A brief review of the role of development finance institutions in promoting jobs and productivity change

Isabella Massa, ODI

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Overseas Development Institute
203 Blackfriars Road,
London SE1 8NJ, UK

Tel: +44 (0)20 7922 0300
Fax: +44 (0)20 7922 0399
www.odi.org.uk

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Abbreviations

AfDB	African Development Bank
BIO	Belgian Investment Company for Developing Countries
CDC	Commonwealth Development Corporation
DEG	German Investment Corporation
DFI	Development Finance Institution
DIAF	Development Impact Assessment Framework
DOTS	Development Outcome Tracking System
EBRD	European Bank for Reconstruction and Development
EDFI	European Development Finance Institution
EIB	European Investment Bank
FAO	Food and Agriculture Organization of the United Nations
FMO	Netherlands Development Finance Company
GPR	Corporate-Policy Project Rating
ICT	Information and Communications Technology
IDC SA	Industrial Development Corporation South Africa
IFC	International Finance Corporation
IFU	Investment Fund for Developing Countries
ILO	International Labour Organization
ODI	Overseas Development Institute
Proparco	French Investment and Promotions Company for Economic Cooperation
Swedfund	Swedfund International

Abstract

This study examines the linkages between development finance institutions (DFIs), employment, and productivity change. In particular, it shows that DFIs may enhance job opportunities and productivity change through a number of channels, which are: (i) additionality; (ii) demonstration effects; (iii) technical change; and (iv) forward and backward linkages. The evidence emerging from the existing literature shows that DFIs have generated a significant amount of direct, indirect and induced jobs, as well as promoted innovation (and therefore productivity) in several different sectors ranging from health to education, environment, ICT, insurance, and infrastructure. Although there is no consensus in the academic literature, recent DFI studies find that productivity increases may lead to additional employment creation, thus highlighting DFIs' potential to promote high-productivity jobs. Moreover, it appears that DFIs are most likely to generate jobs and benefit the poor through interventions directed at improving access to finance, infrastructure, investment climate and training. However, notwithstanding recent improvements, there are still gaps in the existing methodologies used to assess the economy-wide employment effects and the impact of DFIs' investments on productivity change, which need to be addressed in the future.

1 Introduction

Employment creation and productivity change may play a key role in fostering development in poor economies. Indeed, the World Bank (2013) highlights that jobs may contribute to development by boosting living standards, raising productivity, and by fostering social cohesion. Moreover, jobs are recognized by the impoverished as the most important pathway out of poverty.[1] Note, however, that not only the quantity but also the quality of jobs is important to promote development. On the other hand, productivity growth is the engine of economic growth, and is key in raising living standards and reducing poverty. Technological change is the prime source of productivity: technology directly increases the productivity of innovating firms, and indirectly raises economy-wide productivity through its diffusion and adoption.

Notwithstanding this, in developing countries many hundreds of millions of people are unemployed. ILO (2012) reports that employment growth in developing economies declined from 3.8% over the period 2007-10 to 2.2% in 2011. More recent estimates also show that, of the 4 million new cases of unemployment in 2012, about 3 million occurred in developing regions such as Sub-Saharan Africa and South Asia (ILO 2013). Unemployment has been particularly widespread among vulnerable groups. In particular, youth unemployment rates have increased in two-thirds of all developing countries (ILO 2012). Unemployment represents just one aspect of the employment problem in developing economies, as they are also affected by informality, working poverty, and underemployment. In addition to this, the technology gap between rich and poor economies remains wide, and the capacity of developing economies to adopt new technology remains weak, with important consequences in terms of productivity change. According to the World Bank (2008), the level of technology that developing countries use is only one quarter of that employed in high-income countries.

In this context, there is increased interest in assessing the role that development finance institutions (DFIs) may play in fostering job creation and productivity change. DFIs are multilateral, regional or bilateral institutions that are set up to service the investment shortcomings of developing countries. They provide financing (e.g. loans, guarantees and equity positions) to the public or private sector, with the purpose of fostering shared economic growth and sustainable development while remaining financially viable in the long term. Although the core business of DFIs is to invest financial resources, they also provide support in enhancing knowledge through capacity building and technical assistance, and work to strengthening environmental, social and corporate governance standards in business practices. DFIs operate according to three principles: (i) additionality; (ii) catalytic role; and (iii) sustainability. Additionality refers to the fact that DFIs aim to be additional support to other financial flows and domestic investment. Through their interventions, DFIs seek also to catalyse investment from other investors both directly and indirectly by bringing comfort and demonstration effects. Likewise, DFIs promote sustainable growth by reducing dependence on aid and improving governance and environmental standards as well as good business practices (Dalberg 2010).

This study, which is part of a larger ODI research project (see Jouanjean and te Velde 2013), aims to briefly examine the linkages between DFIs, employment and productivity. This is relevant to better understand the development impact of DFIs, and to inform DFIs' impact assessments.

The structure of the paper is as follows. Section 2 analyses the theoretical linkages between DFIs and employment creation, and reviews the empirical evidence on the impacts of DFIs on job creation, distinguishing between direct jobs, indirect jobs, and induced jobs. It also examines the issues associated to assessing DFIs' impact on jobs, and describes how DFIs measure how their own operations affect employment creation. To accomplish this, the section will focus on the most recent methodologies developed, and highlight their pros and cons. Section 3 discusses the linkages between DFIs and productivity change, and reports on empirical findings. It also illustrates the tension between employment creation and productivity change, emphasising DFIs' role in promoting high-productivity jobs. Section 4 concludes.

[1] The Commission on Growth and Development (2008) reports that an increase of 2% per year of average household incomes leads to a reduction between 1.2% and 7% of poverty rates.

2 DFIs' impact on job creation

2.1 DFIs' impact channels on employment

DFIs put considerable emphasis on employment creation when explaining and assessing their role in promoting economic development. Indeed, several development finance institutions recognize job creation as one of their top priority objectives (see Box 1).

Box 1: Priority objectives of selected DFIs - Employment

- **IFC:** "Our purpose is to create opportunity for people to escape poverty and improve their lives by: […] helping generate productive jobs […]."
- **AfDB:** "Creation of employment opportunities […] will be an important objective in all Bank Group's projects and programmes in the public or private sectors."
- **EIB:** "We support projects that make a significant contribution to […], employment, […] in Europe and beyond. Specifically, our six priorities, as defined in our Operational Plan, are: Supporting the creators of 80% of new jobs (small and medium sized enterprises SMEs); […]"
- **CDC:** "CDC's mission is to support the building of businesses throughout Africa and South Asia, to create jobs and make a lasting difference to people's lives in some of the world's poorest places."

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

Sources: http://www1.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/about+ifc/vision; AfDB. 2012. *Private sector development policy of the African Development Bank Group*; http://www.eib.org/about/index.htm; http://www.cdcgroup.com/who-we-are.aspx

Moreover, employment creation is one of the key indicators used by several DFIs to measure the development impact – in particular the economic performance – of their investments. For example, the IFC, EIB, FMO and CDC use job creation as a quantitative indicator to assess the economic performance of their investment operations (Massa 2011). On the other hand, contribution to employment is one of the indicators used by DEG to measure the development effect/sustainability dimension of the Corporate-Policy Project Rating (GPR) composite index (*ibid.*).

But how do DFIs promote employment? Through a number of channels, including:

- *Additionality* – DFIs operate according to the principle of additionality, which states that development finance institutions should aim to focus on investments in countries, sectors and business segments that most investors consider too risky. By doing this, DFIs may increase the overall activities of an economy, and hence employment.

- *Demonstration effects* – DFIs' projects can demonstrate the potential of new types of investment, thus leading to further investments by other private sector players. As a result, new activities, and hence new jobs may be created.

- *Technical change* – In addition to investing financial resources, DFIs provide support in enhancing knowledge through capacity building and technical assistance, and contribute to strengthening environmental, social and corporate governance standards in business practices. By fostering greater managerial and innovation capabilities, DFIs raise firms' potential for growth and investment in technology, and skills with possible consequent employment gains.

- *Forward and backward linkages* – DFIs can support activities (e.g. manufacturing firms) that have indirect effects through backward linkages, such as need for inputs. This can generate new employment in the supplier. DFIs can also help other firms and households upstream. For example, infrastructure investments (ports, roads, energy) can increase productivity, which can support new activities and jobs. Spill-over effects depend on a number of factors including policies, institutions and local supplier capacities.

Through the channels mentioned above, three categories of job may be created:

1. *Direct jobs* – these are jobs directly employed by firms supported by DFIs;
2. *Indirect jobs* – these are jobs created by the suppliers and distributors of DFI-supported firms;
3. *Induced jobs* – these are jobs resulting from increased consumption by direct and indirect employees of DFI-supported firms.

Several DFIs capture information on direct jobs created in client companies through their development impact assessment frameworks (e.g. DEG's GPR, IFC's DOTS or FMO's scoring system). Table 1 illustrates some of the latest figures available on direct employment creation as reported by a selected sample of DFIs.

Table 1: Direct jobs created by a selected sample of DFIs in 2011

DFIs	Portfolio end 2011 (€ million)	Direct jobs created
IFC	32,803	2,500,000
CDC	3,825.7	976,000
DEG	5,646.9	110,000
Proparco	3,612.7	89,000
IFU	504.7	4,500

Source: Author's elaborations on different sources.

A few DFIs also measure the generated indirect jobs (Box 2). Note, however, that indirect jobs are very difficult to measure and the reported figures are often underestimated. The DEG's figure (130,000 indirect jobs) mentioned in Box 2, for example, considers only indirect jobs generated at the supply end, while jobs created at the purchaser end are neglected (Dangelmaier 2012). Induced jobs are also very difficult to assess, and very little is known on them. Because of this, it is still very difficult to know the precise impact of DFIs on total employment creation.

Box 2: Indirect jobs created by a selected sample of DFIs

- DEG reports that 130,000 indirect jobs will be created in 2011 through its new financing (Dangelmaier 2012).
- Proparco is expected to create 273,000 jobs indirectly in 2011 (Proparco 2011).
- BIO is estimated to have contributed indirectly to the creation or maintenance of nearly 39,000 jobs in 2010 (BIO 2011).
- The average 5 billion euro per year committed during 2006-08 by the European DFIs (EDFIs) are expected to generate, for each investment year, 1.3 million indirect jobs, in addition to the 422,000 direct jobs created in their client companies (Dalberg 2010).

2.2 Issues in assessing DFIs' impacts on job creation

Direct job measures alone may be misleading in assessing DFIs' impacts on employment creation. The IFC (2013) argues that to estimate DFIs' economy-wide job creation effects, besides to direct jobs, other factors should be considered:

- Indirect jobs;
- Induced jobs;
- Second-order growth effects;
- Net job creation.

There is evidence, indeed, that indirect and induced jobs created by DFI-supported firms are significant. For example, a recent analysis conducted by the IFC on one of its client gold mining companies in Ghana reveals that, for every direct job in the mine, 28 jobs were supported in the economy (IFC 2012a). In a similar way, a study conducted in Tanzania suggests that for every job created in the petroleum sector, an additional 3 jobs were generated in the economy (*ibid.*). Moreover, five micro-case studies conducted in Bangladesh, India, Ukraine, Africa and Indonesia reveal that IFC-supported firms operating in the manufacturing, agribusiness and service sectors generated a significant number of indirect jobs in the supply and distribution chains (24,000 indirect jobs versus 5,700 direct jobs). The majority of these jobs were created for unskilled or semi-skilled workers, thus likely contributing to poverty reduction (Kumar and Abdo 2013). Note also that DFIs' investments in certain sectors of the economy may generate indirect and induced jobs, which are more relevant than direct jobs (IFC 2013; Jouanjean and te Velde 2013). Indeed, while in the manufacturing sector most of the jobs created by DFIs' investments are direct jobs, in the tourism sector indirect jobs represent the largest share of job creation associated with DFIs' investments in hotels. In the infrastructure sector, induced job effects appear to be the most relevant. On the other hand, DFIs' investments in agriculture lead to the creation of a high number of direct jobs but a small number of indirect jobs (Table 2). Therefore, accounting only for the direct job effects of DFIs' projects in these sectors overlooks their potentially high impact on job creation.

Table 2: Relevance of DFIs impacts on employment creation by sector

Sector of DFIs' 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: Author's elaboration on Jouanjean and te Velde (2013) and Oikawa and Casadevall (2013).

Second-order growth effects refer to the impacts of DFI-supported investments on employment. These investments can lead, for example, to more reliable power, which allows firms to produce more and more efficiently, and increase employment. A study by Datta et al. (2013) shows that 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. In particular, 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 additional 1,600 jobs in West Bengal over the same time horizon. On the other hand, net job creation refers to jobs created (expected to be created) minus jobs destroyed (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 FAO/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 United States, for every hundred jobs added by introducing modern retail stores, fifty were lost in competing enterprises over

the next five years. The IFC (2013) highlights that measuring net job creation effects is very difficult since it requires knowing the relative elasticity of the job supply.

Another issue when assessing DFIs' impacts on employment creation is evaluating whether jobs created by DFIs' investments benefit the poor. Indeed, as highlighted in detail by Bortes et al. (2011), it is not always the case that employment creation contributes to growth and poverty reduction. For example, the creation of highly skilled jobs in poor countries with a low-skilled labour force, may produce minimal development effects. Moreover, the jobs created by DFIs' investments may not benefit poor people because of significant rigidities in labour markets in developing economies. Therefore, DFIs cannot assume that all jobs created through their investments benefit low-income demographics.

Additionally, it is worth highlighting that in their assessments, DFIs do not distinguish between short-term and long-term employment, where short-term jobs are for temporary periods, while long-term jobs include permanent, part-time and seasonal jobs. Moreover, they do not look at incomes resulting from employment. There are, however, DFIs that look at employment creation by gender (e.g. IFC), or at empowerment of marginalised groups such as women or the disabled (e.g. IDC SA).

2.3 DFIs' methodologies for assessing employment impacts

In light of the above, innovative estimation procedures are needed to better assess the economy-wide employment impacts of DFIs. Next to the methods used to measure direct job effects (see section 2.1), so far DFIs have also developed diverse methodologies for assessing indirect/induced jobs created by their investments. These methodologies range from multiplier analysis, to input-output models and micro-econometric analysis. The multiplier analysis aims at assessing DFIs' job creation results by making use of various multipliers including: total number of jobs in the economy per number of dollars of project cost, per number of dollars of investment or per number of direct jobs created (IFC 2013). Input-output models, instead, allow quantifying direct, indirect and to some extent induced job creation, by taking into account linkages between different sectors of the economy. On the other hand, micro-econometric analysis makes use of econometric techniques to assess employment effects at the firm or household level.

Nevertheless, these methodologies have several limitations. For example, IFC (2013) highlights that multipliers tend to overstate the employment creation effects of DFIs' projects (e.g. because they do not take into account job losses in competitors), and do not capture properly indirect employment effects. Shortcomings of the input-output models include the built-in assumption of constant productivity ("Leontief" or fixed-proportion production functions – without regard to structural changes over time), the equal treatment of different types and terms of financing, and the fact that there is no distinction of different sizes and productivity levels of beneficiary firms (Oikawa and Casadevall 2013). Other limitations of the described methodologies are reported by Jouanjean and te Velde (2013) – see Table 3 (below).

DEG has also developed a new methodology to measure indirect jobs created by DFIs' investments at the national level. This method is derived from neoclassical growth theory, and uses a Cobb-Douglas production function as the key estimation method. A limitation of this method is that it is subject to a number of assumptions on a country's factor market conditions and aggregate production function, and the fact that it does not take into account sector-specific effects.

Table 3: Pros and Cons of DFIs' assessment methods for job creation effects

Approach	Positive aspects	Negative aspects	Possible data sources
Direct employment in DFI supported projects	Directly measurable	Does not measure displacement effects, or indirect and induced effects	Company reports
Macro production function approaches multiplier analysis	Can be used at macro level to see how (DFI) investment leads to output changes (could use ICOR, C-D / CES / Leontief / TFP approaches) which could then lead to employment effects (using employment intensities and I/O models). Useful for quick assessments at aggregated level, for manufacturing, but less useful when the quantity of "output" is not main or only factor of interest.	Involves use of assumptions, estimations of production functions, and employment intensities Less useful for induced effects	Requires (sectoral-level) national accounts
Input-output models	Useful to examine backward linkages across industries in traditional industries and hence indirect employment , could be linked to different types of skills, tax etc. to get a SAM	Not useful in case of transformative changes in production structures (e.g. large scale infrastructure investments) or when inputs are price dependent and substitutable, or when behavioural links change (in which case input-output coefficients would change) Cannot be used to examine the relationship between the level of services and employment creation	Labour force surveys National accounts
Firm level / national level econometrics	Useful to examine the effects of the level and quality of services supply on firm performance amongst a range of factors (and hence the induced effects, including on employment)	Data intensive (needs panel data)	Existing firm level surveys (e.g. WB enterprise survey)
Household level econometrics	Useful to examine the importance of DFI supported services in the household budget	Data intensive (panel data)	Household level surveys

Source: Jouanjean and te Velde (2013).

On the other hand, the IFC (2012a) has recently developed a new methodology based on micro-case studies across industries and countries, to measure both direct and indirect jobs created by its investments. In a nutshell, this methodology uses the client company's financial and industrial data, plus a variety of information gathered through interviews with the client company and its largest suppliers and distributors, in order to estimate the expected direct employment and first-order indirect employment creation.[2] Notwithstanding the improvements achieved, the IFC's methodology overall tends to underestimate job creation (Table 4). For example, the obtained estimates take into account changes in job creation only for some key suppliers and distributors, and do not consider the induced effects of the assessed projects, among others.

[2] The financial and industry data include: sales volume, assets, direct employment, female employment, cost of goods sold, purchases of goods and services from domestic suppliers, number of domestic suppliers. Information gathered through interviews refers to: employment including youth and female employment, wages at lowest category and number of people employed at this level, purchase volume from domestic suppliers, sales obtained. For more technical information on the methodology we refer the interested reader to IFC (2012a).

Table 4: Limitation of the IFC's methodology to measure indirect job creation

Category	Over/under estimate	Details from the model
Assumption that purchases to worker ratio remains constant	Overestimate	Overestimates job creation because it assumes a constant production function or that the productivity will stay the same, whereas it may increase
Assumption that purchases to cost of goods sold remains constant	Underestimate	Underestimates job creation because in reality the domestic purchases can be expected to increase because companies will often try to increase domestic purchases to save costs and reduce supply times.
Assessing employment at primary suppliers (and distributors)	Underestimate	Underestimate job creation as the analysis as the estimate only captures changes in job creation only for some key suppliers (and distributors)
Lack of assessment of induced effects	Underestimate	The model does not cover the induced effects of the project and thus underestimates the job creation attained
Lack of assessment of job destruction	Overestimate	Additional investment and increased employment at client company does not account for the job destroyed at competitor company and therefore the estimates do not include net job creation
Impact on government	Underestimate	In some cases, when there is a large tax payment by the client company to the government, this increase the resource base of the government and provides the fiscal space to undertake greater spending that can lead to further job creation

Source: IFC (2012a).

The IFC has also conducted a meta-evaluation (a review of 33 evaluations over the period 2000-11) in order to identify which DFIs' interventions are most likely to generate jobs and benefit the impoverished. The main findings of the study show that DFIs' activities aimed at improving access to finance, infrastructure, investment climate and in-class/on-the-job training have positive effects on employment creation (Michelitsch et al. 2013). DFIs' interventions in promoting training appear to be particularly beneficial for women and disadvantaged youth (ibid.).

3 DFIs' impact on productivity change

3.1 DFIs' impact channels on productivity change

DFIs may promote productivity change through a number of channels that are very similar to those through which they affect employment. These channels are:

- *Additionality* – By investing in technology intensive sectors (e.g. promising ICT sectors) where otherwise no investment would have taken place, DFIs support productivity increases and structural transformation.
- *Demonstration effects* – DFIs' projects can demonstrate the potential of investment in activities that are more innovative and productive than the average, thus attracting further investments by other private actors to those activities. This leads to productivity increases.
- *Technical change* – By introducing new technologies and supporting innovation through the firm management level (e.g. DFIs managers often sit on boards of client companies to which they bring know-how and innovative ideas), DFIs raise firms' productivity.
- *Forward and backward linkages* – DFIs can support activities (e.g. manufacturing firms) that have indirect effects through backward linkages, such as need for inputs. This can generate productivity increases to the supplier. DFIs can also help other firms and households upstream. For example, infrastructure investments can increase productivity.

3.2 Productivity change versus employment creation

Innovation and technological development, which are key in increasing productivity, are at the core of the mission of several DFIs as shown by Box 3.

Box 3: Priority objectives of selected DFIs – Innovation

- **AfDB:** "The Bank Group will promote technological upgrading and business organizational improvements of local enterprises in all economic sectors. It will support public or private sector initiatives on research and development (R&D) aimed at generating technological innovations as well as North-South, and South-South transfer of appropriate technologies and business models, their adaptation to local circumstances, and their dissemination among local enterprises."
- **EIB:** "Specifically, our six priorities, as defined in our Operational Plan, are: […] promoting innovation through investment in ICT and human and social capital; […]"
- **EBRD:** "We aim to promote market economies that function well – where businesses are competitive, innovation is encouraged, household incomes reflect rising employment and productivity, and where environmental and social conditions reflect peoples' needs."
- **Swedfund:** "New investment priorities for Swedfund include: environmental technology and energy, immigrant entrepreneurs, and post-conflict investment environments."

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

Sources: AfDB. 2012. *Private sector development policy of the African Development Bank Group*; http://www.eib.org/about/index.htm; http://www.ebrd.com/pages/about/what/mission.shtml; Dalberg (2010)

However, it is worth noting that DFIs' objective to promote innovation may seem at odds with their priority of creating employment opportunities. Indeed, increased productivity obtained through innovative technologies is often believed to imply that fewer workers are needed to produce the same amount of goods and services.

In the academia there is no consensus on the relationship between innovation and employment which appears to depend on several factors including, for example, the type of introduced innovation, the level of analysis (firm, industry, or country), the sector, etc. However, IFC (2013) indicates that innovation and higher productivity may lead to more jobs, especially in the case of product innovation. Indeed, technological advances and increases in productivity lead to lower costs of production, and consequently, to lower prices for goods. So, the product demand increases and firms become more competitive, thus generating additional activities and employment. The decrease in the cost of production may also provide incentives to firms to produce more, and as a consequence hire more workers. These effects are found to more than offset the employment-lowering effect of increased productivity.[3] Notably, the employment growth generated through innovation and productivity increases is found to be inclusive, meaning an increase in the number of low-skilled workers hired (*ibid.*). Moreover, there is evidence that technology advances and increased productivity, especially in the agricultural sector in agricultural and transforming economies, are essential for employment growth and poverty reduction (*ibid.*). A recent empirical study by Michelitsch and Shi (2013) shows that adoption of technology and innovation leads to gains in employment growth ranging from approximately 2 to 3 percentage points, and enhances labour productivity. Therefore, DFIs emphasise the promotion of high-productivity jobs.

3.3 DFIs' methodologies for assessing impacts on productivity change

A few DFIs have introduced indicators of technology transfer or other productivity gains in their development impact assessment frameworks. For example, both the DEG's GPR tool and the EIB's Development Impact Assessment Framework (DIAF) include indicators for technology and know-how transfer (Massa 2011; Bortes et al. 2011).

Nevertheless, as opposed to what has been described in Section 2 with respect to DFIs' impacts on job creation, there is no systematic evidence on the impact of development finance institutions on productivity change. Rather, there is a scattered number of case studies focusing on the technology or know-how transfer at the project level, its additionality, and its likely demonstration and replication effects. Case studies reveal that DFIs, through financing and technical assistance, have promoted innovation in several different sectors ranging from health (e.g. by investing in private hospitals and clinic or health funds) to education (e.g. through investments in private education), environment (e.g. by investing in energy efficiency or clean production projects), ICT, insurance (e.g. through investments in the development of weather insurance), and infrastructure (e.g. by investing in toll roads or water public-private partnerships) (IFC 2011).

[3] IFC (2013) reports that for each 1% gain in productivity, a 1.8% growth in number of jobs occurs.

4 Conclusions and policy implications

Currently, employment creation and productivity change are amongst the major challenges facing developing countries. This paper highlighted that development finance institutions (DFIs) may play a key role in enhancing job opportunities, technological development and innovation, which are priority in DFIs' agendas. In particular, it showed that DFIs can promote both employment creation and productivity change through a number of channels, which are: (i) additionality; (ii) demonstration effects; (iii) technical change; and (iv) forward and backward linkages.

The empirical evidence reveals that through these channels, DFIs have generated a significant amount of direct jobs, but also indirect and induced jobs. However, while DFIs can measure their own impact on direct job creation through their development impact assessments (e.g. DEG's GPR, IFC's DOTS, or FMO's scoring system), indirect and induced jobs are still difficult to assess. Different methodologies have been developed to measure the economy-wide employment impacts of DFIs' investments including multiplier analysis, input-output models, and micro-econometric analysis. To measure indirect job creation, DEG has also developed a methodology derived from neoclassical growth theory, while the IFC has launched a method based on micro-case studies across industries and countries. Nevertheless, all of these approaches are characterized by a number of limitations that constrain their ability to measure DFIs' economy-wide job creation effects.

The evidence reported in a number of case studies also shows that DFIs, through financing and technical assistance, have promoted innovation (and therefore productivity) in several different sectors, ranging from health to education, environment, ICT, insurance, and infrastructure. The analysis conducted in this paper suggests that, although there is still no consensus in the academic literature, productivity increases may lead to additional employment opportunities. Therefore, DFIs may play a key role in promoting high-productivity jobs.

The realisation of this virtuous circle by DFIs depends on their ability to directly encourage employment creation and technology development, or to remove obstacles to such activities. With respect to the latter and in order to promote job creation, a recent IFC's meta-evaluation indicates that it is important that DFIs' financing and technical assistance are directed to improve the business environment, develop infrastructure, reduce financial exclusion especially of micro, small and medium enterprises, and to enhance workers' skills. To promote technology development, DFIs should aim to foster greater managerial and innovation capabilities, remove regulatory, information and financing obstacles, and promote technological entrepreneurship.

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