



Report

The macroeconomic effects of development finance institutions in sub-Saharan Africa

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Cover photo: © John Hogg/World Bank: Rossing Uranium Mine lies about 70km inland from Swakopmund close to the small town of Arandis. It was founded by amateur geologist Capt. Peter Louw in 1928 largely owned by the Rio Tinto Group (69% shares). In 2006 the mine produced about 7% of the world production of primary produced uranium. The mine is a long term supplier of uranium to the world nuclear power industry. Haul trucks being repaired and serviced at the workshop on the mine.

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Abbreviations

ACP	African, Caribbean and Pacific
AfDB	African Development Bank
BIO	Belgian Investment Company
CDC	UK Development Finance Institution
Cofides	Compañía Española de Financiación del Desarrollo
CPI	Climate Policy Initiative
Danida	Danish International Development Agency
DEG	Deutsche Investitions und Entwicklungsgesellschaft
DFI	Development Finance Institution
EBRD	European Bank for Reconstruction and Development
EDFI	European DFI
EIB	European Investment Bank
ELF	Emergency Liquidity Facility
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FMO	Dutch Development Bank
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GMM	Generalised Method of Moments
IEG	Independent Evaluation Group
IFC	International Finance Corporation
IFU	Industrialization Fund for Developing Countries
IOB	Policy and Operations Evaluation Department
LDC	Least Developed Country
LIC	Low-Income Country
Norad	Norwegian Agency for Development Cooperation
ODA	Official Development Assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OeEB	Oesterreichische Entwicklungsbank
OLS	Ordinary Least Squares
OPIC	Overseas Private Investment Corporation
Proparco	Société de Promotion et de Participation pour la Coopération Economique
SADEV	Swedish Agency for Development Evaluation
Sifem	Swiss Investment Fund for Emerging Markets
Simest	Società italiana per le imprese all'estero
SMEs	Small and Medium Enterprises
Sofid	Sociedade para o Financiamento do Desenvolvimento
SSA	Sub-Saharan Africa
UN	United Nations
UNCTAD	UN Conference on Trade and Development
US	United States
WDI	World Development Indicators

Executive summary

Introduction

Development Finance Institutions (DFIs) contribute to global development by investing in the private sector. The resources they provide are intended to be additional to what the market can provide and to catalyse further investment. Their shareholders are increasingly expecting DFIs to do more. DFIs have an explicit role in the Addis Ababa Action Agenda on Financing for Development of July 2015 and are expected to provide part of the \$100 billion climate finance agreed in the Paris climate change agreement of December 2015. DFIs are also increasingly important in macro financial terms.

However, despite their increased importance in global debates and developing economies, there is insufficient information to assess how well DFIs are meeting the ever-increasing expectations. DFIs have begun to assess their development impact by looking at project level and only very recently have they started to look beyond project level to develop guidelines to assess indirect effects. But, apart from a few recent studies, there have been no attempts to assess the macroeconomic impact of DFIs. Yet that is what the general public should be interested in: to what extent do DFIs create jobs, raise growth, increase use of renewable energy and crowd in local private sector investment?

This study 1) provides the most complete literature review to date on the macroeconomic effects of DFIs; 2) examines the data graphically and suggests DFIs can play a key role in kick-starting investment and renewable energy use in developing countries; and 3) collects country-specific DFI investment data in sub-Saharan Africa (SSA) and undertakes the most comprehensive econometric analysis of DFIs in SSA.

Reviewing the evidence on the macroeconomic impact of DFIs so far

The literature review covers a number of studies on the macro effects of DFIs, with impact areas encompassing economic growth, investment, jobs, labour productivity, tax revenues, poverty reduction, food security and renewable energy. In some areas, there is hardly any evidence, for example in relation to the direct impact on poverty. However, in other areas we know much more. Consider for example the following summary findings:

- *Economic growth.* A 10% increase in multilateral DFI investments leads to a 1.3% increase in growth in lower-income countries, compared with an increase of just 0.9% in higher-income countries.

- *Investment.* A 1 percentage point increase in DFI investments as a percentage of gross domestic product (GDP) leads to a 0.8 percentage point change in the investment-to-GDP ratio. Using actual DFI investments so far for 26 countries, DFIs have kept investment-to-GDP ratios at least 1.5 percentage points higher than would otherwise have been the case.
- *Labour productivity.* For each percentage point shift in the ratio of DFI investments over GDP, the effect of DFIs on labour productivity is found to be between 3.4% and 7.5% and statistically significant. Using the lower estimate, and plugging in actual DFI data, DFIs have increased labour productivity by at least 3% in 21 low- and middle-income countries. In Ghana, Kenya and Zambia the effects are found to be of the order of 2.3%.

These are powerful findings on the macro contribution of DFIs. The rest of the paper is focused on providing new estimates in SSA. We first consider how much European DFIs are already involved in SSA.

The EDFI portfolio in sub-Saharan Africa

The consolidated portfolio of European DFIs (EDFIs) grew from €10.9 billion in 2005 to €32.9 billion in 2014, which represents an increase of 204%, or 13% per year. Some EDFI members specialised almost entirely in equity and quasi-equity in 2014 (i.e. CDC, SBI and, to a lesser extent, Norfund and Sifem). The majority of the committed portfolio of others (i.e. Proparco, BIO, Cofides and OeEB), on the other hand, is through loans. With the exception of Sofid, most do very little in guarantees. EDFIs as a whole invest mostly in financial services and infrastructure. In 2014, 50% (€16.3 billion) of the total consolidated portfolio was invested in the financial sector (mainly in investment funds and banks); the share invested in infrastructure was equal to 24% (€7.9 billion, of which €5.4 billion in power).

The total value of new EDFI investments in SSA has nearly tripled, from €0.9 billion in 2005 to €2.3 billion in 2014. In 2014, EDFI investments represented 5% of foreign direct investment (FDI) and 7% of aid in SSA. If we also take into account multilateral DFIs (International Finance Corporation (IFC), European Investment Bank (EIB) and African Development Bank (AfDB)), then DFIs' investments represented 16% of FDI and 22% of aid in SSA. Some DFIs are more geared than others towards SSA countries. Swedfund and Sofid invested 64% and 58%, respectively, of their 2014 total portfolio in SSA, followed by Norfund (47%) and Finnfund (44%). It is worth

noting that the total exposure in SSA of 10 out of the 15 EDFI members is higher than that of the multilateral IFC, which in 2014 invested 17% of its committed portfolio in SSA economies.

New empirical evidence

We first provide a number of graphical presentations that illustrate how DFIs' investments appear to be related to increased (private sector) investment in Ghana and Uganda, renewable energy use in Kenya and labour productivity in Swaziland.

We then collect data on DFI-committed investments at country level for SSA. We use these data to estimate the effects of DFIs on macroeconomic variables, and find the following:

- *Economic growth.* The effect of DFI investments on the rate of GDP per capita growth is positive for all DFIs and significant for IFC, DEG, CDC and the Overseas Private Investment Corporation (OPIC). Pooling DFIs, we find a significant positive effect on the GDP per capita growth rate. If the DFI/GDP ratio increases by 1% (which is approximately \$15 billion for the whole of SSA), per capita growth increases by 0.24% on average. This would, however, require a tripling of current levels of DFI investment.
- *Investment.* There is a positive effect of DFIs on gross fixed capital formation (GFCF). This effect is significant for IFC, EIB, OPIC, Norfund and the 'Rest of the DFIs'. Pooling DFIs, we find no significant effect on investment. However, the experience in cases such as Ghana and Uganda suggests DFI investments have pulled new FDI and domestic investment into their economies.

- *Labour productivity.* In general, the effects tend to be small. Only the investments made by the IFC, OPIC and Norfund have had a positive and significant effect on changes in labour productivity. Pooling DFIs, we find a positive and significant effect on labour productivity. If DFI/GDP increases by 1%, labour productivity increases by 0.27% on average.
- *Renewable energy use.* DFI investments have helped increase the use of renewable energy in Kenya, with investments in alternative generation technologies beyond hydro-electrical power.

Key messages

- The portfolio of investments by EDFIs in SSA quadrupled between 2005 and 2014 and amounted to €9 billion in 2014. EDFI investment is equivalent to 5% of foreign direct investment and 7% of aid to SSA.
- DFIs are increasingly expected to contribute to economic growth, economic transformation, investment, poverty reduction, food security and renewable energy use.
- The evidence reveals important positive and significant effects of DFIs on economic growth, investment and productivity. But this evidence is very patchy, limited to specific countries, specific DFIs or estimation techniques.
- DFIs contribute significantly to the achievement of development goals. If the DFI/gross domestic product ratio increases by 1% (or by some €10 billion), per capita incomes increase by, on average, 0.24% and labour productivity by 0.27%.

1. Introduction

Development Finance Institutions (DFIs) contribute to global development by investing in the private sector. The resources they provide aim to be additional to what the market can offer and to catalyse further investment. Typical projects supported by DFIs generate jobs, provide access to finance, promote the use of renewable energy and, in aggregate, contribute to economic growth and hence reduce poverty. Their shareholders are increasing their demands on DFIs. DFIs have an explicit role in the Addis Ababa Action Agenda on Financing for Development of July 2015 and are expected to provide part of the \$100 billion climate finance as agreed in the Paris climate change agreement of December 2015. DFIs are increasingly important in macro terms – for example the invested portfolio of European DFIs (EDFIs) increased from €11 billion in 2005 to €33 billion in 2014.

However, despite their increased importance in global debates, we lack sufficient information to assess how well DFIs are meeting ever-increasing expectations. DFIs have begun to assess their development impact by looking at the project level; only very recently have they started to look beyond this and develop guidelines to assess indirect effects (IFC, 2013; te Velde, 2015). Apart from recent studies by Massa (2011), te Velde (2011) and Jouanjean and te Velde (2013), no studies assess the macroeconomic

impact of DFIs. Yet this is what the general public should be interested in: to what extent do DFIs create jobs, raise growth, increase use of renewable energy and crowd in local private sector investment?

This study addresses the gap in three ways. First, it provides the most complete literature review to date on the macroeconomic effects of DFIs. This provides a range of interesting findings, pointing to a number of positive studies but also highlighting shortcomings. Second, it examines the data graphically and suggests DFIs can play a key role in kick-starting investment and renewable energy use in developing countries. Third, it collects country-specific DFI investment data in sub-Saharan Africa (SSA) and undertakes the most comprehensive econometric analysis of DFIs in the region.

The structure of this paper is as follows. Section 2 reviews the evidence of the impact of DFIs in a range of areas: economic growth and investment, job creation and labour productivity, tax revenues, poverty reduction, food security, service delivery, and climate change mitigation/adaptation and environmental sustainability. Section 3 provides background data on DFIs. Section 4 provides new empirical estimations of the effects of DFIs in SSA, first graphically and then using a range of econometric techniques. Section 5 concludes.

2. The macroeconomic effects of DFIs: a review of the evidence

2.1 Introduction

The core field of activity of multilateral and bilateral DFIs is the financing of private sector projects in developing and emerging economies (Gössinger and Raza, 2011). Their mandates, indeed, reflect the conviction that the private sector plays a crucial role in fostering economic, social and environmental development (see Box 1). DFIs play a key part in fostering development in beneficiary countries by encouraging private sector development investments. Dalberg (2010) argues that, in promoting private sector development, DFIs are guided by three principles (Figure 1):

1. **Additionality:** DFIs invest in countries and sectors where usually commercial investors/banks would not because of the high risks involved.
2. **Catalytic effects:** finance provided by DFIs helps attract and mobilise the involvement of other private investors both directly (i.e. through the mobilisation of other investor capital) and indirectly (i.e. through helping local markets build strong foundations for commercial activity).
3. **Sustainability:** finance provided by DFIs allows country governments to realise projects that foster socioeconomic development, thus reducing dependency on aid.

The section surveys the existing literature on the impacts of multilateral and bilateral DFIs and develops a conceptual framework of the impacts of DFIs. Source papers include professional journal articles, refereed

research studies, policy briefs, DFI and project evaluations and country case studies. Where information is scarce or not available at all, anecdotal evidence is taken into account. Because DFIs are changing fast in today's environment, we use mostly sources published over the past decade, except where articles are needed specifically for their historical relevance and perspective on broad issues relating to DFIs.

Box 1: Mandates of selected DFIs

IFC: 'The purpose of the Corporation is to further economic development by encouraging the growth of productive private enterprise in member countries, particularly in the less developed areas'

Proparco: 'was founded on the belief that the private sector plays a major role in the economic and social development of the South'

OPIC: 'mobilizes private capital to help address critical development challenges'

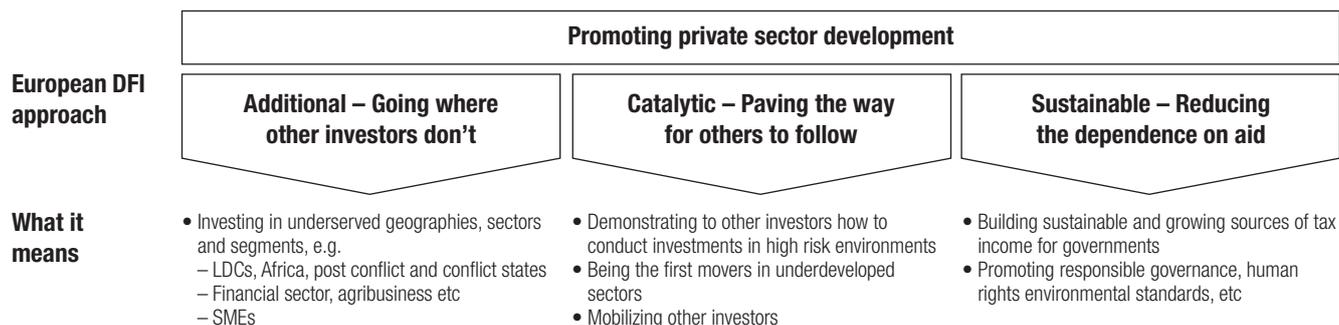
DEG: '... we promote the expansion of the private sector – as the driving force of development'

FMO: 'helps stimulate the private sector. A healthy private sector fuels the economy by... generating lasting development impact'

Note: This is not an exhaustive list. Some examples are provided but there are other DFIs that recognise employment creation as a priority objective.

Source: IFC, Proparco, OPIC, DEG and FMO websites.

Figure 1: DFIs' approach to promoting private sector development



Source: Adapted from Dalberg (2010).

2.2 Channels of development impacts

As mentioned above, the activities and operations of DFIs are closely associated with the concept of private sector development. In what follows, we shed light on some of the key development challenges that DFIs may address by fostering the private sector, thus succeeding in promoting development. In particular, we focus on the following areas of impact:

- economic growth and investment
- job creation and labour productivity
- tax revenues
- poverty reduction
- food security
- service delivery
- climate change mitigation/adaptation environmental sustainability.

2.2.1 Impact on economic growth and investment

The private sector is widely recognised as a critical driver of economic growth. Therefore, by encouraging private sector development, DFIs may promote economic growth. Nevertheless, in the literature there is still a very limited amount of studies that look at the empirical link between DFIs and growth.

Massa (2011) examines the relationship between DFI investments and economic growth in a number of selected economies for the period 1986–2009. The focus of the study is on investments realised by multilateral DFIs, including the International Finance Corporation (IFC), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB), in countries with very different income levels and in different sectors. The study assesses the effects of multilateral DFI investments on growth by distinguishing between income categories of countries (lower-income countries versus higher-income countries) and sectors (i.e. agribusiness, financial sector, industry and infrastructure). It uses the Generalised Method of Moments (GMM) method for panel data analyses.

The results of the quantitative analysis show investments by multilateral DFIs enhance growth: a 10% increase in multilateral DFI investments increases incomes by about 1.5%. However, the magnitude of the impact of DFI investments on growth is not uniform throughout all countries, as it differs depending on the level of income in recipient economies. In particular, multilateral DFI investments have a stronger impact on growth in lower-income than in higher-income countries. Indeed, a 10% increase in multilateral DFI investments leads to a 1.3% increase in incomes in lower-income countries, compared with an increase of just 0.9% in higher-income countries. The findings of the sectoral analysis also show that multilateral DFI investments directed to infrastructure provide the largest impact

on economic growth, followed by investments in the industry and agriculture sectors. A 10% increase in multilateral DFI investments is found to increase growth by roughly 0.8% in the infrastructure sector, 0.4% in the industry sector and 0.2% in the agribusiness sector. Splitting the sample into lower-income countries and higher-income countries highlights that the strategic importance of the considered sectors of investment differs depending on the stage of development of the recipient country. In lower-income economies, multilateral DFI investments in agriculture and infrastructure play the most significant role in promoting economic growth. Higher-income countries, on the other hand, benefit much more from multilateral DFI investments targeting the industry sector in addition to those directed to infrastructure.

Te Velde (2011) examines the evidence of the impacts of DFIs on growth during periods of crisis. In particular, he argues that during (and after) the 2008–2009 financial crisis, the reduction in commercial bank investments in developing countries was, in some cases, replaced by investments from DFIs, which therefore contributed to supporting economic recovery in crisis-affected countries (e.g. the IFC's Infrastructure Crisis Facility). Nevertheless, te Velde (2011) highlights that not all DFIs were able to be counter-cyclical during the global financial crisis. Indeed, while EDFI portfolios increased by 14% in 2009 (compared with 12% in 2008 and 21% in 2007), there was no growth in the case of the IFC (in euros).

The growth-enhancing role of DFIs in periods of crisis is also recognised by Dalberg (2010), who argues that DFIs played an important role in sustaining growth in the developing world, and especially in African countries, during the global financial crisis when these economies were experiencing a dramatic reduction in investments by the private sector. DFIs succeeded in doing this in three ways:

- *Acting counter-cyclically*: while private sector investments fluctuated greatly, DFIs maintained a level of investment similar to that in previous years. EDFIs' African portfolio, for example, increased by about 10% from 2007 to 2008.
- *Back-stopping financial institutions*: DFIs supported the functioning of the private sector by replacing the services of commercial banks, which were driven out by risk factors or liquidity shortages.
- *Acting as stabiliser*: DFIs played a crucial role in stabilising investments in developing countries, through their role as investment partners.

Dalberg (2010) also notes that an additional strength of DFIs in periods of crisis is that they can introduce new products and services quickly to respond to market needs. For example, during the global financial crisis, Norfund was able to quickly approve a €2.7 million loan to the Emergency Liquidity Facility (ELF) to enable Latin American microfinance institutions to better cope with liquidity problems stemming from the crisis. Nevertheless,

Dalberg (2010) highlights a number of factors that made DFIs unable to respond sufficiently to the needs of the market. In particular, certain DFIs were constrained by operational rules on increasing the maximum level of equity participation or on increasing the percentage of total lending to individual projects. Swedfund was able to receive quickly additional capital injections in 2009 to counteract the financial crisis, but it was difficult for most DFIs to get funding for this purpose at short notice. Moreover, multilateral DFIs such as the IFC received additional funding relatively quickly but existing procedures impeded fast disbursements.

On its website, EIB reports that, during the Eurozone crisis, it provided support to economic recovery in Europe through €60 billion in additional lending over the period 2013–2015.¹

Through a systematic review of the literature on DFI infrastructure projects, Spratt and Ryan-Collins (2013) find evidence of DFIs' additionality for growth – that is, of the fact that DFI activities (in infrastructure) support growth. In particular, the authors find DFIs boost economic growth by actively seeking to influence 1) project design and, to a lesser extent, 2) policy features. In other words, DFIs' impact on growth by selecting growth-enhancing projects, such as those that remove or alleviate growth bottlenecks (e.g. constraints on productivity, international trade, physical infrastructure, etc.), generate employment and government fiscal revenues, produce knowledge and technology transfer or mobilise investment in green energy or energy efficiency. Moreover, DFIs affect growth by influencing a country's legal and regulatory framework as well as public sector capacity, although this is more challenging, as most bilateral DFIs do not have a mandate to change these policy features. Spratt and Ryan-Collins highlight that, to maximise DFIs' growth impact, it is important to devote greater resources to project screening and appraisal. Indeed, there is evidence that inadequate understanding of the policy or political context before committing to a project translates into disappointing outcomes for design and policy additionality for growth.

To our knowledge, the above studies are the only existing empirical evidence addressing specifically the relationship between DFIs and economic growth. There are, however, a few papers looking at the impact of DFIs on certain factors such as knowledge and technology transfer, which in the literature are recognised as key mechanisms for economic growth.

Namusonge (2004), for example, investigates the role of three Kenyan DFIs (i.e. the Industrial Development Bank, the Industrial and Commercial Development Corporation and Kenya Industrial Estates) in the transfer of technological capabilities in small and medium enterprises (SMEs) in Kenya – a recognised channel through which DFIs may encourage private sector development and as a consequence, economic growth (IFC, 2011). The method used is to review

reports and interview a selected number of stakeholders (i.e. project officers and top management officials of the considered three DFIs as well as client enterprises), and then analyse qualitatively and quantitatively the collected information to determine the success rates of projects financed by DFIs. The findings of the research show DFIs play an important role in transferring two types of skills: production capabilities (i.e. skills and knowledge needed for operating and improving a plant) and investment capabilities (i.e. pre-investment and project execution skills and knowledge). In particular, it found that, in Kenya:

- 84% of the entrepreneurs acquired *production capability* through financing from the DFIs.
- 74% of the entrepreneurs acquired *investment capabilities* thanks to DFI investments.
- The DFIs did not assist 79% of the entrepreneurs in acquiring *minor change capability* (i.e. ability to improve and continuously adapt a firm's products and processes).

DEG (2016) also shows through various case studies that its investments contribute to developing local skills in the private sector, thus producing substantial benefits for stakeholders (in particular private companies, employees, suppliers, clients and the local community), and having an overall positive impact on local economies:

- In China, DEG has helped HAPE, a toy manufacturer, to develop a standardised training programme for its workforce and wood suppliers. This experience shows how investing in education of the workforce, along the value chain and within the community, can help bridge local skills gaps, with positive long-run effects.
- In India, DEG has supported a German producer of welding machines that established a collaboration agreement with the Don Bosco Centre, an experienced provider of technical vocational courses, in Pune in order to train workers to qualify as service technicians for welding machines. The availability of well-trained service technicians is recognised as a key success factor for market entry in India, and the investment is expected to translate into positive economic and social impacts for the local economy.
- In Bangladesh, DEG supported a producer of leather goods to develop a comprehensive training programme that provides technical training not only for its own production facility but also for two local tanneries. The training was desperately needed, since more than 90% of the suppliers' employees suffer from occupational diseases. The programme helped improve health and safety, with positive impacts on working conditions as well as production.

¹ See <http://www.eib.org/about/index.htm>

A number of DFI (project) evaluations also point to the role played by DFI investments in promoting knowledge and technology transfer. An evaluation of the Industrialization Fund for Developing Countries (IFU) conducted by the Danish International Development Agency (Danida, 2004) reports that ‘human capital investments through training and involvement of local staff and changed management regimes have been key features of the Danish enterprises’ activities’ supported by IFU. ‘Technology transfer, in terms of technical equipment and procedures, transparent and open management principles and corporate governance... as well as quality control and monitoring are mentioned as impacts of the Danish enterprises’.

Moreover, an evaluation of the Least Developed Country (LDC) Infrastructure Fund conducted by the Policy and Operations Evaluation Department (IOB) of the Dutch Development Cooperation Ministry of Foreign Affairs (IOB, 2009) also highlights that construction of the drinking water treatment plant in Sudan financed by the Dutch Development Bank (FMO) enhanced technical skills of local employees at the construction site as well as those of Khartoum State Water personnel.

An evaluation of Swedfund International conducted by the Swedish Agency for Development Evaluation (SADEV, 2008) finds that some type of transfer of knowledge and business practice took place in 21 out of 44 studied investments. For 15 investments, there was insufficient information, while for eight no knowledge or business practice transfer was found. Transfer of knowledge and business practice includes examples of industry specific training as well as more general training in accounting, management, sales and marketing. If a trend can be discerned in this, it is that the larger the company is, the more dedicated it is to these types of activities. It is, however, symptomatic that even companies that have been established in developing countries for many years are often still dependent on expatriate expertise for the management of the company. How much focus there has been on education and knowledge transfer also generally varies substantially between but also within the same sectors.

The evaluation also finds Swedfund’s investments had a smaller impact in terms of technology transfer than in terms of knowledge transfer. Indeed, in just 13 (compared with 21 in the case of knowledge and business practice transfer) of the 44 studied investments some type of technology transfer was found.

An evaluation of Norwegian business-related assistance conducted by the Norwegian Agency for Development Cooperation (Norad, 2010) reports that, in Bangladesh, the company Scancement funded by Norfund introduced new technology (i.e. Portland composite) into the country; this requires less clinker and is therefore cheaper.

An important channel through which DFIs affect growth is by raising gross fixed capital formation (GFCF). Te Velde (2011) argues that DFI support is now equivalent to a quarter of official development assistance (ODA), and

finds there are 26 developing countries where the (average of) IFC, EIB and the UK Development Finance Institution (CDC) together make up between 2% and 12% of total domestic investment. Using standard regression analyses, and based on data for EIB, EBRD, IFC and CDC from 1985 onwards (depending on data availability), he finds DFIs have indeed raised investment (GFCF) in recipient countries compared with the constructed counterfactual. A 1 percentage point increase in DFI as a percentage of gross domestic product (GDP) would lead to a 0.8 percentage point change in the investment ratio. Hence, for 26 countries, DFIs have kept investment-to-GDP ratios more than 1.5 percentage points higher than would otherwise have been the case.

2.2.2 Impact on job creation and labour productivity

The private sector is the major employer and creator of jobs. Indeed, in developing countries, 90% of jobs are in the private sector (World Bank, 2005) and nine out of 10 employment opportunities are created by private enterprises (Runde, 2014). Therefore, by fostering private sector development, DFIs play a critical role in enhancing job creation, which is recognised as one of their top priority objectives and is also used as a key indicator to measure DFIs’ development impact (see Massa, 2013). The Let’s Work initiative has begun to bring DFIs together to measure the impact they have on job creation (te Velde, 2015).

According to Massa (2013), DFIs promote employment through four main channels:

- *Additionality*: by focusing on their mandate on additionality, DFIs help increase the volume of economic activity in a country, and as a consequence create employment.
- *Demonstration effects*: DFIs’ projects can demonstrate the potential of new types of investment, thus leading to further investments by the private sector, which in turn lead to more economic activities and more employment creation.
- *Technical change*: DFIs contribute to knowledge enhancement through a number of channels, including capacity-building and technical assistance, changes in business regulatory environments and the uptake of environmental, social and corporate governance standards in business practices. Such support fosters better managerial and innovation capabilities, which increase firms’ potential to grow and invest in technology and skills, with possible consequent employment opportunities.
- *Forward and backward linkages*: DFIs can support firms’ (e.g. manufacturing firms), which have both forward and backward linkages in an economy – that is, manufacturers need inputs from suppliers (backward linkages) but can also sell their products to distributors

(forward linkages). By supporting growth in these firms, they may produce both forward and backward effects, which in turn will also affect employment.

Through these channels, three types of employment are created:

- *direct jobs*: jobs created within firms supported by DFIs
- *indirect jobs*: jobs created in supplier/distributor companies linked to DFI-supported firms
- *induced jobs*: jobs resulting from increased consumption by direct and indirect employees within DFI-supported firms.

The relevance of these types of jobs created differs markedly by sector. Indeed, Massa (2013) and Jouanjean and te Velde (2013) argue that in the manufacturing sector most of the jobs created by DFI investments are direct jobs, whereas in the tourism and infrastructure sectors indirect and induced jobs, respectively, represent the largest share of jobs created (Table 1).

In the literature, there seems to be a consensus that measuring the precise impact of DFIs on employment creation is a challenging task (see IFC, 2013; Massa, 2013). Several DFIs in their institutional publications report

information on the number of direct and to some extent indirect jobs created in client companies (see Table 2).

Dalberg (2010) highlights that, up to 2010, EDFI member investments had directly led to the creation of around 422,000 jobs and indirectly to about 1.3 million jobs. The study also found that every €1,000 spent on an EDFI member project resulted in the creation of 0.08 direct jobs and 0.27 indirect jobs.

By using a production function approach and assuming DFI investments help to increase GFCF within project countries and that DFI investments cause an increase in GDP, which, in turn, increases employment, Jouanjean and te Velde (2013) estimate the direct and indirect employment effects of 2007 investments of a selected set of DFIs (EIB, CDC, IFC, Proparco, DEG and EBRD) at national level. The results show DFI investments have helped create 2.6 million jobs in over 70 developing countries. The numbers of jobs created have varied among DFIs from 1.3 million by the EIB, 1.2 million by IFC and 0.1 million by CDC, reflecting the amounts invested. The authors also argue that, if DFIs ceased to invest, there would be 2.6 million fewer jobs.

Five case studies on projects financed by the IFC also highlight that DFI investments generate significant direct jobs (mostly skilled) as well as indirect jobs (accounting for a large share of unskilled and semi-skilled jobs compared with direct jobs) (Table 3).²

Table 1: Relevance of DFI impacts on employment creation by sector

Sector of DFI investment	Direct job effects	Indirect job effects	Induced job effects
Manufacturing	Very important	Potentially important	Less important
Tourism	Medium important	Very important	Less important
Infrastructure	Less important	Temporary	Very important
Agriculture	Very important	Less important	Less important

Source: Massa (2013).

Table 2: Direct and indirect jobs supported by selected DFIs in 2014

DFI	Direct jobs	Indirect jobs
Proparco	150,700	97,100
DEG	190,000	653,000
BIO	17,000	70,000
CDC*	533,001	284,000

Note: (*) Figures based on 82% of the projects financed in Africa and South Asia in 2014.

Source: BIO (2014); CDC (2014); DEG (2014); Proparco (2014).

Table 3: IFC case studies – jobs created

	Direct jobs	Indirect jobs	Sector, country
Mriya	2,505	7,390	Agribusiness, Ukraine
PRAN	294	2,198	Agribusiness, Bangladesh
Ecogreen	177	3,646	Chemicals, Indonesia
OCL	293	7,156	Cement, India
Safal	4,200	24,000	Steel, Africa

Source: Adapted from Kumar and Abdo (2012).

² See micro case studies in manufacturing, agribusiness, and services, available at http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/idg_home/job-creation-prelim-findings

Nevertheless, IFC (2013) argues that, in order to estimate DFIs' job creation effects in an economy, besides direct and indirect jobs, other factors should be considered: 1) induced jobs; 2) second-order growth effects; and 3) net job creation.

There is evidence that induced jobs created by DFI-supported firms are significant. For example, a study conducted by Kapstein et al. (2012a) to assess the impact of IFC financing in Ghana found IFC's investments in the country had led to 13,200 induced jobs. In a similar way, Kapstein et al. (2012b) found IFC financing in Jordan created 3,800 induced jobs. In its 2014 annual review, CDC reports that 82% of the projects financed over the year in Africa and South Asia led to 126,000 new induced jobs as workers spend a portion of their wages on local goods and services (CDC, 2014).

Second-order growth effects refer to jobs created thanks to a given DFI investment that help relieve a crucial growth constraint. For example, DFI investments can lead to more reliable power, which allows firms to produce more and more efficiently, thus increasing employment. Two studies attempt to measure second-order growth effects stemming from DFI investments. In particular, a study by Datta et al. (2013) shows the construction of power transmission lines in India and Bhutan by a joint venture company supported by the IFC (Powerlinks Transmission Limited) generated significant second-order growth effects in addition to direct, indirect and induced jobs. It is estimated that, because of increased power supply, 75,000 jobs were generated in six years, while the enhanced reliability of the supply of power led to an additional 1,600 jobs in West Bengal over the same time period.

Moreover, Scott et al. (2013) study the impacts on employment of the Bugoye small hydropower project in Uganda. By using a production function estimated from the most recent World Bank Enterprise Survey data and estimating a multiplier using expenditure and employment data, the authors find second-order growth effects (as well as induced jobs) are more significant than direct and indirect effects.³ Some DFIs are also making an attempt to measure the second-order growth effects of their overall investments. CDC, for example, computes that 388 projects financed in Africa and South Asia in 2014 led to the creation of 843,000 new jobs through increased supply of power and finance (CDC, 2014).

Net job creation refers to jobs created (or expected to be created) minus jobs destroyed (or expected to be destroyed) as a result of a given project in the economy (IFC, 2013). In other words, it accounts for job losses experienced in competing firms during the project. For example, a Food and Agriculture Organization (FAO) and EBRD (2011) study reports that the creation of modern retailers in Poland, Bulgaria and Romania led to job losses in competitors that more than offset the number of jobs created by the creation of the modern retail stores. In a similar way, Basker (2005) finds that, in the US, for every

100 jobs added by introducing modern retail stores, 50 were lost in competing enterprises over the next five years. IFC (2013) highlights that measuring net job creation effects is very difficult since it requires knowing the relative elasticity of the job supply.

Next to investigating the impact of DFI investments on the different types of jobs created, few existing research studies have also focused on assessing the impact of DFIs on the quality of labour (e.g. high labour productivity or labour standards). Jouanjean and te Velde (2013) examine the effects of DFI investments on labour productivity using a panel of 62 developing countries over a period of six to 11 years and implementing various econometric techniques ranging from ordinary least squares (OLS) to panel data and treatment effects methodologies. The study finds a significant effect of DFIs on labour productivity in several regressions using various measures of DFI activity. In particular, using the OLS equation, for each percentage point shift in the ratio of DFIs over GDP, the effect of DFIs on labour productivity is found to be 3.4% and statistically significant. Using the equation that controls for selection bias, the effect is also found to be significant and equal to 7.5%. Using the lower estimate, the authors find DFIs have increased labour productivity by at least 3% in 21 low- and middle-income countries. In Ghana, Kenya and Zambia, the effects are found to be in the order of 2.3%. The treatment effect on labour productivity is found to range between 0 and 15% while the average treatment effect is found to be around 6%.

Ebert and Posthuma (2010) examine the impact of DFIs on the quality of jobs created of 16 global, regional and bilateral DFIs with integrated labour provisions (that is, '(i) any labour standard which establishes minimum working conditions, terms of employment or worker rights, (ii) any norm on the protection provided to workers under national labour law and its enforcement, as well as (iii) any framework for implementation and monitoring of these issues') in their investment policies. The authors started from the observation that, over the past two decades, an increasing number of DFIs (including IFC, OPIC, IFU, FMO, OeEB and DEG, among others) have put in place complex procedures to implement labour provisions in their operations. For example, the IFC enhanced monitoring of client companies to ensure they comply with IFC Performance Standards, or provided technical assistance to boost capacity-building on labour provisions. The study then describes a number of cases in which a positive impact of DFIs' labour policies on working conditions has been found. For example, in the case of a Brazilian airline, IFC's labour provisions helped end anti-union activities (see also Bakvis and McCoy, 2008). Moreover, in the case of a Ugandan construction union, IFC labour policies contributed to making the company apply a collective agreement (see also Murie, 2009). A number of additional successful cases in Nigeria, Nicaragua and Turkey related to IFC's interventions are also reported.

³ See CDC and ODI (2016) for a discussion on the limitations of the studies by Datta et al. (2013) and Scott et al. (2013).

2.2.3 Impact on tax revenues

The private sector is recognised as a crucial provider of tax revenues that governments in developing countries may use to provide vital public goods such as infrastructure, health and education. Therefore, DFIs may have an important impact on taxes by promoting private sector development.

Gathering evidence on the fiscal contributions of DFIs is rather simple since tax revenue is one of the key quantitative indicators several DFIs use to measure their development impact. From a careful analysis of a selected sample of institutional publications of different DFIs, it emerges that empirical evidence points to a significant impact of DFIs on tax revenues:

- BIO states that projects approved in 2014 contribute around €2.3 million in government revenues thanks to direct investments in SMEs and infrastructure (BIO, 2014).
- DEG claims its projects generated €663 million in 2014 (DEG, 2014).
- Proparco states that its 2014 investments will generate €537 million in additional government tax revenues per year (Proparco, 2014).
- CDC reports that in 2014 \$2.34 billion in tax revenues were generated by financed projects in Africa and South Asia (CDC, 2014).

Different types of sources in the literature seem to confirm DFIs' positive impact on government revenues. Indeed, a case study on the OLKARIA III project in Kenya, which was funded by DEG jointly with other partners and aimed at expanding capacity of the geothermal power plant, reveals that DFIs' investments generated €5 million through tax revenues and royalties – a notable amount given Kenya's budget deficit of -3.5% of GDP (Dalberg, 2010). Moreover, a 2004 evaluation of IFU highlights that the financed projects lay the basis for improved government revenues (Danida, 2004). A paper by Wetherill (2010) sheds light on the role of DFIs not only in increasing tax revenues but also in improving the management of such incomes. According to the author, this is particularly true and relevant in oil countries, where DFIs have the power to alleviate the issue of the resource curse by providing technical assistance.

Notwithstanding the successes described above, some research studies in the literature stress that the potential of DFIs to raise tax revenues is threatened by the fact that these institutions often support investments routed through secrecy jurisdictions, thus leading to significant losses of tax revenues to developing countries (see, among others, Bracking et al., 2010 and Kwakkenbos and Romero, 2013). Vervinck (2014) looks at investments of three multilateral DFIs and 14 bilateral DFIs, and reports that:

- At the end of 2013, 75% of CDC fund investments went through tax havens. Between 2000 and 2013 these amounted to \$3.8 billion.

- At the beginning of June 2014, more than 70% of BIO's investment funds were domiciled in secrecy jurisdictions. These amounted to \$207 million.
- At the end of 2013, 28% of Norfund's investments were channelled through tax heavens. These amounted to \$339 million.
- At the end of 2012, at least 15% of DEG's investments were channelled through tax havens.

Vervinck also highlights that most DFIs have adopted internal standards on the use of tax havens but these policies are not ambitious enough since they rely heavily on the ratings put forward by the Organisation for Economic Co-operation and Development (OECD) Global Forum on Transparency and Exchange of Information for Tax Purposes, which appear to have severe limitations. Moreover, DFIs' due diligence procedures usually do not require their investee companies to report on a country-by-country basis on taxes paid and other indicators of economic performance, and most DFIs feature a severe lack of portfolio transparency. Of course, DFIs need appropriate tax jurisdictions to leverage private sector capital, and forcing other routes may ultimately mean fewer investments and lower tax revenues.

2.2.4 Impact on poverty reduction

Increased private investment is often associated with declining rates of poverty, but the effects are often indirect. Although the mission statements of several multilateral and bilateral DFIs claim helping people to escape poverty and improve their lives is a priority of their investments, Spratt and Ryan-Collins (2013) undertake a thorough literature survey on infrastructure investments and find little evidence to support the proposition that DFIs seek to influence project design and the policy context to increase direct poverty impacts. Indeed, among the 86 priority studies covered, just four examples were found of evidence of DFI projects resulting in direct poverty reduction outcomes, and all were funded in part by non-commercial financing. Moreover, none of the reviewed studies suggested that DFIs 'are actively engaged with public sector capacity building with respect to poverty reduction, or that they aim to influence policy so as to: (i) Encourage pro-poor institutional and regulatory reform; (ii) Support the engagement of poor and vulnerable stakeholders during project planning' (ibid.)

These findings are in line with the outcomes of an evaluation of 481 IFC projects over the period 2000–2010 conducted by IEG (2011). This finds that only 13% of the reviewed projects had objectives with an explicit focus on poor people, and 87% of these included interventions that engaged poor people directly through employment or provision of goods and services. Moreover, just 14% of the assessed projects included mechanisms for targeting poor people directly, mainly geographic targeting mechanisms (i.e. targeting project outputs to areas where poor people live).

Lemma (2015) and Spratt and Ryan-Collins (2013) provide a possible explanation for the limited focus by

DFIs on their impact on poverty. According to these authors, it is challenging for DFIs to deliver direct poverty impacts since their mandates, financial structure and skills are not designed to enable this.

It is worth noting, however, that the indirect effects of DFIs can be considerable. DFI investments for specific projects can lead to employment creation and as a consequence, to positive impacts on poverty. Dangelmaier (2012), for example, assesses the impact of a DEG project company in China that cultivates organically grown rice, freeze-dried organic vegetables and organic fruits, and claims the 'project company contributes to eradicating poverty (MDG 1) through the creation of approximately 500 new jobs'. Nevertheless, it should be noted that it is not always the case that employment creation contributes to poverty reduction (Bortes et al., 2011). Indeed, the creation of highly skilled jobs in poor countries with a low-skilled labour force may have minimal effects on poor people. Moreover, the jobs created by DFIs' investments may not benefit the poor because of significant rigidities in labour markets in developing economies. In some of their project assessments, DFIs also do not look specifically at incomes resulting from jobs created through their investments, making it even more difficult to assess the contribution of employment to poverty reduction.

2.2.5 Impact on food security

In the context of high and volatile food prices, growing demand for animal protein and biofuels, increasing water scarcity and constrained food trade, food security has become a key global challenge. Given that it is the private sector that produces, processes and distributes most of the food consumed in the world, DFIs can play a key role in enhancing food security by encouraging private sector development.

Empirical evidence on DFI impacts on food security is provided mainly in the form of case studies. For example, the EBRD (2011) reports that the Private Sector for Food Security Initiative (launched in 2011) facilitates private sector investment in order to increase food production by enabling a better business environment through policy dialogue, technical assistance and global coordination. Moreover, in 2010, the EBRD provided finance and technical assistance to Georgian enterprises and the result was that harvested volumes almost doubled compared with the previous year, and the cost of production decreased (ibid.).

In its annual review, CDC (2014) reports a number of country case studies showing the successful impact of the DFI on food security:

- In Sierra Leone, affected by the Ebola crisis, CDC together with Standard Chartered provided new loans to local trading companies involved in the import and distribution of key food staples (e.g. rice, flour, sugar, cooking oil and beverages, etc.), thus playing a critical role in supporting food security in the country.
- In 2013, in Nigeria, CDC provided a loan facility to support the development of a new urea-based fertiliser

plant. Next to other positive impacts, this investment is expected to improve farm yields and agricultural productivity, which are critical to Nigeria's long-term food security.

There is also evidence of positive effects of IFC investments on food security. The IFC (2015) reports that:

- In Kenya, a \$7 million loan helped Vegpro Group increase its production by buying fruit and vegetables from 4,000 small-scale farmers, thus enhancing food security in the region.
- In Brazil, IFC's financing to Asa Alimentos helped the poultry and pork producer enhance its production capacities, thus increasing food availability for 3.5 million people by 2017.
- In Mexico, a \$10 million loan helped Acuagranjas Dos Lagos expand its fish farming and processing operations, thus helping address increasing demand for tilapia in Mexico and in global markets, and reducing pressure on wild fish stocks amid three decades of steadily growing global fish consumption.

In addition to the case studies, a study by Faye et al. (2013) assesses the impacts of DFI investments in the agribusiness sector in Africa on food security. In particular, the authors argue that large-scale agribusiness projects in African countries are likely to reduce the amount of land available for small-scale farmers, and, given the continent's low agricultural productivity per land unit, reduced access to land will translate into lower agricultural output, with severe implications for food security. The situation is worsened because recent increases in food prices have increased the vulnerability of many African households to food insecurity. According to Faye et al., DFI investments may have a positive impact on food security by enhancing local crop productivity through training provided to local farmers and the introduction of high-yield varieties and fertilisers. In such a way, they may foster local production even if farmers have small lots of land. This approach was applied to the Addax Bioenergy Project in Sierra Leone financed by the African Development Bank (AfDB). The project involved the cultivation of sugarcane using 10,000 ha of land for the production of ethanol and therefore it could have threatened farmers' access to land. In order to overcome this potential negative consequence, the project promoted the introduction of high-yield rice varieties and the creation of farmer field schools, with the objective of improving farmer skills in the use of modern inputs such as fertilisers and in compost-making. Thanks to this, local food security was protected.

2.2.6 Impact on service delivery

The private sector plays a key role in providing essential services such as infrastructure, health, education and finance. World Bank President Jim Yong Kim claimed that, without private sector investment, ODA 'won't fund the critical investments needed... to meet developing

countries' growing infrastructure needs' (Jim, 2013). Therefore, by fostering and leveraging private sector investment, DFIs contribute to enhancing the provision of essential services in the developing world.

A thorough systematic literature survey conducted by Spratt and Ryan-Collins (2013) confirms that DFIs may help enhance the provision of infrastructure, particularly in low-income countries (LICs) and in less commercially attractive sectors, through financial additionality and to a lesser extent through demonstration effects. Indeed, according to the authors, DFIs are able to:

- (a) supply long-term finance, which is often essential for infrastructure but frequently unavailable in LICs;
- (b) mitigate project risk, particularly in the early stages, thus leveraging additional finance by improving the attractiveness of deals (again, this is often crucial in LICs); and
- (c) provide and leverage finance counter-cyclically, either lending when private investors will not, or retaining positions when the private sector would pull out (this is less likely in good times).

Moreover, the authors highlight that DFIs can leverage private sector investments in the infrastructure sector by providing an example of success (demonstration effects). However, the existing evidence on DFIs' demonstration effects is rather limited, given the too recent introduction of DFIs' impact evaluation systems as well as the difficulty of proving causality. It is also highlighted that demonstration effects are complicated because private investors do not enjoy the same advantages that make it possible for DFIs to realise their investments (e.g. to borrow and lend on highly favourable terms).

The importance of DFIs in providing the much-needed infrastructure in developing countries is stressed in a keynote speech by Governor of the Central Bank of Nigeria, Sanusi Lamido Sanusi (2012). This highlights that Nigeria requires over \$10 billion annually over the next 10 years to fill the infrastructure gap; looking at the experience of DFIs in India and Brazil, the governor argues that DFIs in Nigeria may play a key role in responding to the country's infrastructure needs but they need to be granted operational autonomy, as well as to improve corporate governance and business models, increase capitalisation and enhance capacity building. This is in line with the findings of the study by Bolaji Adesoye and Abdulmalik Atanda (2012).

Moreover, Wetherill (2010) sheds light on the financial additionality potential of DFIs operating in the oil and gas upstream infrastructure sector in Africa. In particular, the author argues that, in a sector characterised by the participation of several different investors, DFIs can produce the greatest impacts by investing in selected projects with higher risks and higher development returns – namely, projects in emerging producer countries (e.g. Ghana, Sierra Leone and Uganda, among others) and projects sponsored by smaller, independent and indigenous firms operating in emerging or established producer countries.

Several country case studies reported by the different DFIs seem to confirm that DFIs play a key role in providing services ranging from infrastructure to health, education and finance in developing countries. Covering the results of these numerous case studies is beyond the scope of this paper. Therefore, we refer the interested reader to the DFIs' institutional publications (e.g. annual reports) and websites for detailed information on the outcomes of the case studies.

Nevertheless, existing evaluations of DFIs/DFI projects lead to more mixed results in terms of the impact of DFIs on service delivery. For example, an evaluation of 12 projects (three in Bangladesh, four in Tanzania, two in Mozambique, one each in Benin, Togo and Sudan) supported by the FMO's LDC Infrastructure Fund reports that in six cases the fund did not have a catalytic impact and in four cases it was also not additional (IOB, 2009). For the other cases, the assessment of the catalytic and additionality impact was positive, meaning the intervention of FMO through the LDC Infrastructure Fund made possible projects that otherwise would not have been financed. Moreover, a 2008 evaluation of Swedfund finds that the considered investments did not contribute to the development of financial markets, but quite a few of them have played a key role in developing new infrastructure, such as a road, a port and cold storage facilities (SADEV, 2008).

2.2.7 Impact on climate change mitigation/adaptation and environmental sustainability

Climate change is one of the greatest threats the world is facing, and large amounts of financial resources are needed to respond to this challenge. The Global Commission on New Climate Economy (2015) estimates that total investments needed to adapt to climate change range from \$300 to \$400 trillion for the coming 15 years. The private sector is crucial for successful climate change mitigation and adaptation initiatives, since it may support businesses that follow new paths of energy efficiency, develop new technologies for decreasing the carbon footprint and contribute to the creation and use of adequate environmental technologies. By encouraging private sector development, DFIs may help address climate change issues and promote environmental sustainability.

According to Cochran et al. (2015a), DFIs can have an impact on climate change mitigation/adaptation and environmental sustainability through three channels:

1. Supporting low-carbon, climate-resilient development models: DFIs can encourage and facilitate the shift of public and private investments towards low-carbon, climate-resilient projects, as well as foster changes in regulatory frameworks. More precisely, DFIs can play a crucial role by:
 - a) facilitating access to capital and overcoming market failures
 - b) assisting in developing national, regional and local development strategies and regulatory frameworks coherent with a low-carbon transition

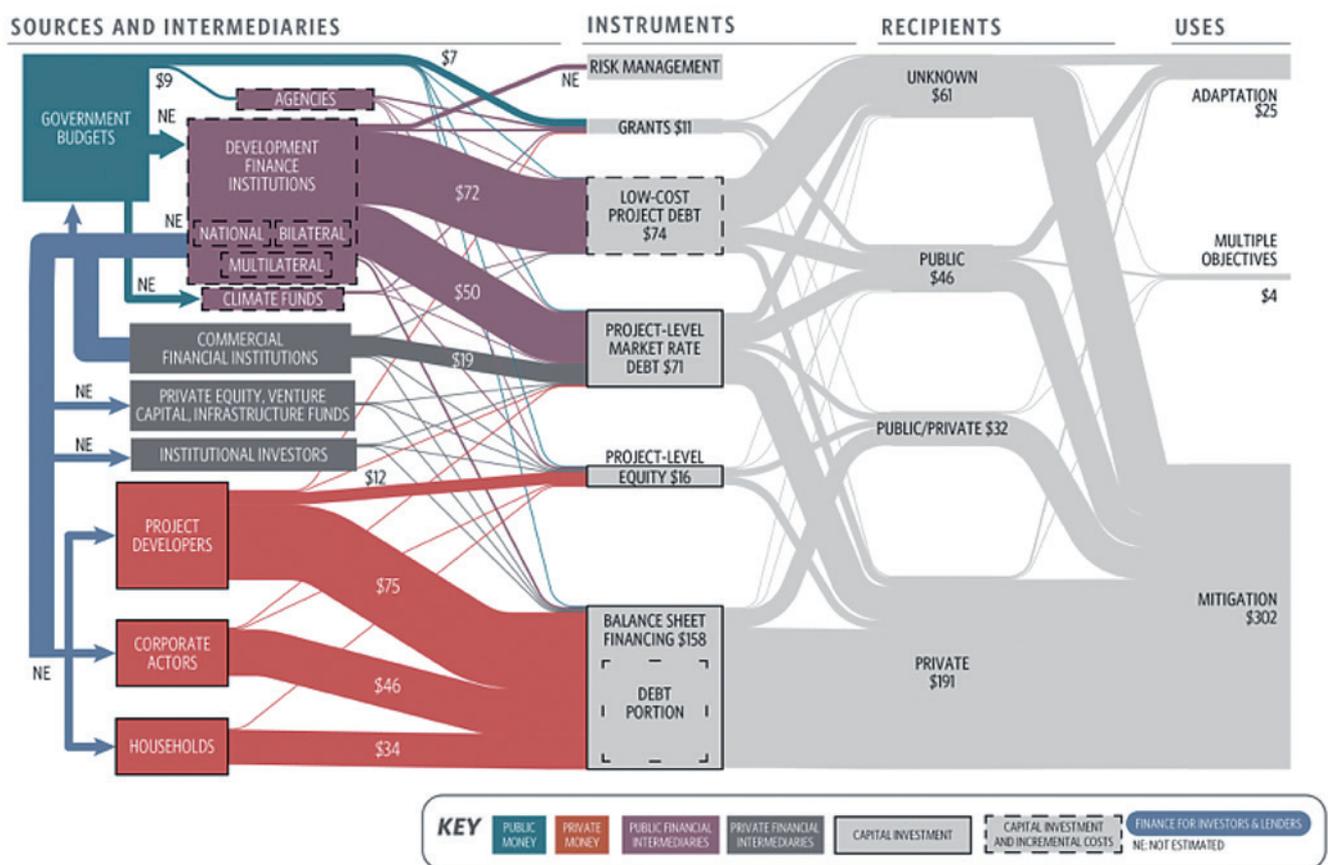
- c) working with local banks and financial institutions in the establishment of green credit lines.
2. Mainstreaming adaptation: DFIs can contribute to ensuring climate risks are systematically taken into account in investment decisions and that adequate adaptation measures are undertaken.
 3. Integrating financial risk and appropriately valuing investments: DFIs can play a role in improving the integration of climate (physical) and carbon (regulatory) risks into investment decision-making and selecting investments.

Empirical evidence shows DFIs are key in facilitating global public climate finance flows. Cochran et al. (2015b) report that, in 2013, DFI climate financing (i.e. financing provided by international multilateral and bilateral institutions as well as by national development finance institutions) amounted to \$126 billion (38% of total climate finance flows). This is in line with numbers reported by the Climate Policy Initiative (CPI, 2014), as shown in Figure 2.

Moreover, a 2015 report authored by the European Development Finance Institution members (EDFI, 2015) highlights that, over the period 2009–2014, EDFI climate financing quadrupled, moving from €517 million in 2009 to €2,167 million in 2014, for a cumulative total of €6,174 million. A total of 31% of this amount was directed to hydropower projects, 18% to wind, 11% to solar, 6% to bio-fuel/mass and 2% to geothermal projects.

In the literature, the evidence on impacts of DFIs on climate change and environmental sustainability is provided mainly in the form of assessments of specific projects and initiatives through case studies, and information is spread among DFIs’ institutional publications and websites. For example, EDFI (2015) reports that the Interactive Climate Change Facility established by EDFI members in 2011 to finance renewable energy and clean energy projects has contributed to reducing carbon emissions by almost 2 million tonnes per year and installing 1,147 MW of additional renewable energy capacity. Moreover, the \$55 million investment by Proparco to finance the expansion of Azito Energie, a thermal power plant in Côte d’Ivoire, is expected to meet roughly half of Côte d’Ivoire’s power consumption

Figure 2: Climate finance flows, 2013



Source: CPI (2014).

needs, reducing greenhouse gas emissions annually by approximately 400,000 tonnes of CO₂.⁵ The DEG's \$18.5 million investment will fund the expansion of the Solar Park La Huayca in Chile, which will increase production capacity from 1.4 MW to 30.5 MW, thus avoiding emissions of 24,500 tonnes of CO₂ per year compared with power generation with conventional technologies.⁶ Furthermore, the IFC Cleaner-Production Initiative in Bangladesh, which aims to make the country's garment industry more sustainable and globally competitive, helped textile factories save \$1 million and reduce water consumption by 75 million litres.⁷

A number of studies have assessed the impact of DFIs on climate change and environmental sustainability. Some examine the environmental impacts of environmental (and social) standards and related procedures promoted by DFIs in their funded projects. Wetherill (2010), for example, finds evidence of positive impacts on the field of environmental (and social) standards introduced in projects in the oil and gas sector in Africa, such as those promoted by IFC in the Tullow Oil project in Ghana. An evaluation of IFC's activities conducted by IEG (2007) also finds that companies funded by the IFC that adopted environmental (and social) standards were more likely to deliver sustainable environmental (and social) impacts. The evaluation of the LDC Infrastructure Fund conducted by IOB (2009) finds evidence of positive environmental impacts of DFI investments in renewable energy. In particular, the assessed Mtwara/Artumas integrated gas to power project in Tanzania funded by FMO is found to have led to a CO₂ reduction of 784,000 MT per year.

Research studies assessing DFIs' impacts on climate change at the macro level are almost nonexistent. To our knowledge, there is just one study of this type, conducted by te Velde (2011), which examines the impact of energy efficiency projects funded by a selected sample of DFIs. In particular, the author runs regressions on the effects of DFIs on energy efficiency, expressed as energy use (kg of oil equivalent) per \$1,000 GDP (constant 2005 purchasing power parity). His results show IFC and EBRD are leading to greater energy efficiency, while there are no such effects for EIB and CDC for the particular sample.

Notwithstanding the successful achievements reported above, Cochran et al. (2015a) stress that, in order to allow DFIs to fully address climate change issues and promote environmental sustainability, it is important to:

- reduce the dependence of DFIs' operations on policy orientations
- enhance coordination in climate initiatives between donor and recipient governments
- enhance concerted and coordinated action between DFIs at the local level to avoid counterproductive competition and overlapping.

2.2.8 Conclusions

The literature review has covered a number of studies on the macro effects of DFIs, ranging from economic growth to investment, jobs, labour productivity, tax revenues, poverty reduction, food security and renewable energy. While in some areas there is close to no evidence of the impacts of multilateral and bilateral DFIs, such as in relation to the direct impact on poverty, in other areas we know much more. Consider, for example, the following summary:

- DFI investments have a positive and significant impact on economic growth, especially in lower-income countries, where a 10% increase in DFI investments is found to lead to a 1.3% increase in growth. This implies DFIs are an important engine for growth in poor economies, and therefore they may play an important role in sustaining growth in periods of crisis when private sector investments experience dramatic contractions, as was the case during the global financial crisis and Eurozone crisis.
- Channels through which DFIs affect growth in beneficiary countries include knowledge and technology transfer, as well as investment. Indeed, several DFI investments are found to contribute to developing local skills and to keeping investment-to-GDP ratios at levels significantly higher than would otherwise have been the case. A 1 percentage point increase in DFI as a percentage of GDP leads to a 0.8 percentage point change in the investment-to-GDP ratio. Using actual DFI so far for 26 countries, DFIs have kept investment-to-GDP ratios at least 1.5 percentage points higher than would otherwise have been the case.

5 http://www.proparco.fr/Accueil_PROPARCO/notre-action/PageCacheeAnte2011/Tous-les-projets/financer-l-efficacite-energetique-en-cote-d-ivoire

6 https://www.deginvest.de/International-financing/DEG/Presse/Pressemitteilungen/Pressemitteilungen-Details_181120.html

7 <http://ifcext.ifc.org/IFCExt/Pressroom/IFCPressRoom.nsf/0/3F39F8701FDB88378525792C004BBC1E>

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- DFIs play a critical role in enhancing both the quantity and the quality of jobs. DFI investments create direct, indirect and induced jobs; increase employment by helping relieve crucial constraints on firms' production (e.g. limited power supply); and increase labour productivity – for each percentage point shift in the ratio of DFIs over GDP, the effect of DFIs on labour productivity is found to be between 3.4% and 7.5%. Using the lower estimate, and plugging in actual DFI data, DFIs have increased labour productivity by at least 3% in 21 low- and middle-income countries. In Ghana, Kenya and Zambia, the effects are found to be of the order of 2.3%. There is also evidence of a positive impact of DFIs' labour policies implemented in their investment operations on working conditions in beneficiary countries.
 - DFIs have a significant positive impact on government revenues, which in developing countries are essential to provide vital public goods such as infrastructure, health and education.
 - DFIs play a key role in enhancing food security as well as in providing essential services such as infrastructure, health, education and finance in developing countries.
 - DFIs can exert positive effects on climate change mitigation/adaptation and environmental sustainability, for example by facilitating the shift of investments towards low-carbon, climate-resilient projects and ensuring climate risks are taken into account in investment decisions and adequate adaptation measures are undertaken.

In the rest of this paper, we collect and describe relevant data for DFIs and examine the country-level impact of their investments.

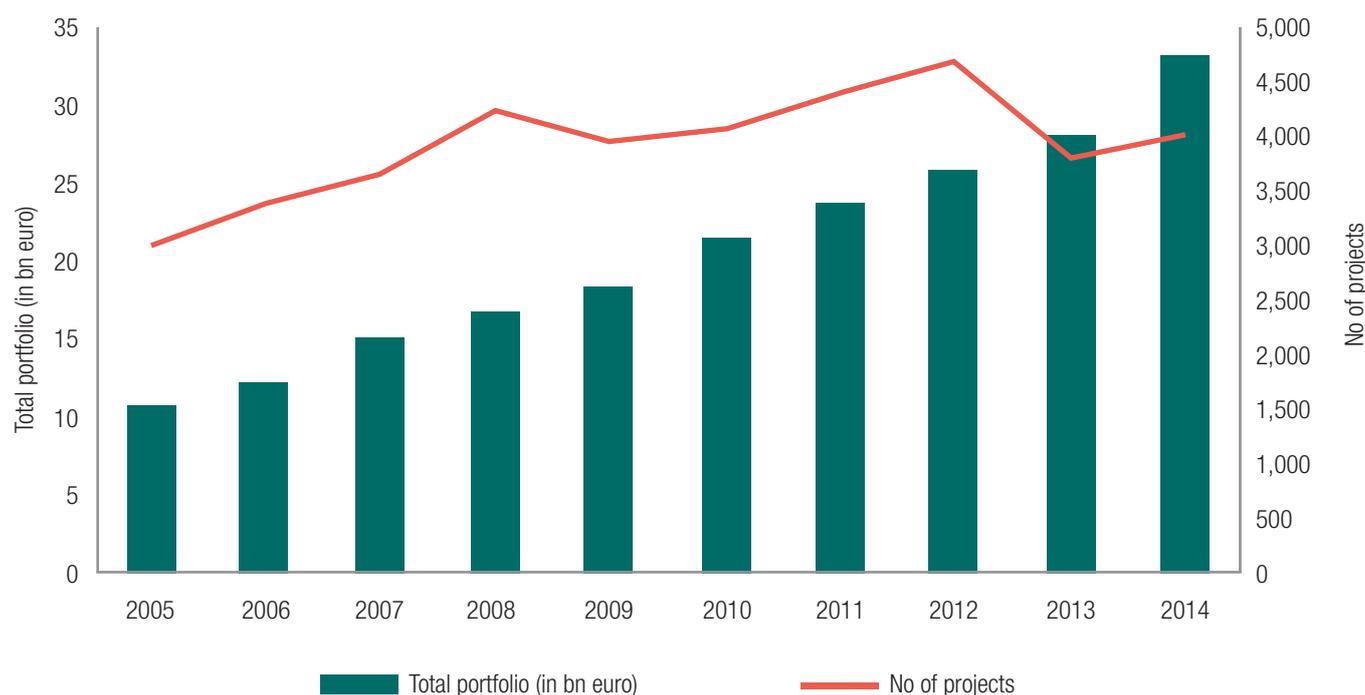
7 <http://ifcext.ifc.org/IFCExt/Pressroom/IFCPressRoom.nsf/0/3F39F8701FDB88378525792C004BBC1E>

3. Description of EDFI activities

As we have seen, DFIs affect global development in many ways. We now turn to describe the activities of EDFI with a view to examining their relevance. EDFI's consolidated portfolio has experienced sustained growth over the past decade, reaching €32.9 billion in 2014, which represents an increase of €22 billion (204% overall, or 13% per year) compared with 2005 (Figure 3).⁸ EDFI's number of projects has also grown steadily from about 3,000 in 2005 to more than 4,000 in 2014, although in recent years there have been some declines, possibly as a result of the 2008–2009 global financial crisis and the more recent Eurozone crisis. Indeed, the number of projects fell by 6% in 2009 and even more remarkably by 24% in 2013.

EDFI uses different investment instruments ranging from loans to equity/quasi-equity and guarantees. As shown in Figure 4, in 2005 EDFI members used mainly loans for their investments. Indeed, 52% of the consolidated portfolio was invested in loans, compared with 41% in equity and quasi-equity and 7% in guarantees. While guarantees have always represented the smallest share of EDFI's committed portfolio over the period 2005–2014, investments in equity and quasi-equity have increased steadily since 2006 and now surpass loans. In 2014, 50% of the consolidated committed portfolio was through equity and quasi-equity.

Figure 3: EDFI portfolio and number of projects, 2005–2014



Note: Number of projects on right-hand axis.
Source: Authors' elaboration on data provided by EDFI.

⁸ Figures are based on all the 15 EDFI members: BIO, CDC, Cofides, DEG, Finnfund, FMO, IFU, Norfund, OeEB, Proparco, SBI, Sifem, Simest, Sofid, Swedfund.

Figure 4: Distribution of EDFI portfolio by financial instrument, 2005–2014



Source: Authors' elaboration on data provided by EDFI.

There is a certain degree of heterogeneity among the 15 EDFI members in terms of financial instruments used (see Table 4). Some members specialise almost entirely (although not exclusively) in equity and quasi-equity in 2014 (i.e. CDC, SBI and to a lesser extent Norfund and Sifem). The majority of the committed portfolio of others (i.e. Proparco, BIO, Cofides and OeEB) is through loans. On the other hand, with the exception of Sofid, most do very little in guarantees. It is worth highlighting that investments by multilateral DFIs (i.e. IFC and EBRD) through equity and quasi-equity are significantly smaller compared with those of most of their bilateral counterparts. Moreover, guarantees still represent the second most used financial instrument of some multilateral DFIs, such as IFC.

EDFI members invest in a wide variety of sectors, ranging from the financial sector to infrastructure, agribusiness, industry/manufacturing and services (Figure 5). EDFI as a whole invests mostly in financial services and infrastructure. In 2014, 50% (€16.3 billion) of the total consolidated portfolio was invested in the financial sector (mainly in investment funds and banks); the share invested in infrastructure was equal to 24% (€7.9 billion, of which €5.4 billion was invested in power).

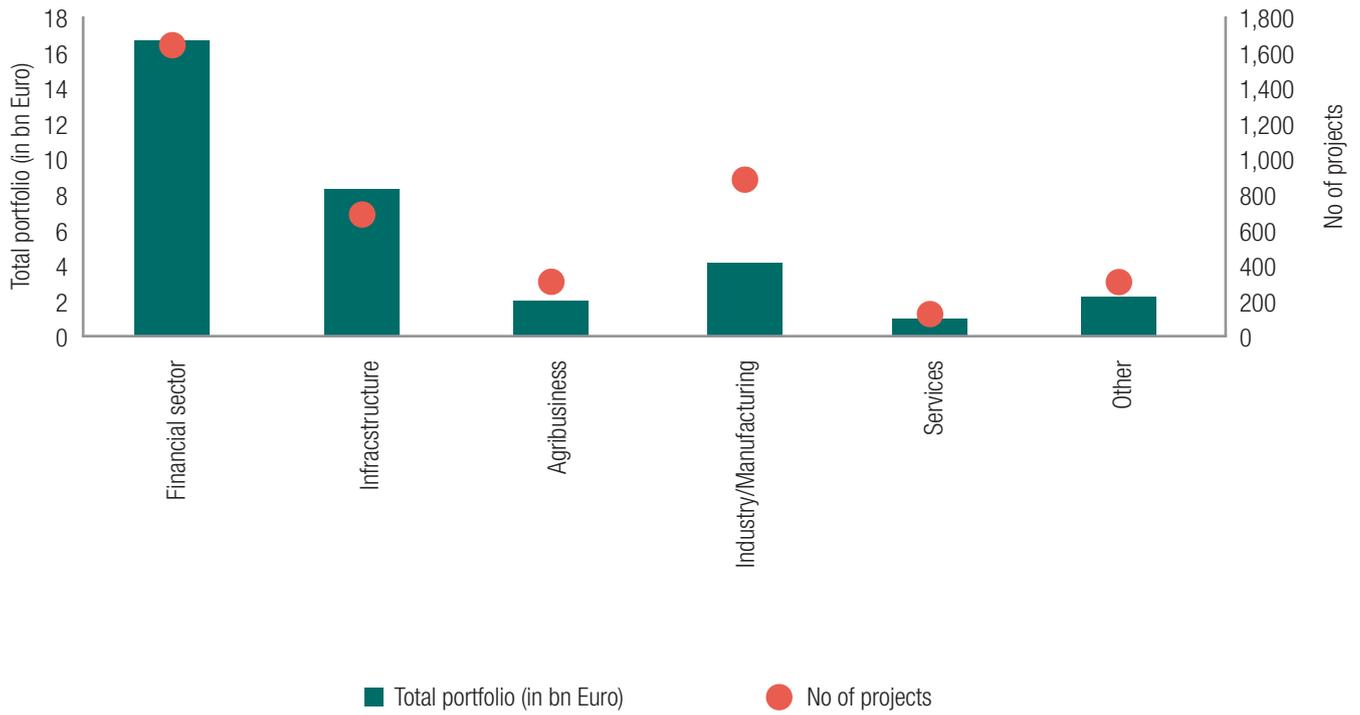
Table 4: Distribution of DFIs' portfolios by financial instrument, 2014

DFI	Quasi & equity	Loans	Guarantees
BIO	30%	70%	0%
CDC	92%	5%	3%
Cofides	34%	66%	0%
DEG	46%	54%	0%
Finnfund	62%	38%	0%
FMO	41%	55%	4%
IFU	61%	38%	1%
Norfund	84%	15%	0%
OeEB	23%	64%	13%
Proparco	17%	82%	0%
SBI	92%	8%	0%
Sifem	84%	16%	0%
Simest	56%	44%	0%
Sofid	0%	40%	60%
Swedfund	57%	42%	1%
Multilateral DFIs			
IFC*	13%	44%	42%
EBRD**	18%	72%	0%

Notes: (*) distribution of IFC's 2014 commitments; (**) distribution of EBRD's 2014 gross disbursements.

Source: Authors' elaboration on data provided by EDFI.

Figure 5: Distribution of EDFI portfolio by sector, 2005–2014



*Note: Number of projects on right-hand axis.
Source: Authors' elaboration on data provided by EDFI.*

Table 5: Distribution of DFIs' portfolios/commitments by sector, 2014

DFI	Financial sector	Infrastructure	Agri-business	Industry/ manufacturing	Services	Other
Bilateral DFIs						
BIO	64%	23%	6%	5%	0%	1%
CDC	93%	3%	1%	1%	2%	0%
Cofides	5%	43%	10%	35%	7%	0%
DEG	46%	22%	4%	20%	2%	8%
Finnfund	37%	32%	11%	18%	1%	0%
FMO	37%	34%	7%	5%	0%	17%
IFU	19%	20%	17%	35%	0%	9%
Norfund	37%	57%	6%	0%	0%	0%
OeEB	75%	21%	2%	1%	0%	1%
Proparco	54%	30%	7%	3%	5%	0%
SBI	0%	4%	33%	52%	7%	3%
Sifem	100%	0%	0%	0%	0%	0%
Simest	0%	7%	6%	73%	9%	4%
Sofid	0%	0%	8%	37%	55%	0%
Swedfund	37%	29%	1%	29%	0%	4%
Multilateral DFIs (commitments)						
IFC	20%	14%	6%	6%	--	--
AfDB **	18%	56%	11%	1%	--	--
EBRD	31%	24%	--	26%	--	--
EIB (external)	41%	59%	--	--	--	--

Notes: (*) Bank Group loan and grant approval by sector in 2014; (--) not applicable/information not available.

Source: Authors' elaboration on data provided by EDFI. Annual or financial reports of IFC, AfDB, EBRD and EIB.

Individual DFIs have developed specific areas of expertise, as shown in Table 5. Among the bilateral EDFI members, Sifem invests exclusively in the financial sector, which is also the largest area of activity of CDC. Infrastructure is the main area of activity for Cofides and Norfund, whereas Simest and SBI operate mainly in industry and manufacturing. Agribusiness is the second largest area of activity for SBI. Sofid is the only institution to focus mostly on services. For the multilateral DFIs, infrastructure and the financial sector appear to be the two key areas of activity. EIB and AfDB direct the majority of their investments to infrastructure, whereas EBRD focuses mainly on providing financial access to the private sector.

In terms of geographical distribution, in 2014 a large share of EDFI's portfolio was invested in African, Caribbean and Pacific (ACP) countries (including South Africa), which represented about 30% of the total consolidated portfolio, followed by South Asia (13%) and South America (11%) (Figure 6). Moreover, ACP countries were also those that experienced the greatest increase in EDFI's allocated portfolio (€6.9 billion) compared with 2005, followed by South Asia (€3.6 billion).

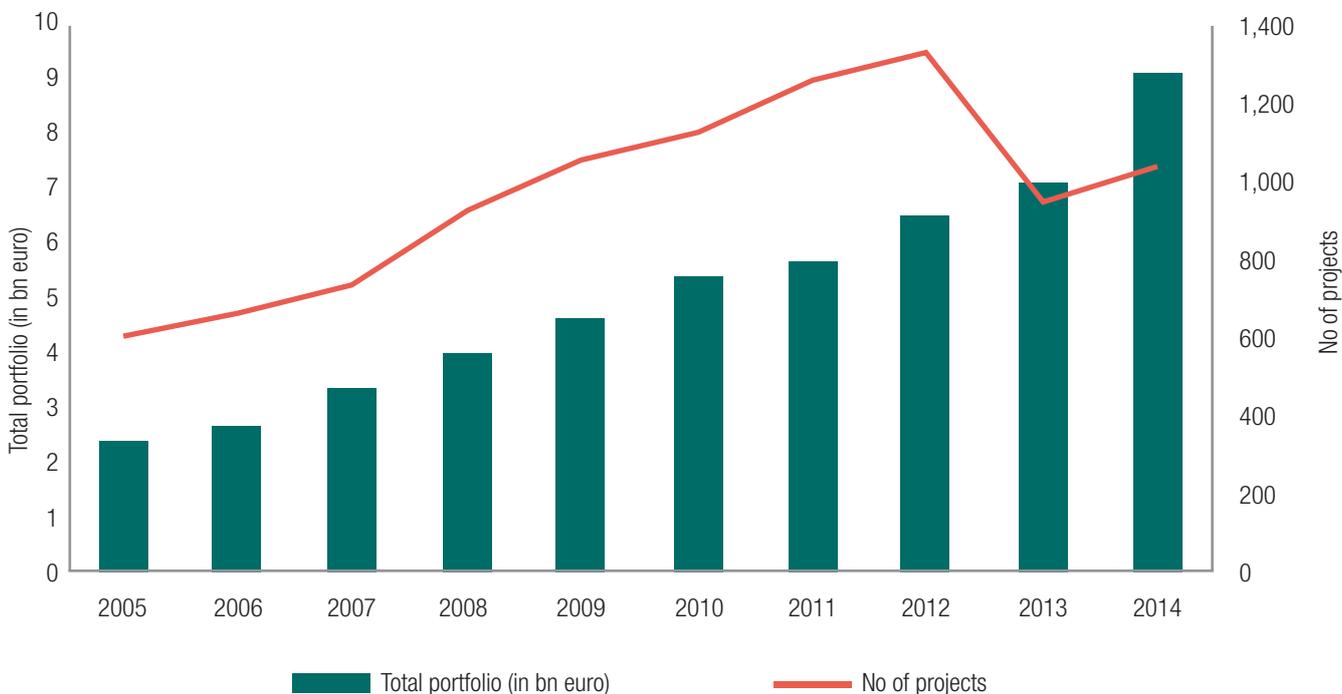
In 2014, among ACP countries, SSA economies were the main beneficiaries of EDFI's portfolio. Indeed, in 2014, EDFI's allocation to SSA countries amounted to almost €9 billion, four times the value in 2005 (€2.4 billion) (Figure 7). The largest share (67%) of EDFI's total portfolio invested in SSA was allocated by FMO, Proparco and CDC. In 2014, SSA's share of EDFI's portfolio represented about 27% of the EDFI's consolidated portfolio (compared with 21% in 2005), thus representing the largest regional share in EDFI's total portfolio. Notably, the number of projects continued to increase in 2008–2009 notwithstanding the global financial crisis, but experienced a decline of more than 40% in 2013, at the time of the Eurozone crisis.

Figure 6: Distribution of EDFI portfolio by geographical region, 2005 and 2014



Source: Authors' elaboration on data provided by EDFI.

Figure 7: EDFI portfolio and number of projects in SSA, 2005–2014

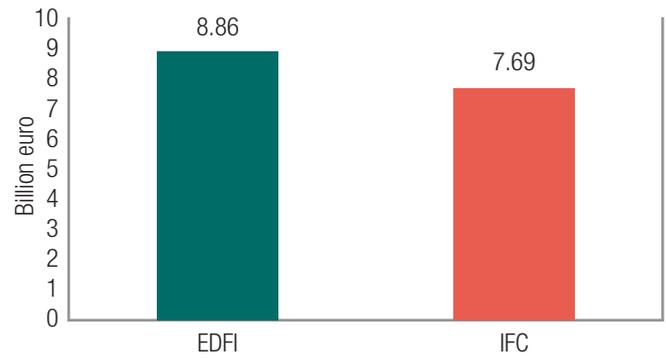


Note: Number of projects on right-hand axis. Note also that in 2014 EDFI's portfolio allocated to SSA countries was bigger than the IFC's committed portfolio directed to the same region.

Source: Authors' elaboration on data provided by EDFI.

Figure 9 shows that the total value of new investments in SSA has nearly tripled, from €0.9 billion in 2005 to €2.3 billion in 2014. Notably, the total value of new investments in SSA fell by 12% in 2010 and stagnated in 2011 and 2012, probably because of the effects of the global financial crisis and Eurozone crisis. However, investments increased significantly in 2013 and in 2014 they had more than doubled compared with in 2012.

Figure 8: EDFI portfolio vs. IFC portfolio in SSA, 2014



Note: EDFI portfolio refers to portfolio as at 31 December 2014, including undisbursed commitments; IFC's portfolio refers to committed portfolio as of 30 June 2014.

Source: Authors' elaboration on data provided by EDFI and IFC's annual report 2014.

Figure 9: EDFI new projects in SSA, 2005–2014



Source: Authors' elaboration on data provided by EDFI.

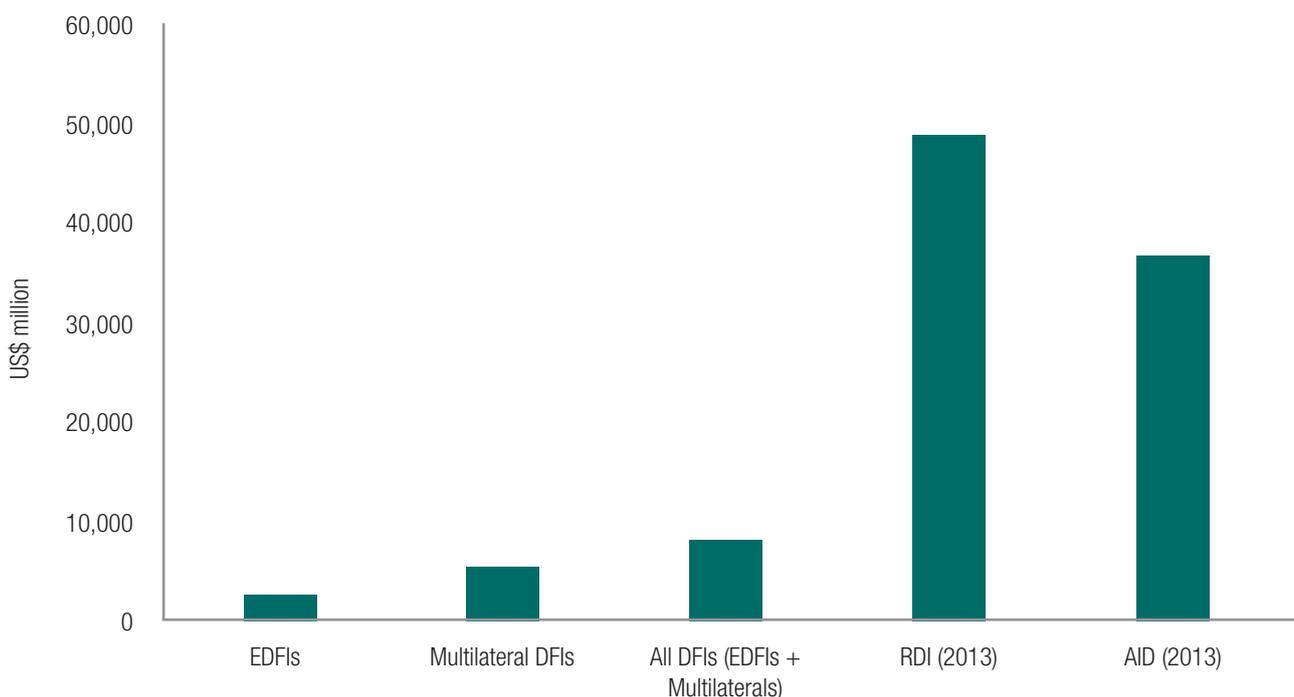
By comparing EDFI's investments in SSA with foreign direct investment (FDI) and aid directed to the same region, it emerges that in 2014 EDFI's investments represented 5% of FDI and 7% of aid (Figure 10). However, if we also take into account investments realised by multilateral DFIs (IFC, EIB and AfDB), then DFIs' investments represented 16% of FDI and 22% of aid (Figure 10) in SSA.

As Table 6 shows, among EDFI members there are some institutions that are more geared than others towards SSA countries. Indeed, in 2014, Swedfund and Sofid invested 64% and 58%, respectively, of their 2014 total portfolio in SSA followed by Norfund (47%) and

Finnfund (44%). It is worth noting that total exposure in SSA of 10 out of the 15 EDFI members is higher than that of the multilateral IFC, which in 2014 invested 17% of its committed portfolio in SSA economies. Other DFIs, such as Cofides, were more prone to invest in Central and South America (53%).

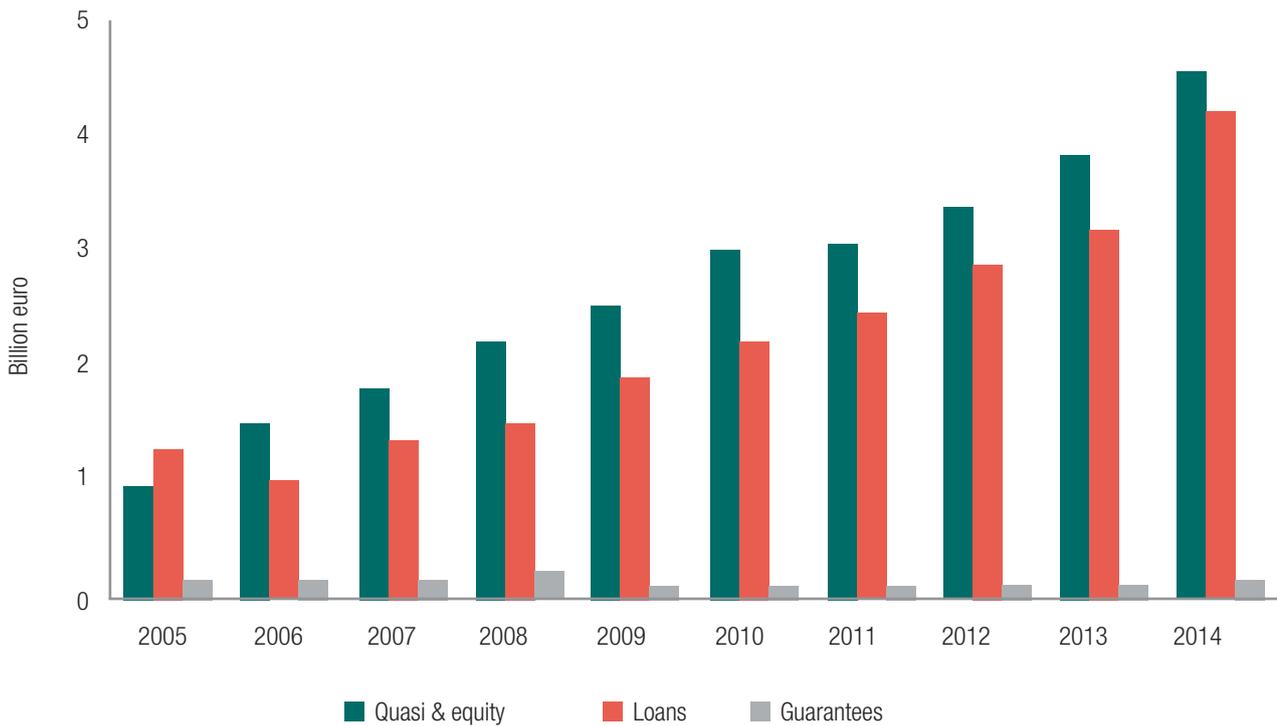
In terms of financial instruments, since 2006 EDFI's operations in SSA have been realised mainly through equity and quasi-equity, as shown in Figure 11. In 2014, 51% of EDFI's total portfolio in SSA came through equity and quasi-equity, compared with 47% realised through loans.

Figure 10: Development funding for SSA in 2014



Source: Authors' elaboration based on World Development Indicators (WDI) and reports by DFIs.

Figure 11: Distribution of EDFI portfolio by financial instrument in SSA, 2005–2014



Source: Authors' elaboration on data provided by EDFI.

Table 6: Distribution of DFIs' portfolios by geographical region, 2014

DFI	Geographical Region															
	SSA	Caribbean	Pacific	South Africa	North Africa	Mediterranean countries	Middle East	South America	Central America	South-East Asia	South Asia	China	Central and Eastern Europe	CIS	Russia	Other
BIO	29%	0%	0%	0%	1%	0%	0%	4%	7%	9%	15%	0%	0%	0%	0%	35%
CDC	34%	0%	0%	1%	1%	0%	0%	3%	1%	5%	23%	9%	0%	0%	0%	24%
Cofides	4%	1%	0%	0%	2%	0%	1%	32%	21%	1%	7%	15%	6%	0%	4%	4%
DEG	18%	0%	0%	3%	2%	5%	1%	14%	12%	11%	14%	6%	1%	5%	4%	3%
Finnfund	44%	0%	0%	1%	0%	3%	0%	3%	11%	11%	8%	3%	0%	1%	5%	10%
FMO	29%	1%	0%	3%	0%	4%	0%	11%	9%	11%	14%	2%	2%	7%	1%	7%
IFU	28%	0%	0%	2%	7%	1%	1%	6%	1%	8%	8%	19%	2%	8%	6%	3%
Norfund	47%	0%	0%	0%	0%	0%	0%	18%	9%	21%	5%	0%	0%	0%	0%	0%
OeEB	9%	0%	0%	0%	0%	7%	0%	2%	12%	3%	15%	0%	15%	13%	2%	21%
Proparco	36%	3%	0%	2%	6%	12%	1%	12%	7%	5%	8%	1%	0%	1%	0%	7%
SBI	3%	0%	0%	0%	0%	0%	0%	3%	11%	7%	2%	11%	2%	0%	7%	54%
Sifem	15%	0%	0%	6%	8%	0%	1%	7%	9%	15%	11%	9%	6%	5%	0%	8%
Simest	1%	0%	0%	1%	3%	2%	4%	14%	4%	2%	4%	18%	1%	2%	8%	35%
Sofid	58%	0%	0%	10%	3%	0%	0%	22%	6%	0%	0%	0%	0%	0%	0%	0%
Swedfund	64%	0%	0%	1%	0%	0%	2%	0%	0%	1%	14%	4%	0%	4%	2%	6%

4. The impact of DFIs in Africa: new evidence

This section provides new evidence of the effects of DFIs on different economic and social outcomes in SSA, including investment, economic growth, economic transformation and the use of renewable energy sources. It does this in two ways. We first use descriptive data analysis in specific countries and relate specific changes in outcome variables to changes in DFI investment (Section 4.1). We then test for the effects of DFIs on macroeconomic variables using econometric techniques (Section 4.2).

4.1 Descriptive analysis

We provide a number of graphical presentations that illustrate how investments of DFIs appear to be related to more investment in Ghana and Uganda, renewable investment in Kenya and labour productivity in Swaziland.

4.1.1 Gross fixed capital formation

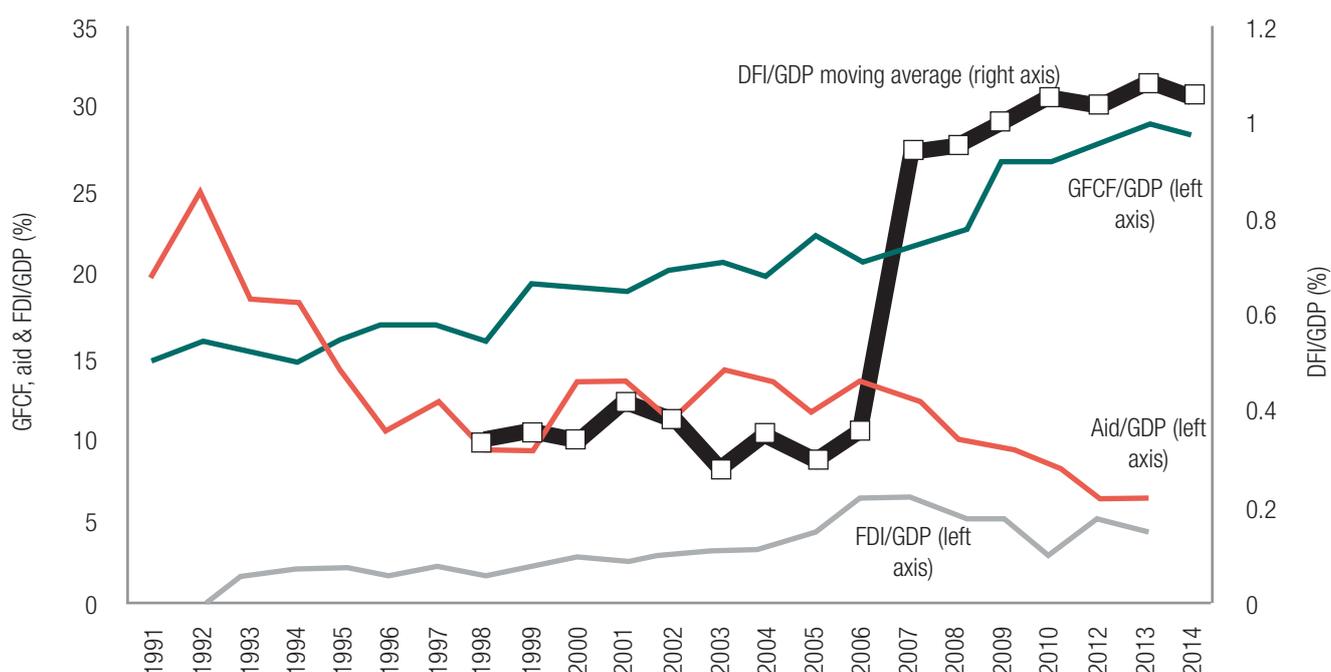
We first examine whether DFIs help increase total investment (GFCF), using Uganda as an example. Figure 12 shows how aid, GFCF, FDI and DFI investment

(seven-year moving average) have evolved over time in Uganda. GFCF (measured as a share of GDP) has increased steadily since 1991, with an acceleration after 2006. By 2014, GFCF represented 29% of GDP. Interestingly, it is possible to identify different sources of finance. Aid (measured as a share of GDP) has been falling and FDI has been increasing. Importantly, DFIs have also increased their support to GFCF and are equivalent to 1% of GDP. Increases in DFIs have been followed by increases in investment.

A few examples illustrate the issue. Several DFIs' activities in Uganda have focused on increasing electricity generation. For example, Norfund has invested in the Bugoye power plant, and CDC has been in partnership in the Uneme distribution network. Bujagali has also received significant DFI investment.

Investments in the power sector helped directly increase investment in Uganda. With DFI investments increasing, GFCF should increase when some of that DFI finance is used to build up fixed capital. However, DFIs have also crowded in more investments and had other indirect effects (Scott et al., 2013).

Figure 12: The increasing role of DFIs in supporting investment in Uganda



Source: Own calculations based on WDI, information provided from DFIs.

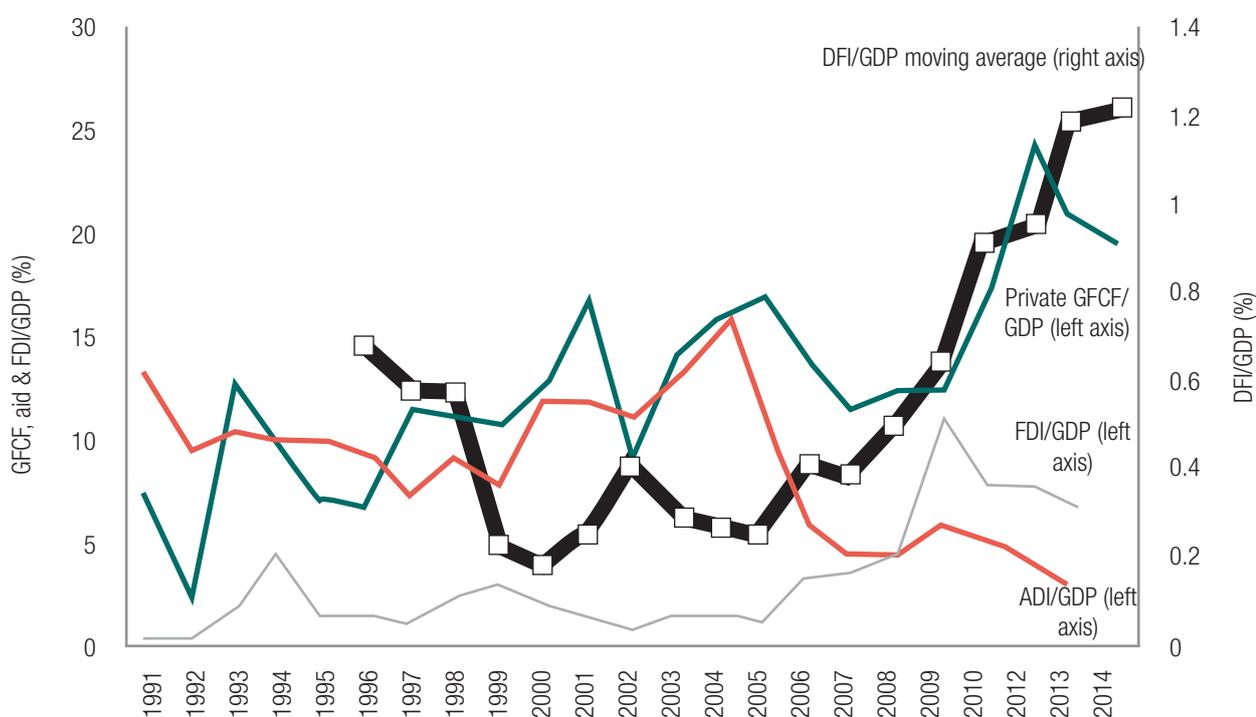
The relationship between DFIs' investment and GFCF is even more pronounced in the case of Ghana (see Figure 13). DFIs' investments and FDI, in general, have supported the important increase in GFCF since the mid-2000s. At the same time, aid has reduced its share as a source of finance in Ghana. In fact, since 2008, FDI has surpassed aid as a source of finance for development. In addition, DFI investments represented almost half the value of aid in 2013. If this trend continues, DFI investments will be as high as aid (excluding humanitarian aid).

This confirms the importance of FDI and DFIs in financing development as countries increase their level of development and income. Aid is critical to finance basic infrastructure in the early stages of development. However,

aid alone cannot provide the required finance as the country grows and its economy becomes more complex. In Uganda and Ghana, FDI (and in particular DFIs) have become greater sources of finance.

A final issue to highlight is the considerable investments in oil and gas extraction and electricity generation in Ghana (e.g. the IFC provided some \$315 million between 2009 and 2011). In addition, the Overseas Private Investment Corporation (OPIC) has agreed to provide \$250 million to the construction of the Aboadze combined-cycle power generation plant.⁹ The availability of gas as a result of the investments in extraction has led to investments in power generation.

Figure 13: DFIs and other financial flows in Ghana



Source: Own calculations based on WDI, information provided from DFIs.

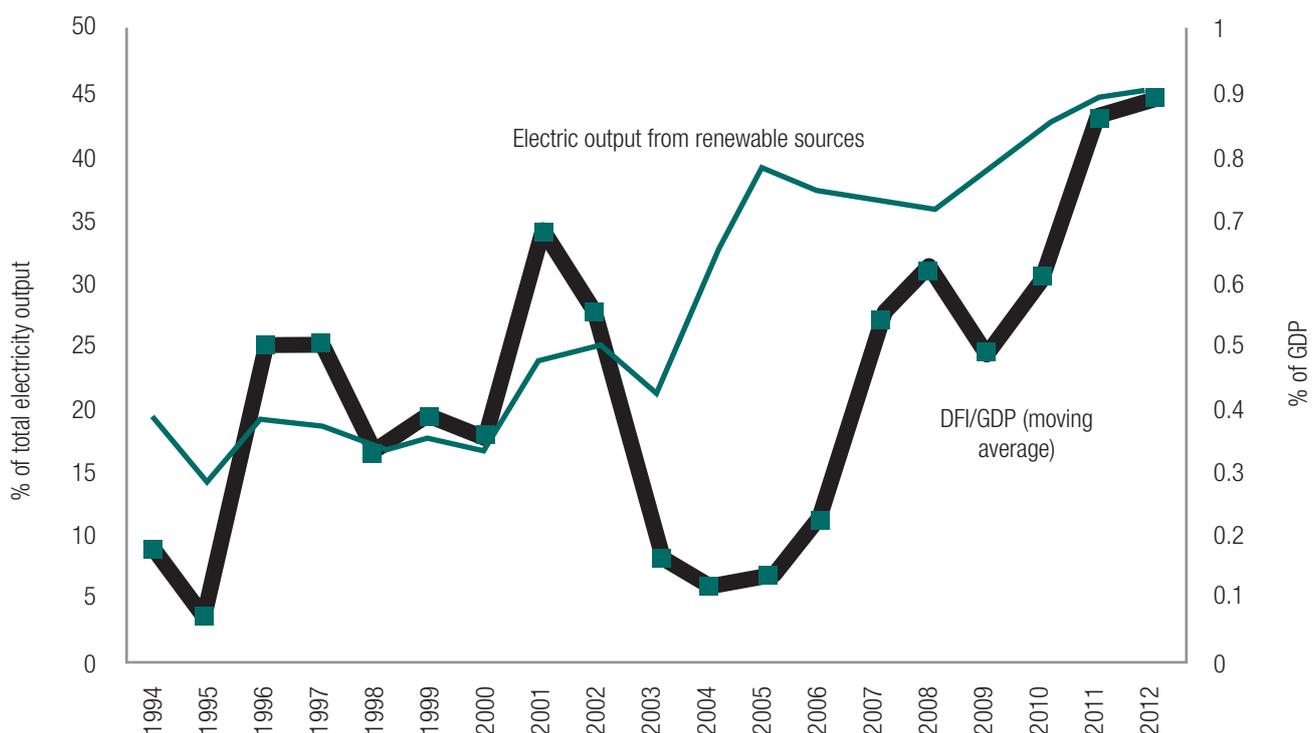
⁹ <https://www.opic.gov/opic-action/featured-projects/sub-saharan-africa/amandi-energy-building-200-megawatt-power-plant-ghana>

4.1.2 Renewable energy

DFIs have been particularly active in providing finance for renewable energy projects. They tripled their investment in renewable energy across the world between 2007 and 2011 (Griffith-Jones et al., 2012). Not only does the finance of DFIs use longer maturities, but also it is regarded as less risky by other financiers. In the renewable energy projects, where risks are high and the project maturity is very long, DFIs have proved key in securing funds for these investments.

Figure 14, for example, shows that, as DFI investments (as a percentage of GDP) are growing in Kenya, the output from renewable sources in Kenya has also increased during the period. There have been important investments in renewable energy sources. This includes geo-thermal, wind power and hydro generation. For example, there has been significant investment in the Olkaria geothermal projects, which supply a significant share of electricity in Kenya.

Figure 14: DFIs support the production of energy from renewable sources in Kenya



Source: Own calculations based on WDI, information provided from DFIs.

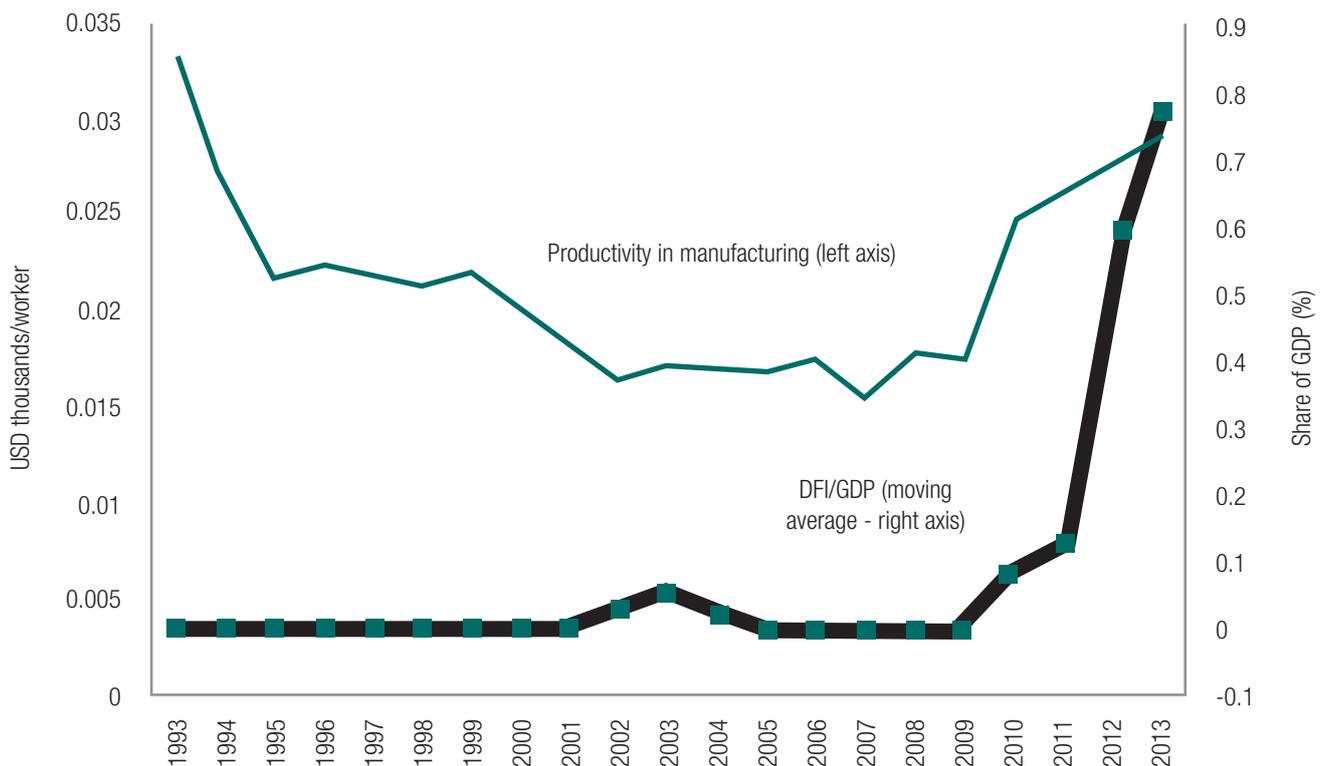
4.1.3 Labour productivity

Figure 15 shows the relationship between labour productivity in the manufacturing sector and DFI investment as a share of GDP in Burundi. Loans provided by the IFC, for example, may have contributed to the increase in labour productivity in the manufacturing sector.

4.1.4 Exports

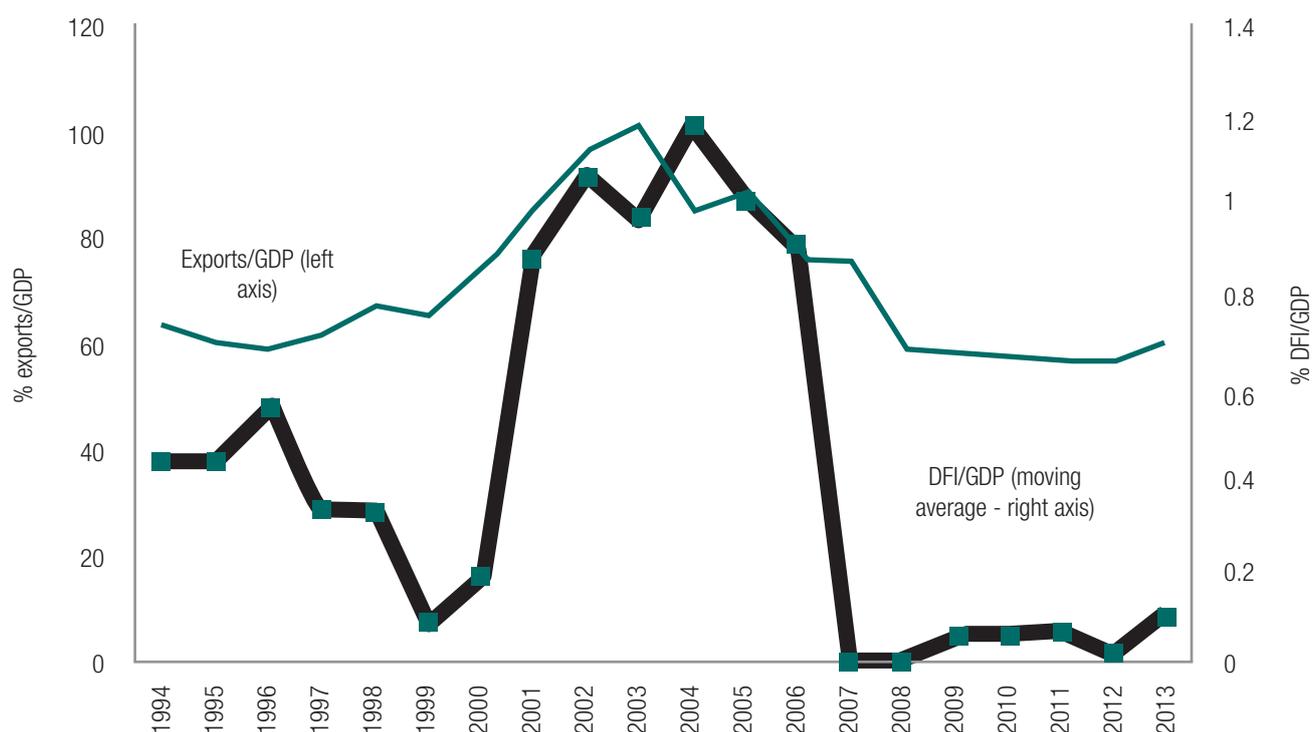
DFI investments can help increase trade and diversify the export structure. Lack of access to finance and its high cost are a major constraint for SSA firms. Figure 16 shows that exports (measured as a share of GDP) and DFI investments have followed a similar evolution in the example of Swaziland. Exports are higher in a period when DFI investments were particularly high and decrease as soon as DFI investments begin to lose momentum. DFIs support exports in Swaziland.

Figure 15: DFIs channel investments that support economic transformation in Burundi



Source: Own calculations based on WDI, information provided from DFIs.

Figure 16: Exports and DFIs in Swaziland



Source: Authors' calculations based on WDI, information provided from DFIs.

4.2 Econometric analysis

The analysis presented so far has focused on the relationship between DFI investments and different economic outcomes in particular countries. In each case, we identified the simple correlations between DFI investment with investment, production of renewable energy, economic transformation and trade. However, this analysis provides only a partial description of the effects of DFI investments in SSA. Moreover, these graphical relationships do not take into account other developments that may have affected these outcomes. This section presents an econometric analysis that addresses these points. In doing so, it updates similar previous econometric analysis (te Velde, 2011). It focuses specifically on SSA countries and using more detailed data on individual DFIs.

4.2.1 Data

We have undertaken a significant data collection effort on country-specific investments by DFIs in SSA. Harmonised data on DFIs do not exist. For example, the OECD¹⁰ has created a database that attempts to fill this gap, but this has limited time, country and DFI coverage. EDFI publications provide data on investment by region but not by country. We requested information from DFIs on their operations and we have searched annual reports and websites for additional data. In addition, we have used a database previously used in Jouanjean and te Velde (2013). For the purpose of harmonisation, we have used committed investments rather than effectively disbursed investments. This is because the former tend to be the most common way of presenting the data by DFI. Table 7 shows the sources of DFI data.

10 <http://www.oecd.org/dac/stats/development-finance-institutions-private-sector-development.htm>

Table 7: DFI investments data description

DFI	Time range	Source
AfDB	2005–14	Annual reports
CDC	2004–14	Provided by DFI
DEG	1990–14	Jouanjean, te Velde. (2013)/annual reports
EIB	1990–14	Jouanjean, te Velde. (2013)/annual reports
Finnfund	2004–14	Provided by DFI
IFC	1990–14	Jouanjean et al. (2013)/annual reports
IFU	2005–14	Provided by DFI
Norfund	2005–14	Provided by DFI
OeEB	2008–14	Provided by DFI (DFI started in 2008)
OPIC	2002–14	Annual report/website
Proparco	2005–14	Annual report/website
Sifem	2008–14	Provided by DFI (DFI started in 2008)
Sofid	2004–14	Provided by DFI
Swedfund	2004–14	Provided by DFI

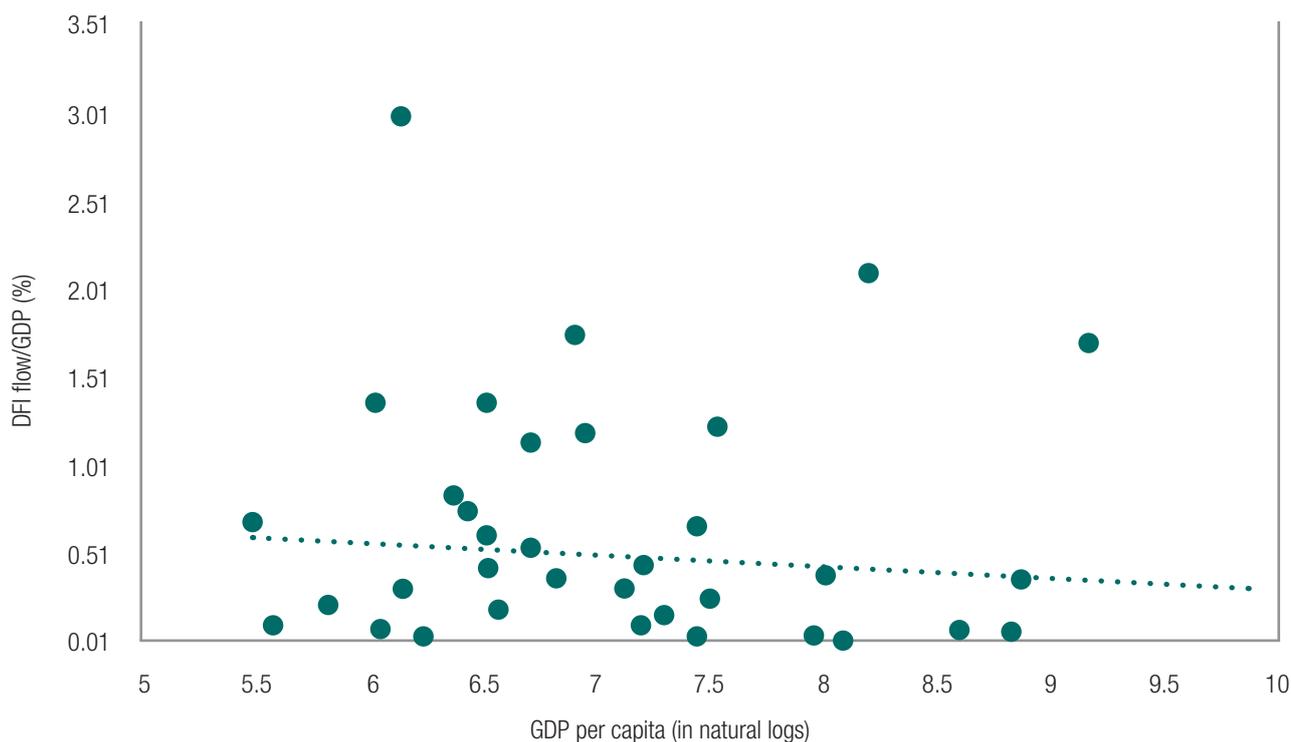
Note: Data were requested from all DFIs. BIO replied that they could not provide the data in the format required.

Data on economic variables have been taken from the World Bank’s World Development Indicators (WDI) and from the UN Conference on Trade and Development (UNCTAD) from the period 1990–2013. Bilateral aid data were obtained from the OECD. We have excluded humanitarian aid in the construction of the aid series.

Figure 17 presents country-specific data for DFI by level of income. DFI activities are significant in relative terms in certain countries. In the case of Cape Verde, Chad, Liberia and Mauritius, finance by DFIs is equivalent to more than 1.5% of total GDP. The relationship between DFIs and level of income in SSA is negative, suggesting that, for richer countries, the activities of DFIs become less important in relative terms.

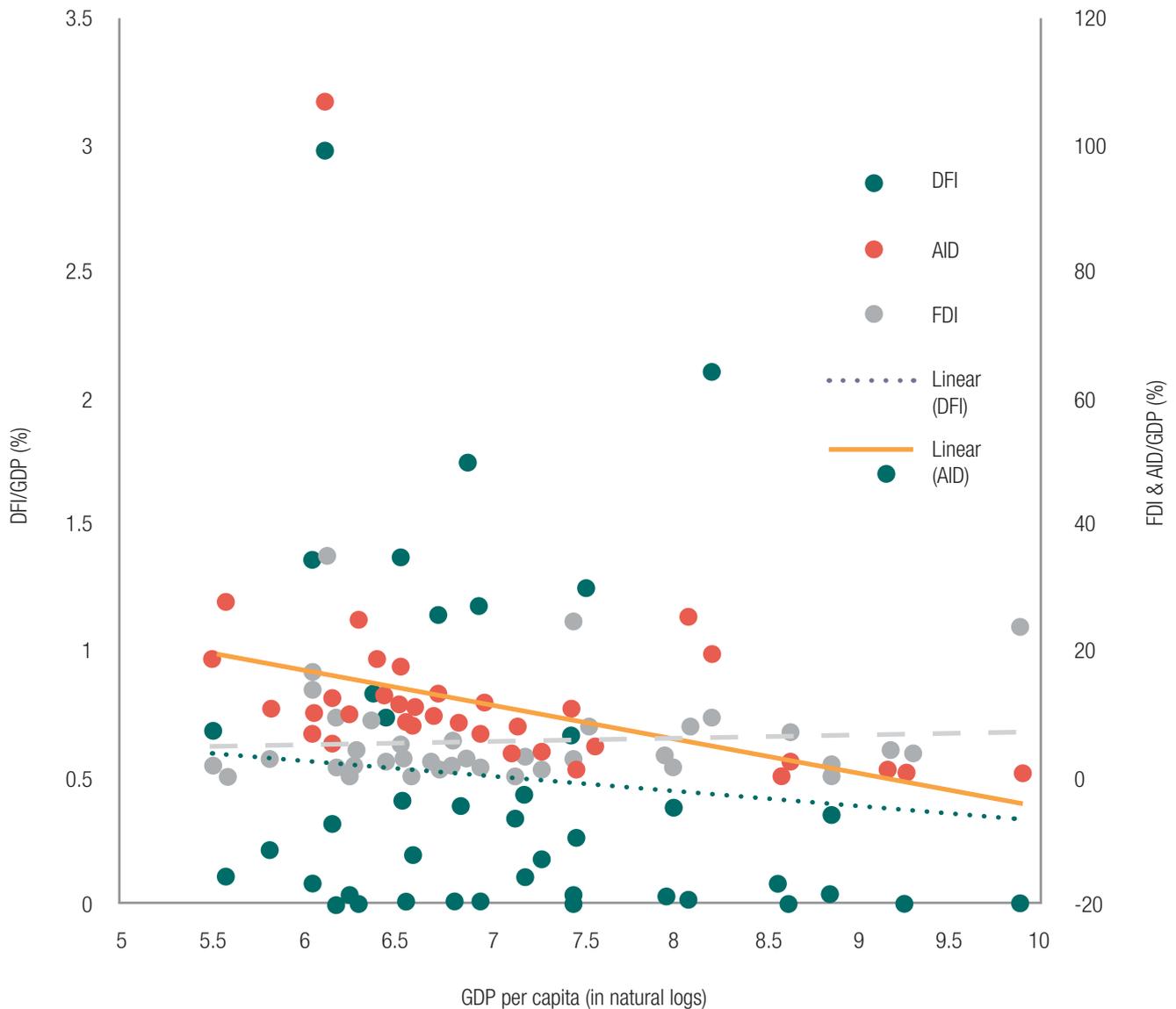
By contrast, Figure 18 shows how FDI gains share in GDP as countries develop. At the same time, there is a negative relationship between share of aid in GDP and level of development. Aid decreases its share in development finance faster than DFI. In some cases, as we have seen in Ghana in Figure 13, FDI has surpassed aid as a source of development finance. Overall, we find the aid share is much higher in poorer countries, followed by the share of DFIs, whereas the share of FDI is higher in richer countries.

Figure 17: DFI investments and level of development in SSA, 2010



Source: Own calculations based on WDI, information provided from DFIs.

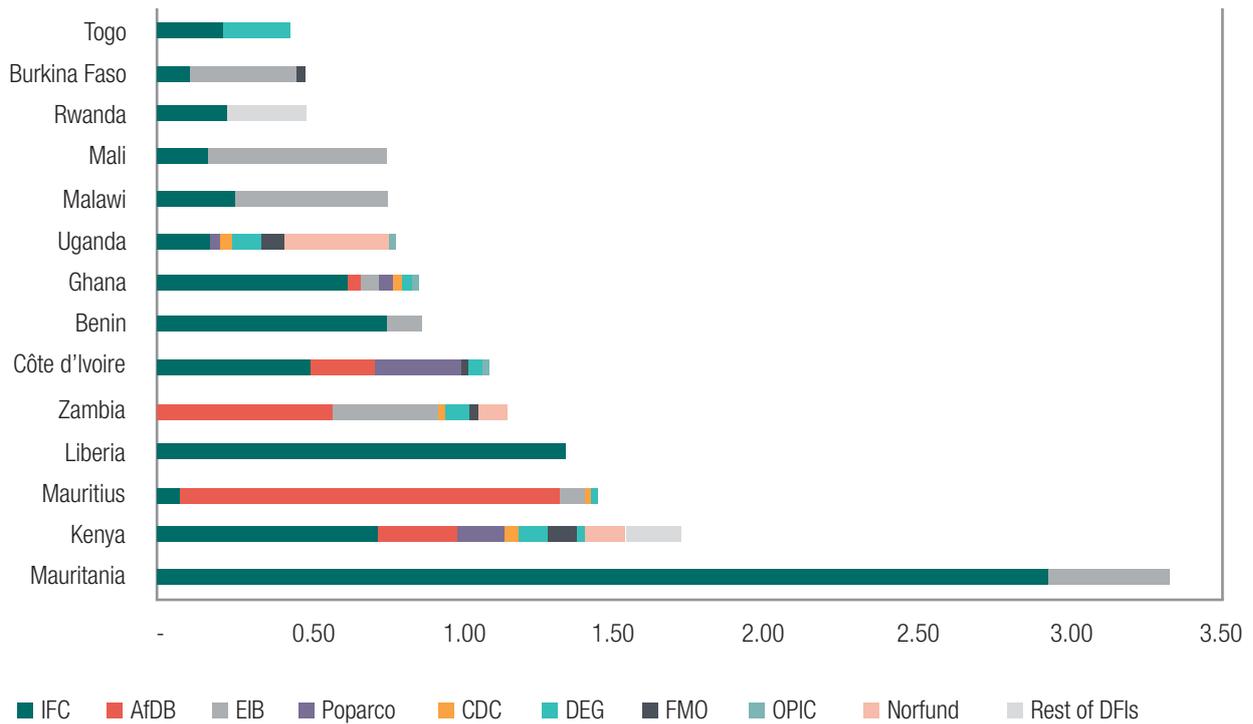
Figure 18: DFIs, aid and FDI in sub-Saharan Africa, 2010



Source: Own calculations based on WDI, information provided from DFIs.

There is no specific pattern of DFIs across individual SSA countries. Figure 19 presents the composition in terms of DFI investments for the largest recipients. The IFC is the largest DFI in most of the countries. However, in some countries, such as Mali, Malawi, Mauritius and notably Zambia, it is not the main investor. Norfund has allocated a significant amount of investments in Kenya and Uganda.

Figure 19: DFIs' investments as a share of GDP by country and DFI in selected SSA countries, 2013



Source: Own calculations based on WDI, information provided from DFIs.

4.2.2 Effects on economic growth

As discussed in Section 2.2.1, DFIs can have an important effect on economic growth. We use two approaches. The first approach estimates a simple equation:

$$\Delta y_{it} = \gamma \Delta y_{it-1} + \beta DFI_{jit} + \alpha X_{it} + u_{it} \quad (1)$$

Where y_{it} is the natural log of the constant GDP per capita of country i in time t .¹¹ The use of natural logs allows for computing the growth rate using the difference operator. DFI_{jit} is the j 's DFI investment in country i at time t , as a ratio of current GDP. This model allows for adjusting for some dynamic effects captured by the lag value of the GDP per capita growth rate. X_{it} is a vector that captures other sources of development finance. In particular,

- Aid: represented by aid (excluding humanitarian aid) as a ratio to current GDP
- FDI: represented by FDI as a ratio to current GDP.

We have fitted our model using four different specifications:

- FE: Fixed Effects
- RE: Random Effects
- FE-Time: Fixed Effects with time dummies
- FE-Time-Other: Fixed Effects with time dummies and other development finance variables.

We estimated the model separately for investments by IFC, EIB, AfDB, DEG, CDC, OPIC, Norfund, BDFI (rest of the bilateral DFIs) and all the DFIs. Sample sizes for each estimation differ based on the different availability of data for each DFI. Table 8 presents the results.

The effect of DFI activity on the rate of GDP per capita growth is positive in all cases. However, in only some of the DFIs the effect tends to be significant. This is the case for IFC, DEG, CDC and OPIC. In the rest of the cases, the effect is not significant.

In addition to this simple approach, we have followed a more complex method to estimate the effect of DFIs on the GDP per capita growth rate. Massa (2011) uses the GMM in panel data analyses originally presented by Arellano and Bond (1991) and subsequently developed by Arellano and Bover (1995) and Blundell and Bond (1998). Again, we use

$$y_{it} = \gamma y_{it-1} + \beta DFI_{it} + \alpha X_{it} + u_i + \varepsilon_{it} \quad (2)$$

where the variables have similar interpretation as in equation (1)

$$\Delta y_{it} = \gamma \Delta y_{it-1} + \beta DFI_{jit} + \alpha X_{it} + u_{it}$$

however, u_i are the unobservable country-specific characteristics and ε_{it} is an error term. Differencing equation (2), we obtain:

$$\Delta y_{it} = \gamma \Delta y_{it-1} + \beta \Delta DFI_{it} + \alpha \Delta X_{it} + \Delta \varepsilon_{it} \quad (3)$$

¹¹ The difference operator applied on natural log variables approximates the growth rate.

Country-specific characteristics given by u_i vanish. One of the advantages of this approach is that we can use observations of the endogenous variable as our instrument. This allows us to treat our model as weakly endogenous and avoid the definition of instrumental variables.

In addition to the data presented above, we have included additional macroeconomic variables as control variables:

- Inflation (pi_{it}): The annual inflation rate. In principle, low inflation levels should reflect macroeconomic stability. This suggests that the higher the inflation, the lower the economic growth. However, in the specific context of SSA in the past 10 years, there has been high inflation (associated with high commodity price inflation) and strong economic growth. This implies that, in this case, it is unclear what effect would dominate.
- FDI (fdi_{it}): There is a general agreement that FDI helps increase economic growth. However, it has been claimed that FDI is beneficial only when countries have developed sufficiently their financial markets (Alfaro et al., 2004). In the case of SSA, this link between FDI and economic growth may not be very strong, especially in those countries with the lowest income.
- Trade openness ($tradeop_{it}$): The evidence associated with the effect of trade on economic growth is mixed. Trade has been generally considered as a major force to help countries adjust and transform their economies; however, in terms of its effects on the macro economy this relationship is disputed. Frankel and Romer (1999) and many others point to a positive effect, whereas Rodriguez and Rodrik (2001) considered that trade openness had no link with growth. However, in a context of economic growth fuelled by international prices, it is expected that trade openness will help partially capture the effect associated with the growth in prices.
- Government Consumption (GOV_{it}): This captures the size of the government. There is a general tendency for government expenditure to be associated with lower economic growth. The evidence in its favour is strong in the case of developed countries, as Robert and Alexander (1990) and others point out. However, for developing countries, Devarajan et al. (1996) find government expenditure can actually boost economic growth.

Table 8: Effects of DFI investments on economic growth

	IFC			EIB			AfDB			DEG		
	FE	RE	FE-Time-Other									
Yt-1	0.162*** (0.000)	0.208*** (0.000)	0.153*** (0.001)	0.169*** (0.000)	0.221*** (0.000)	0.159*** (0.001)	0.100** (0.035)	0.205*** (0.002)	0.099** (0.034)	0.147*** (0.000)	0.179*** (0.000)	0.281*** (0.000)
DFI	2.578*** (0.002)	2.183*** (0.003)	2.583*** (0.004)	0.032 (0.921)	0.267 (0.376)	0.230 (0.457)	-0.201 (0.720)	-0.282 (0.466)	-0.070 (0.872)	3.895* (0.096)	4.197* (0.070)	-0.008 (0.977)
Fdi			0.038 (0.119)			0.041* (0.088)			0.026 (0.385)			0.026 (0.014)
aid			0.001 (0.957)			0.007 (0.568)			-0.004 (0.806)			0.009 (0.171)
Const	1.293*** (0.000)	1.261*** (0.000)	0.135 (0.845)	1.445*** (0.000)	1.338*** (0.000)	-0.481 (0.547)	1.971*** (0.000)	1.749*** (0.000)	2.100*** (0.000)	1.400*** (0.000)	1.362*** (0.000)	1.389*** (0.001)
Obs	916	916	869	958	958	958	444	444	444	859	859	397

	CDC			OPIC			Norfund			BDFI		
	FE	RE	FE-Time-Other									
Yt-1	0.104** (0.020)	0.166*** (0.002)	0.107** (0.018)	0.111** (0.036)	0.182*** (0.000)	0.117** (0.038)	0.101** (0.035)	0.205*** (0.002)	0.208*** (0.003)	0.102** (0.035)	0.207*** (0.002)	0.281*** (0.000)
DFI	0.213 (0.952)	6.982 (0.226)	2.862* (0.052)	2.965 (0.191)	4.631* (0.061)	0.416*** (0.006)	-2.143 (0.525)	2.772 (0.351)	3.134 (0.293)	0.657 (0.461)	0.754 (0.383)	0.675 (0.829)
fdi			0.045 (0.117)			0.061*** (0.006)			0.027 (0.359)			0.026 (0.367)
aid			-0.008 (0.566)			-0.017 (0.125)			-0.004 (0.795)			-0.006 (0.707)
Const	2.001*** (0.000)	1.831*** (0.000)	2.503*** (0.000)	1.822*** (0.000)	1.673*** (0.000)	0.423 (0.470)	1.982*** (0.000)	1.707*** (0.000)	2.462*** (0.000)	1.922*** (0.000)	1.688*** (0.000)	2.288*** (0.000)
Obs	477	477	488	572	572	576	446	446	446	445	445	399

Note: p-values in brackets
* p<0.10, ** p<0.05, *** p<0.01

Table 9 presents the descriptive statistics of the variables used in the estimation. These overall effects are similar to those presented by Massa (2011), particularly those associated with lower-income countries.

Table 10 presents the estimation results. In terms of the control variables, the coefficients are ambiguous. FDI is not significant in any of the cases but inflation is significant and with the expected sign, especially in the estimations that cover a long period. There is a positive and significant coefficient on the trade openness variable across all estimations. This suggests that, particularly in past years, trade has been a major factor associated with growth in SSA economies. On the other hand, DFIs seem to play a role in economic growth once the effects of trade and commodity prices are controlled for. However, the effects differ depending on the DFI. The IFC, DEG and OPIC have positive and significant effects on economic growth. For the other DFIs, the effect is not significant. This might be explained by a higher frequency of no activity for these DFIs in comparison with the others.

Table 9: Variables – descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Controls weighted by GDP (in natural logs)					
GDP growth rate	823	1.088	1.033	-4.773	4.960
FDI	994	1.203	0.933	-2.230	4.678
GOV	1,001	2.712	0.431	1.114	4.256
PI	924	4.737	0.358	4.504	10.081
Tradeop	1,047	4.199	0.502	2.375	6.276
DFIs weighted by GDP (in natural logs)					
IFC	1,072	0.078	0.167	0	1.482
EIB	1,073	0.107	0.250	0	2.165
AfDB	456	0.051	0.205	0	2.181
DEG	952	0.017	0.064	0	0.792
CDC	501	0.011	0.035	0	0.333
OPIC	591	0.015	0.114	0	1.973
Norfund	457	0.009	0.031	0	0.295
Rest of DFIs	456	0.042	0.124	0	1.149

Table 10: Effects of DFI investments on economic growth, adjusting for endogeneity

	IFC				EIB				AfDB				DEG			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
y1	-0.218** (0.042)	-0.221** (0.035)	-0.225** (0.034)	-0.230** (0.038)	-0.184* (0.079)	-0.188* (0.069)	-0.203** (0.044)	-0.207** (0.049)	-0.189 (0.193)	-0.187 (0.189)	-0.214 (0.117)	-0.216 (0.114)	-0.169 (0.114)	-0.168 (0.114)	-0.181* (0.086)	-0.182 (0.101)
y2	-0.144** (0.038)	-0.142** (0.039)	-0.138** (0.046)	-0.127* (0.067)	-0.119* (0.078)	-0.116* (0.083)	-0.117* (0.083)	-0.108 (0.114)	-0.158** (0.047)	-0.158** (0.048)	-0.164** (0.042)	-0.166** (0.039)	-0.123* (0.050)	-0.119* (0.057)	-0.119* (0.059)	-0.121* (0.053)
DFI	0.461** (0.005)	0.467** (0.004)	0.431** (0.002)	0.459** (0.002)	0.164 (0.116)	0.201 (0.110)	0.201 (0.152)	0.201 (0.128)	0.293 (0.196)	0.294 (0.228)	0.313 (0.182)	0.322 (0.174)	1.102*** (0.002)	1.181*** (0.001)	1.014*** (0.008)	1.000*** (0.002)
Tradeop	0.932*** (0.005)	0.911*** (0.004)	0.981*** (0.002)	1.050*** (0.002)	0.904*** (0.005)	0.869*** (0.004)	0.874*** (0.004)	0.963*** (0.002)	1.468*** (0.000)	1.438*** (0.000)	1.443*** (0.000)	1.414*** (0.001)	0.931*** (0.004)	0.925*** (0.002)	0.945*** (0.002)	0.990*** (0.003)
FDI	0.088 (0.137)	0.099 (0.114)	0.092 (0.140)	0.092 (0.140)	0.100 (0.124)	0.102 (0.139)	0.095 (0.167)	0.095 (0.126)	0.107 (0.089)	0.107 (0.273)	0.098 (0.356)	0.091 (0.394)	0.089 (0.156)	0.089 (0.156)	0.090 (0.180)	0.094 (0.161)
GOV	-0.209 (0.577)	-0.209 (0.577)	-0.169 (0.621)	-0.169 (0.621)	-0.158 (0.675)	-0.158 (0.675)	-0.126 (0.715)	-0.126 (0.715)	0.045 (0.897)	0.045 (0.897)	0.067 (0.845)	0.067 (0.845)	-0.127 (0.723)	-0.127 (0.723)	-0.080 (0.806)	-0.080 (0.806)
PI	-1.376* (0.090)	-1.376* (0.090)	-1.376* (0.090)	-1.376* (0.090)	-1.488* (0.058)	-1.488* (0.058)	-1.488* (0.058)	-1.488* (0.058)	0.151 (0.900)	0.151 (0.900)	0.151 (0.900)	0.151 (0.900)	-1.338 (0.113)	-1.338 (0.113)	-1.338 (0.113)	-1.338 (0.113)
Obs	371	362	358	354	379	370	366	362	219	213	209	209	362	353	349	346
	CDC				OPIC				Norfund				BDFI			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
y1	-0.223 (0.219)	-0.218 (0.217)	-0.253 (0.132)	-0.255 (0.128)	-0.238* (0.072)	-0.238* (0.065)	-0.263** (0.033)	-0.271** (0.029)	-0.047 (0.644)	-0.218** (0.046)	-0.268*** (0.005)	-0.270*** (0.004)	-0.272 (0.145)	-0.271 (0.135)	-0.307* (0.069)	-0.310* (0.066)
y2	-0.154 (0.113)	-0.147 (0.126)	-0.161 (0.104)	-0.164* (0.095)	-0.185** (0.012)	-0.185** (0.013)	-0.193** (0.012)	-0.211*** (0.007)	-0.027 (0.627)	-0.064 (0.341)	-0.067 (0.314)	-0.067 (0.311)	-0.160 (0.175)	-0.153 (0.197)	-0.162 (0.182)	-0.163 (0.182)
DFI	1.231 (0.163)	1.255 (0.179)	0.769 (0.376)	0.706 (0.406)	0.363*** (0.001)	0.324*** (0.004)	0.228** (0.021)	0.245** (0.017)	-0.613 (0.681)	-0.736 (0.634)	-1.187 (0.434)	-1.039 (0.494)	0.284 (0.352)	0.290 (0.356)	0.196 (0.449)	0.183 (0.476)
Tradeop	1.572*** (0.000)	1.502*** (0.000)	1.522*** (0.000)	1.498*** (0.001)	1.520*** (0.000)	1.400*** (0.000)	1.378*** (0.000)	1.354*** (0.002)	1.652*** (0.003)	1.640*** (0.002)	1.891*** (0.001)	1.900*** (0.002)	2.159*** (0.000)	2.108*** (0.000)	2.089*** (0.001)	2.010*** (0.001)
FDI	0.109 (0.314)	0.109 (0.314)	0.092 (0.412)	0.087 (0.440)	0.116 (0.233)	0.104 (0.319)	0.095 (0.370)	0.095 (0.370)	0.119 (0.197)	0.119 (0.197)	0.166 (0.118)	0.173 (0.106)	0.098 (0.288)	0.098 (0.288)	0.092 (0.339)	0.092 (0.383)
GOV	0.259 (0.532)	0.259 (0.532)	0.283 (0.488)	0.283 (0.488)	0.215 (0.562)	0.215 (0.562)	0.227 (0.539)	0.227 (0.539)	-0.140 (0.791)	-0.140 (0.791)	-0.139 (0.789)	-0.139 (0.789)	0.056 (0.902)	0.056 (0.902)	0.080 (0.859)	0.080 (0.859)
PI	-0.026 (0.982)	-0.026 (0.982)	-0.026 (0.982)	-0.026 (0.982)	0.949 (0.487)	0.949 (0.487)	0.949 (0.487)	0.949 (0.487)	0.242 (0.833)	0.242 (0.833)	0.242 (0.833)	0.242 (0.833)	0.649 (0.542)	0.649 (0.542)	0.649 (0.542)	0.649 (0.542)
Obs	192	188	184	184	242	236	232	231	197	190	182	181	160	158	155	155

Note: p-values in brackets
 * p<0.10, **p<0.05, ***p<0.01

4.2.3 Effects on investment

Section 2.2.1 discussed the effects of DFIs on investment. In addition, Section 4.1 showed how DFIs in certain contexts have been associated with other investments. In this section, we present general evidence on the link between DFIs and investment in SSA countries. We used a simple model based on equation (1) above.

We use the same explanatory variables (Aid and FDI) to control for the effects of DFI investments on GFCF (as a ratio of GDP). Table 11 presents the estimation results. These models are similar to those presented above.

There is a general positive effect of DFIs on GFCE. This effect is positive and significant in the cases of the investments of IFC, EIB, OPIC, Norfund and the Rest of the DFIs. This means a generalisation of the result found previously. These results and those previously found

suggest the sector of investment may play an important role in boosting investment. Investments made in sectors with strong forward linkages such as electricity generation or the financial sector could improve the prospects of other financial projects that are affected by the relaxation of these constraints.

4.2.4 Effects on productivity

Table 12 presents the results of the estimations of the effects of each DFI on the change in labour productivity. In general, the effects tend to be small or non-significant. Only the investments made by the IFC, OPIC and Norfund have had a positive and significant effect on labour productivity. This might be explained by the sectors where these investments have been made.

Table 12: Effects on labour productivity

	IFC			EIB			AfDB			DEG		
	FE	RE	FE-Time-Other									
Y1	0.168*** (0.000)	0.207*** (0.000)	0.170*** (0.001)	0.176*** (0.000)	0.219*** (0.000)	0.175*** (0.001)	0.095 (0.211)	0.189** (0.010)	0.111 (0.115)	0.209*** (0.003)	0.208*** (0.001)	0.254*** (0.000)
DFI	3.891*** (0.000)	3.367*** (0.001)	4.075*** (0.000)	-0.331 (0.606)	-0.174 (0.773)	-0.074 (0.892)	0.159 (0.837)	-0.005 (0.993)	0.255 (0.686)	0.088 (0.839)	0.604 (0.881)	1.511 (0.728)
fdi			-0.006 (0.879)			0.001 (0.976)				0.014 (0.649)		0.032 (0.217)
aid			-0.009 (0.530)			-0.003 (0.831)				0.051*** (0.008)		0.008 (0.438)
Const	0.882*** (0.000)	0.861*** (0.002)	1.301 (0.190)	1.241*** (0.000)	1.153*** (0.000)	0.602 (0.494)	1.682*** (0.000)	1.478*** (0.000)	1.715*** (0.000)	0.927* (0.092)	1.111*** (0.000)	0.576 (0.575)
Obs	843	843	842	884	884	883	381	381	381	380	798	797
	CDC			OPIC			Norfund			BDFI		
	FE	RE	FE-Time-Other									
Y1	0.137* (0.055)	0.225*** (0.001)	0.236*** (0.000)	0.164** (0.013)	0.240*** (0.000)	0.175*** (0.004)	0.095 (0.212)	0.188** (0.011)	0.213*** (0.003)	0.208*** (0.004)	0.096 (0.214)	0.209*** (0.003)
DFI	-5.012 (0.571)	13.879 (0.202)	6.109* (0.074)	1.224 (0.612)	4.286* (0.088)	0.466** (0.047)	-0.972 (0.837)	5.453 (0.259)	5.609 (0.220)	5.873 (0.149)	1.573 (0.273)	0.195 (0.890)
Fdi			0.033 (0.197)			0.068** (0.011)				0.014 (0.653)		0.014 (0.643)
aid			0.035* (0.064)			-0.003 (0.896)				0.051*** (0.007)		0.050*** (0.013)
Const	1.621*** (0.000)	1.297*** (0.000)	1.453* (0.077)	1.435*** (0.000)	1.254*** (0.000)	0.509 (0.529)	1.703*** (0.000)	1.433*** (0.000)	1.250*** (0.000)	0.508** (0.035)	1.607*** (0.000)	0.930* (0.090)
Obs	414	414	422	504	504	507	382	382	382	381	381	380

Table 13: Effects of aggregated DFI investments on growth, GFCF and labour productivity

	Growth rate				GFCF				Productivity			
	FE	RE	FE-Time	FE-Time-Other	FE	RE	FE-Time	FE-Time-Other	FE	RE	FE-Time	FE-Time-Other
Yt-1	0.101** (0.035)	0.205*** (0.002)	0.207*** (0.003)	0.280*** (0.000)	0.388*** (0.002)	0.818*** (0.000)	0.826*** (0.000)	0.796*** (0.000)	0.094 (0.223)	0.192** (0.010)	0.214*** (0.003)	0.209*** (0.004)
DFI	0.129 (0.368)	0.141 (0.249)	0.208** (0.033)	0.239** (0.027)	0.016 (0.951)	0.056 (0.779)	0.016 (0.934)	-0.097 (0.700)	0.266 (0.248)	0.278 (0.152)	0.363** (0.033)	0.267* (0.090)
FDI				0.021 (0.493)				0.066 (0.425)				0.007 (0.806)
Aid				-0.005 (0.734)				0.023 (0.401)				0.049*** (0.010)
Const	1.898*** (0.000)	1.665*** (0.000)	1.673*** (0.000)	1.370*** (0.001)	13.926*** (0.000)	4.251*** (0.000)	3.250*** (0.002)	3.413*** (0.002)	1.573*** (0.000)	1.340*** (0.000)	1.352*** (0.006)	0.905* (0.098)
Obs	445	445	445	398	416	416	416	379	381	381	381	380

Note: *p*-values in brackets

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2.5 Aggregated effects

Table 13 presents the aggregated results for all DFIs together. In these regressions, we have aggregated the investments of all DFIs into a single variable. This has limited the number of observations to the period 2005–2013.

The combined effect of all DFIs on the GDP per capita growth rate and on labour productivity is positive and significant. However, the average impact of DFI investments on GFCF is not significant. Nevertheless, as we have seen, in some cases DFIs have been associated with an increase in FDI and domestic investments.

4.2.6 Conclusions

This section has provided new empirical evidence on the effects of DFIs on the macro-economy of SSA countries. We first provided a number of graphs that illustrate how investments of DFIs appear to be related to increased (private sector) investment in Ghana and Uganda, renewable energy use in Kenya and labour productivity in Swaziland.

We then collected data on DFI committed investments at country level for SSA. We used these data to understand the effects on macroeconomic variables and find the following:

- *Economic growth.* The effect of DFI investments on the rate of GDP per capita growth is positive for all DFIs and significant for IFC, DEG, CDC and OPIC. Pooling DFIs, we find a significant and positive effect on the GDP per capita growth rate. If the DFI/GDP ratio increases by 1% (which is approximately \$15 billion for the whole of SSA), per capita growth increases by 0.24% on average. This would, however, require a tripling of current levels of DFI investment.
- *Investment.* There is a positive effect of DFIs on GFCF. This effect is significant for IFC, EIB, OPIC, Norfund and the Rest of the DFIs. Pooling DFIs, we find no significant effect on investment. However, the experience in cases such as Ghana and Uganda suggests DFI investments have pulled new FDI and domestic investment into their economies.
- *Labour productivity.* In general, the effects tend to be small. Only the investments made by the IFC, OPIC and Norfund have had a positive and significant effect on labour productivity. Pooling DFIs, we find a positive and significant effect on labour productivity. If DFI/GDP increases by 1%, labour productivity increases by 0.27% on average.
- *Renewable energy use.* DFI investments have been associated with increases in the use of renewable energy in Kenya, with investments in alternative generation technologies beyond hydro-electrical power.

5. Conclusions

DFI investments are becoming increasingly important in providing development finance in SSA. Together with FDI (and domestic investment), loans and equity from DFIs can help transform economies and increase incomes. As SSA countries grow, they are meeting new challenges and constraints that aid grants alone will not be able to address. While aid is falling as a source of funding, DFIs and FDI are increasingly taking the lead in the development finance options.

DFI investments tend to be concentrated in loans and equity in the financial sector and in the provision of infrastructure, where investments in energy generation have been very important. Investments in these two sectors are important as they tackle some of the most important development constraints SSA countries face. DFIs have also been active in providing finance for investments in renewable energy production. DFIs are better prepared

to cope with the requirements of renewable energy investments projects with long maturity.

We have found a general positive and significant effect of DFI investment on economic growth and labour productivity, which confirms the transformational potential of these interventions. The effect is also present when the actions of certain individual DFIs are considered. This shows that some DFIs are effective in bringing growth and economic transformation. For example, investments made by the IFC, DEG, CDC, Norfund and OPIC have been effective.

The findings in this paper have wider implications. Shareholders expect DFIs to play a key role in global development. This paper shows that DFIs already have important effects on macroeconomic variables such as economic growth and labour productivity.

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World Bank: Rossing Uranium Mine lies about 70km inland from Swakopmund close to the small town of Arandis. It was founded by amateur geologist Capt. Peter Louw in 1928 largely owned by the Rio Tinto Group (69% shares). In 2006 the mine produced about 7% of the world production of primary produced uranium. The mine is a long term supplier of uranium to the world nuclear power industry. Haul trucks being repaired and serviced at the workshop on the mine.

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