \text{FD}_{t-1} + \partial_6 \ln \text{MDG}_{t-1} + \epsilon_2 \tag{3} \]

where \( \Delta \) is the first difference operator, \( \epsilon_1 \) and \( \epsilon_2 \) are mutually uncorrelated white noise residuals, \( \text{FD}_t \) is the indicators of financial development (which are two in this study), \( \text{MDG} \) is a particular target of MDG and \( Y_t \) is the indicator of economic growth. “\( n \)”, “\( m \)” and “\( k \)” are, respectively, the optimum lag length of financial development, MDG and economic growth which have been determined using the AIC and PFE criterion. The coefficients \( \beta_4, \beta_5, \beta_6, \alpha_4, \alpha_5, \alpha_6, \partial_4, \partial_5, \partial_6 \) and \( \partial_6 \) are used to determine the co-integration and the long-run relationship between financial development, MDG and economic growth.

The ARDL method is based on the joint F-statistic (or Wald statistic). Pesaran et al. (2001) proved that the distribution of this F-statistic is non-standard, irrespective of whether the repressors are I(0) or I(1), and have tabulated the appropriate critical values. Depending on the number of regressors and on whether an intercept and/or time trend is included in the equation, a pair of critical values are provided, which constitute an upper and a lower bound, respectively. The lower bound critical values assume that the explanatory variables are integrated of order zero, I(0), while the upper bound critical values assume that the explanatory variables are integrated of order I(1). Thus, if the F-statistic is greater than upper bound, the \( H_0 \) is clearly rejected and a long-run relationship exists among the test variables. If the F-statistic is smaller than the lower bound, then the null cannot be rejected and estimation can continue to assume no long-run relationship. If the statistic falls between the two bounds, then the result is inconclusive. The ARDL technique generally provides unbiased estimates of the long-run model and valid t-statistics even when some of the regressors are endogenous (Harris and Sollis, 2003). It is also reliable even for small observation unlike the Engle and Granger (1987) model.

Thus, the \( H_0 \) of no co-integration is being tested against the alternative hypothesis of existence of co-integration (\( H_1 \)):

\[ H_0: \beta_4 = \beta_5 = \beta_6 = 0 \text{ against } H_1: \beta_4 \neq \beta_5 \neq \beta_6 = 0 \text{ for Equation (1)} \]
\[ H_0: \alpha_4 = \alpha_5 = \alpha_6 = 0 \text{ against } H_1: \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq 0 \text{ for Equation (2)} \]
\[ H_0: \partial_4 = \partial_5 = \partial_6 = 0 \text{ against } H_1: \partial_4 \neq \partial_5 \neq \partial_6 \neq 0 \text{ for Equation (3)} \]

The computed F-statistic will be compared to the critical values tabulated in the table CI (ii) of Pesaran et al. (2001). Following the co-integration tests, we examine the direction of causality between the indicators of financial...
Development, economic growth and MDGs. This could be carried out following Equations (3) and (4):

$$\Delta \ln FD_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \ln FD_{t-i} + \sum_{j=0}^{q} \beta_{2j} \Delta \ln Y_{t-j} + \sum_{u=0}^{r} \beta_{3u} \Delta \ln MDG_{t-u} + \beta_4 ECT_{t-1} + \varepsilon_1$$

$$\Delta \ln MDG_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta \ln MDG_{t-i} + \sum_{j=0}^{q} \alpha_{2j} \Delta \ln FD_{t-j} + \sum_{u=1}^{r} \alpha_{3u} \Delta \ln Y_{t-u} + \alpha_5 ECT_{t-1} + V_t$$

$$\Delta \ln Y_t = \hat{c}_0 + \sum_{i=0}^{p} \hat{c}_{1i} \Delta \ln Y_{t-i} + \sum_{j=0}^{q} \hat{c}_{2j} \Delta \ln FD_{t-j} + \sum_{u=1}^{r} \hat{c}_{3u} \Delta \ln MDG_{t-u} + \hat{c}_4 ECT_{t-1} + \mu_t$$

where $ECT_{t-1}$ is the lagged error correction term obtained from the long-run equilibrium relationship. Short-run causality between financial development, MDG and economic growth is determined by the $F$-statistic while long-run causality is determined by the significance of the $t$-statistic of the coefficient of the error correction term. However, according to Zachariadis (2007, p. 1243), this causality test may not be necessary if a long-run relationship is found in Equations (1)-(3). This, in itself, would imply long-run causality between the variables.

5. Empirical results

5.1 Unit root test results

Results of stationarity tests at levels and first difference are presented in Table II, showing that the variables are integrated of the first order.

5.2 Results of bounds tests for co-integration

After testing for stationarity, we investigate co-integration that might exist among the variables included in the model. The ARDL co-integration procedure was implemented to estimate the parameters identified in Equations (1)-(3). The selection of the maximum lag length is based on the AIC and FPE criteria. Table III presents the results. Only one indicator of financial development (M3/GDP) is co-integrated with economic

<table>
<thead>
<tr>
<th>Variables (lag length in bracket)</th>
<th>Constant</th>
<th>Constant and trend</th>
<th>Stationary status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPC/GDP (9)</td>
<td>0.347218</td>
<td>-2.145120</td>
<td>I(1)</td>
</tr>
<tr>
<td>LM3/GDP (9)</td>
<td>0.334561</td>
<td>-0.196549</td>
<td>I(1)</td>
</tr>
<tr>
<td>LFOOD/N (9)</td>
<td>-1.768312</td>
<td>-1.896482</td>
<td>I(1)</td>
</tr>
<tr>
<td>LEHEALTH/N (9)</td>
<td>1.654699</td>
<td>-2.867730</td>
<td>I(1)</td>
</tr>
<tr>
<td>LCLOTH/N (9)</td>
<td>1.050343</td>
<td>-0.868878</td>
<td>I(1)</td>
</tr>
<tr>
<td>LEDUC/N (9)</td>
<td>-1.529718</td>
<td>-1.508973</td>
<td>I(1)</td>
</tr>
<tr>
<td>LY (9)</td>
<td>0.683808</td>
<td>-1.897106</td>
<td>I(1)</td>
</tr>
<tr>
<td>ΔLPC/GDP (9)</td>
<td>-7.176771</td>
<td>-7.649744</td>
<td>I(0)</td>
</tr>
<tr>
<td>ΔLM3/GDP (9)</td>
<td>-3.503947</td>
<td>-4.579845</td>
<td>I(0)</td>
</tr>
<tr>
<td>ΔLFOOD/N (9)</td>
<td>-3.832208</td>
<td>-3.850574</td>
<td>I(0)</td>
</tr>
<tr>
<td>ΔLEHEALTH/N (9)</td>
<td>-4.038533</td>
<td>-4.194690</td>
<td>I(0)</td>
</tr>
<tr>
<td>ΔLCLOTH/N (9)</td>
<td>-1.985881</td>
<td>-3.880913</td>
<td>I(0)</td>
</tr>
<tr>
<td>ΔLEDUC/N (9)</td>
<td>-4.174852</td>
<td>-4.358033</td>
<td>I(0)</td>
</tr>
<tr>
<td>ΔLY (9)</td>
<td>-4.114528</td>
<td>-4.146192</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

Table II. Results for unit roots tests on levels and first differences using DF-GLS
<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independents variables</th>
<th>Maximum lag length</th>
<th>$F$-statistic (Wald statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ratio of liquid liabilities to GDP</td>
<td>ΔLReal GDP, ΔFOOD/N</td>
<td>(3,3,3)</td>
<td>4.122114**</td>
</tr>
<tr>
<td></td>
<td>ΔLReal GDP, ΔHEALTH/N</td>
<td>(3,3,3)</td>
<td>3.198937</td>
</tr>
<tr>
<td></td>
<td>ΔLReal GDP, ΔCLOTH/N</td>
<td>(3,3,1)</td>
<td>3.198937</td>
</tr>
<tr>
<td></td>
<td>ΔLReal GDP, ΔLEDUC/N</td>
<td>(3,3,3)</td>
<td>3.408927*</td>
</tr>
<tr>
<td>The ratio of private credit to GDP</td>
<td>Real GDP, ΔFOOD/N</td>
<td>(1,1,1)</td>
<td>2.270133</td>
</tr>
<tr>
<td></td>
<td>Real GDP, ΔHEALTH/N</td>
<td>(1,1,1)</td>
<td>2.428233</td>
</tr>
<tr>
<td></td>
<td>Real GDP, ΔCLOTH/N</td>
<td>(1,1,1)</td>
<td>2.116128</td>
</tr>
<tr>
<td></td>
<td>Real GDP, ΔLEDUC/N</td>
<td>(1,1,1)</td>
<td>3.240149</td>
</tr>
<tr>
<td>Per capita household food spending</td>
<td>ΔLReal GDP, ΔLM3/GDP</td>
<td>(2,2)</td>
<td>0.936581</td>
</tr>
<tr>
<td></td>
<td>ΔLReal GDP, ΔPC/GDP</td>
<td>(2,2)</td>
<td>0.229223</td>
</tr>
<tr>
<td>Per capita household health spending</td>
<td>ΔLReal GDP, ΔLM3/GDP</td>
<td>(2,2)</td>
<td>0.954879</td>
</tr>
<tr>
<td></td>
<td>ΔLReal GDP, ΔPC/GDP</td>
<td>(2,2)</td>
<td>6.241552***</td>
</tr>
<tr>
<td>Per capita household cloth spending</td>
<td>ΔLReal GDP, ΔLM3/GDP</td>
<td>(1,1)</td>
<td>3.619727*</td>
</tr>
<tr>
<td></td>
<td>ΔLReal GDP, ΔPC/GDP</td>
<td>(1,1)</td>
<td>3.763119*</td>
</tr>
<tr>
<td>Per capita household education spending</td>
<td>Real GDP, M3/GDP</td>
<td>(3,3)</td>
<td>2.339898</td>
</tr>
<tr>
<td></td>
<td>Real GDP, PC/GDP</td>
<td>(2,2)</td>
<td>1.085006</td>
</tr>
<tr>
<td>Pesaran critical value Table CI (ii) case II</td>
<td>Critical value (%)</td>
<td>Lower bounds value</td>
<td>Upper bounds value</td>
</tr>
<tr>
<td></td>
<td>1***</td>
<td>4.13</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>5**</td>
<td>3.10</td>
<td>3.87</td>
</tr>
<tr>
<td></td>
<td>10*</td>
<td>2.63</td>
<td>3.35</td>
</tr>
</tbody>
</table>
growth and poverty reduction in the form of increased per capita spending on food and education. Poverty reduction targets of increased per capita household spending on health and clothing, respectively, are also co-integrated with economic growth and financial development. According to Zachariadis, finding evidence of co-integration using bounds test is equivalent to establishing a long-run relationship between the variables. It also establishes the direction of long-run causality between the variables.

Thus, from Table III we might conclude, that in South Africa, it seems in the long run, that poverty reduction in the form of increased spending on health and clothing, is Granger caused by economic growth and financial development. Financial development, in the form of increased money supply is, however, Granger caused by economic growth and poverty reduction.

When co-integration exists, the relationship between the variables will be transformed into an error correction model (ECM) and the parameters associated with the causality are identified (Engle and Granger, 1987; Johansen and Juselius, 1990). If the error correction term has the expected sign and statistically significant in the models, this is another confirmation of the existence of the long-run relationship among the variables in equations and hence we observe long-run convergence.

5.3 Causality test

Since co-integration only gives information about the long-run causality, it is useful to examine the direction of short-run causality between indicators of financial sector development, economic growth and MDGs. We have constructed the ECM, testing the significance of the coefficient of the lagged error correction term and joint significance of the lagged differences of the explanatory variables using a Wald test. The fourth column contains the $\chi^2$ (1) statistic from a Wald test on the lagged differences of the explanatory variables. ECT is the coefficient on the error correction term; $t$-statistic is the $t$-statistic on the ECT. The long-run causality test result is determined by the significance of the error correction term.

Table IV reports the results of our causality tests. In the short run, financial development, real GDP and the poverty reduction indicators have short-run causality. Economic growth together with the attainment of MDG targets, such as a reduction in poverty, jointly cause financial sector development. Similarly, economic growth and

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independents variables</th>
<th>$t$-statistic on ECT</th>
<th>$F$-statistic (short run)</th>
<th>Causal flow</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLM3/GDP</td>
<td>$\Delta$LReal GDP,</td>
<td>$-0.20800^{**}$</td>
<td>5.084673*** MDG→FD</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LFOOD/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LReal GDP,</td>
<td>$-0.239417^*$</td>
<td>5.4011578*** MDG→FD</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LEDUC/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLHEALTH/N</td>
<td>$\Delta$LReal GDP,</td>
<td>0.032381</td>
<td>4.855903***</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LPC/GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLCLOTH/N</td>
<td>$\Delta$LReal GDP,</td>
<td>$-0.152682$</td>
<td>6.304826***</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LM3/GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LReal GDP,</td>
<td>$-0.056308$</td>
<td>11.60888***</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\Delta$LPC/GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table IV. Short-run and long-run Granger causality based on bounds test

Development goals in South Africa
financial sector development jointly cause the attainment of MDG target of poverty reduction. These results are highly significant. However, long-run causality exists between financial development, real GDP and increased expenditure on food as well as education. Attaining MDG target of poverty reduction by increasing per capita expenditure on food and education as well as economic growth jointly cause financial sector development. This is reflected in the significance of the t-statistics on the coefficients of their error correction terms. However, poverty reduction, as may be reflected in increased real per capita expenditure on clothing and on health, does not have long-run causal relationship with financial sector development and economic growth.

6. Conclusion
The econometric methodology, which has been applied in this paper, allows us to examine the relationship between two indicators of financial sector development, economic growth and four targets of MDGs in South Africa. Financial development, real GDP and the attainment of MDGs have short-run causality. Economic growth and the attainment of MDG target jointly cause financial sector development. Similarly, economic growth and financial sector development jointly cause the attainment of MDGs.

However, long-run causality exists between financial development, real GDP and increased expenditure on food as well as education. Attaining MDGs through increased per capita expenditure on food and education as well as economic growth jointly cause financial sector development in South Africa.

The findings highlight the complexity of the relationship between financial development, economic growth and MDGs. It is essential that the government of South Africa pursue a three track strategy of promoting financial sector development, economic growth and MDGs. The development of one strategy, causes and is caused by the development of the other two.

Note
1. In South Africa, there were 32,000 nurse vacancies in the public sector and 35,000 registered nurses are either inactive or unemployed early in the 2000s (Organization for Economic Cooperation and Development, 2004).

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