Socio-Economic Impact of IFC Financing in Ghana
– An Assessment of Employment and Value-added –

Final Report
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steward redqueen
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Executive summary

Pursuing its goal of social and economic development by investing in the private sector, the International Finance Corporation (IFC) wants to understand the most effective way it can contribute to job creation and poverty reduction.

This socio-economic impact study of IFC’s investments in Ghana looks at the economy-wide impact on value-added and job creation of IFC’s financing of Ghana-based banks and private sector companies. It is part of a pilot project involving a similar assessment conducted in Jordan and two pro-forma analyses conducted for IFC in Sri Lanka and Tunisia.

The objective is to quantify IFC’s socio-economic impact in Ghana. As an investor in the country’s financial and non-financial sectors, IFC clearly contributes something to the country’s social and economical development. But the extent of that contribution—and the scale of its “multiplier effects” on areas such as job creation, GDP and tax revenue—cannot be estimated without formal modeling.

On the basis of the modeling approach adopted here, we find that as of 30 June 2011:

1. IFC had $317 million outstanding capital with Ghanaian financial institutions (FI) and private sector companies (non-FI).

2. As a result of these lending activities, IFC directly and indirectly supports at least 36,700 jobs (0.4% of the labor force) and at least $235 million of value-added in the Ghanaian economy (equivalent to 0.7% of Ghana’s GDP in 2011).
   - More than 60% of this $235 million ($151 million) of value-added is income to Ghanaian households in the form of salaries.
   - Companies benefit from at least $60 million in profits from IFC financing in Ghana;
   - The government receives $24 million in the form of tax revenues generated through IFC financing.

3. Besides these quantifiable impacts, IFC plays a further role in the Ghanaian economy by mobilizing international capital, and providing advisory services and technical assistance.

4. Based on the methodology applied, we find that certain tensions may arise between supporting absolute amounts of employment and the GDP contribution of each of those jobs. In particular, there are trade-offs between lending to firms and sectors which generate more employment with lower value-added per job (e.g. agriculture) and lending to enterprises that generate fewer employment but greater value-added per job (e.g. large-scale manufacturing).

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1 The data generated in this report are “best estimates” based on the available macroeconomic and firm-level information.
2 The term “supports” means that not all the jobs or value-added would necessarily vanish if IFC had not invested in its clients, since other lenders may have provided the same level of financing. Please also note the distinction between “creation” and “support”: “creation” indicates a net or incremental change while ‘support’ refers to an associated economic impact at a given point in time.
5. Investing in capital abundant companies is likely to lead to relatively few additional jobs in the short-term, but those investments may have the greatest potential to bring about long-term “transformational” effects.

6. Whereas the same trade-offs as described above also apply to financing provided to FIs, when comparing investments into non-FIs and FIs we generally find larger multipliers for FI investments. This is because FIs having a wider spread of companies in their portfolios while IFC supported non-FI companies tend to be larger, more productive firms.

7. We recommend to IFC’s management that it is crucial to recognize the various trade-offs that may exist when it comes to making investment decisions (e.g. between short-run and long-run impacts, or between employment generation and value-added creation). The IFC should therefore consider shaping a portfolio of investments that helps advance its overall objectives in Ghana.

We stress that, while the underlying methodology used for this study, input-output modeling, lets us quantify the wider socio-economic impact of IFC investments on various sectors, it also has its limitations. Financing provided to individual sectors has been translated into output, using a Leontief or fixed production function assuming constant returns to input. But this might not always be the case. In particular any “transformational” effects of IFC financing cannot be quantified this way. Moreover, the study works with sectors’ average productivity and spending patterns. It does not take into account differences between company sizes or the formal/informal sectors. Table 1 summarizes the main findings, where “participants” refers to third party mobilized capital.

*Table 1: Outstanding Finance (30 June 2011) and associated impact findings*

<table>
<thead>
<tr>
<th>Client Segment</th>
<th>IFC</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outstanding Finance in $ mln</td>
<td>Associated Value Added in $ mln</td>
<td>Associated Employment in ’000 jobs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Direct/Indirect</td>
<td>Induced Effect</td>
<td>Direct/Indirect</td>
<td>Induced Effect</td>
</tr>
<tr>
<td>NON-FIs</td>
<td>189.6</td>
<td>63.5</td>
<td>26%</td>
<td>7.7</td>
</tr>
<tr>
<td>FIs</td>
<td>127.3</td>
<td>171.1</td>
<td>26%</td>
<td>29.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>316.9</td>
<td>234.7</td>
<td>26%</td>
<td>36.7</td>
</tr>
</tbody>
</table>

| Participants |  |  |  |  |
|--------------|----------------|-----------------|----------------|
| TOTAL        | 39.8 | 12.5 | 25% | 1.0 | 65% |
1 Introduction, Objectives and Scope

Employment creation is a key area where the private sector can contribute to poverty reduction. The specific policy interventions most likely to induce the private sector to make investments in job creation, however, remain elusive.

In the industrialized world these interventions are an ongoing topic of debate, especially in the wake of the 2008-2009 financial crisis. In the developing world, where economic growth has been stronger in recent years, job creation has nonetheless lagged in many economies. Demographic developments related to young and growing populations in emerging countries, and female empowerment, mean more people are expected to enter the labor market in the near future. This will make employment creation a critical issue in the emerging world, and Ghana and Sub-Saharan Africa in particular, in the coming years.

In the light of these developments and challenges, IFC wants to sharpen its understanding of the effects of its investment and advisory services on job creation and value-added (defined as corporate profits, household incomes, and tax revenues).

The objectives of this study are to gain some general insights into the channels where the private sector contributes to job creation, value-added, and poverty reduction, and more specifically to quantify the impacts that can be attributed to IFC’s activities in Ghana.

Quantifying economic impacts can contribute to IFC decision-making by:

1. Anticipating the ex-ante estimate of potential effects by providing insights into the scale of effects of various investments on the local economy designed to have bolstering (positive) impacts;
2. Engaging IFC’s various stakeholders (including government agencies, non-government organizations, and private sector managers and employees), in discussions about how to improve IFC’s economic impacts, based on a realistic interpretation of facts.

The economic impacts discussed in this report arise from IFC’s investments into non-FI (private sector companies) and FI (financial institutions) clients. The economic impacts of IFC’s advisory services and non-quantitative impacts of IFC’s investments are shown qualitatively in side boxes. The report also has some suggestions for IFC’s management.
2 Ghana’s economy
Unlike many African economies that depend heavily upon a single commodity, Ghana remains relatively well diversified between agriculture, industry, commodities, and services. Oil production from the Jubilee field could tilt the economic balance towards commodities, and this could be a source of concern as dependence on minerals is often associated with the so-called “natural resources curse.”

From a trade balance perspective, however, Ghana’s current exports of such items as gold, timber, and cocoa are far outstripped by imports of capital equipment, petroleum, and food products. Leading to a trade deficit of some $5 billion. As oil exports generate more revenue the trade balance that could however become more balanced over the next years.

Ghana’s economy continues to revolve around agriculture, which employs 85% of the workforce but only contributes about 30% of GDP. The government and other stakeholders must continue to develop policies and programs that ensure productivity gains in the agricultural sector, but from a development point of view it is also crucial to create jobs in other sectors to enable a transition to higher value-added jobs.

In recent years Ghana has taken important strides to improve its business climate, encouraging greater foreign direct investment and private sector participation in the economy. In the World Bank’s “Doing Business 2013” Ghana ranked 64th, down one from last year. While this suggests more needs to be done to make the country an attractive place to do business on a global scale, recent business climate improvements make the country one of Africa’s leading reformers.

Table 2: Key indicators of the Ghanaian economy 2010

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>24.4 million</td>
</tr>
<tr>
<td>Size of workforce</td>
<td>10.4 million</td>
</tr>
<tr>
<td>Gross Domestic Product (GDP)</td>
<td>$32.3 billion</td>
</tr>
<tr>
<td>GDP per capita (current $)</td>
<td>$1,325</td>
</tr>
<tr>
<td>Tax and other revenues as % of GDP (2009 est.)</td>
<td>12.6%</td>
</tr>
</tbody>
</table>

Sector breakdown of GDP
- Agriculture: 29.9%
- Industry: 18.7%
- Services: 51.4%

GDP by expenditures as % of GDP
- Domestic demand: 75.6%
  - Private consumption: 9.5%
  - Government expenditure: 26.7%
- Investment: 29.3%
- Export of goods and services: 41.1%
- Import of goods and services: 41.1%

Source: World Bank (2010 est.)

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Fig. 1: Gross Capital Formation (GCF; right axis) and Foreign Direct Investment (FDI; left axis) as percentage of GDP. Source: World Bank Database

Fig. 2: Growth of real Gross National Income (GNI) per capita in current $. Source: World Bank Database 2010

2.1 Ghana’s Financial Structure
Over the last decade, Ghana’s financial system has undergone rapid growth and major structural transformation, bringing new opportunities and risks. An International Monetary Fund (IMF) assessment\(^4\) found that while local authorities have been implementing reforms to strengthen the regulatory and supervisory framework and financial

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\(^4\) International Monetary Fund Ghana, Financial System Stability Assessment Update, Monetary and Capital Markets and African Departments May 2011
infrastructure, stability risks have heightened considerably, with high nonperforming loans and undercapitalized banks. In addition, the nonbanking sector faces several constraints, including a scarcity of long-term finance, limited access to financial services, and high intermediation costs.

The vulnerabilities in the banking sector largely reflect pervasive state involvement and deficiencies in risk management, supervision, and the insolvency regime. Ghana’s financial system is dominated by foreign-owned banks: of the 26 commercially operating banks operating in Ghana, 13 are subsidiaries of foreign banks with a market share estimated at 51% of total bank assets. These foreign banks are mainly British, but in recent years banks from the Africa region, especially Nigeria, have made inroads, particularly in lending to small and medium-sized enterprises (SMEs). Given the dominance of foreign banks, cross-border contagion cannot be ruled out as a risk factor.

3 IFC’s operations in Ghana
Fig. 3 below shows IFC’s investment portfolio in Ghana since 2006, with a significant increase in outstanding finance since 2008. The total outstanding loan amount almost doubled between 2008 and 2009. This is mainly due to more direct investment in the private sector. Only in the last two years have investments in banks also experienced an increase.

![IFC's investment portfolio over time (in $ million)](image)

**Fig. 3: IFC’s investment portfolio over time (in $ million)**

This study quantifies the impact that IFC’s outstanding loans (as of 30 June 2011 $316.9 million) have had on the Ghanaian economy. The results provide a snapshot rather than developments over several years.

IFC financing of the Ghanaian economy flows through financial institutions (FIs) and private sector companies producing goods and services (non-FIs). Table 3a provides a breakdown of these financing flows at a macro level. At a more micro-level, IFC supports local industry by providing financing to a food processing company, an aluminum manufacturer, and a mining company. The services sector is supported by financing to two
educational organizations, three telecommunication providers, a broadcasting company, and a trading firm.

As this study’s approach relies on IFC-related output, $111.5 million invested in the oil industry has been excluded from the analysis. This is because the outputs of that sector had not yet been realized as of 30 June 2011. In addition to the outstanding loan amount, IFC has committed but not yet disbursed some $40 million that has also been excluded from the present analysis.

**Table 3a: Outstanding IFC finance as of June 30 2011 by channel used and receiving sector/party**5 (in $ million)

<table>
<thead>
<tr>
<th>Channel</th>
<th>NON-FIs Outstanding Finance</th>
<th>FIs Outstanding Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>64.9</td>
<td>Banks: 125.2</td>
</tr>
<tr>
<td>Services</td>
<td>124.7</td>
<td>Microfinance: 2.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>189.6</td>
<td>TOTAL: 127.3</td>
</tr>
</tbody>
</table>

**Table 3b: Total outstanding IFC finance as of June 30 2011(in $ million)**

<table>
<thead>
<tr>
<th>Channel</th>
<th>Outstanding Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>316.9</td>
</tr>
</tbody>
</table>

**Background of IFC’s Impact: Ghana Cocoa Project**

IFC has committed to provide a total of $30 million as a guarantee facility to Stanbic Bank Ghana Limited (“Stanbic Ghana”) in the coming years. The partial credit guarantees are given to help Stanbic Ghana increase its short-term working capital credit lines and guarantee facilities to licensed cocoa buyers that purchase cocoa from small farmers in Ghana6. Like other cocoa buyers in Ghana, the Licensed Buying Companies (LBCs) essentially act as buying agents for the Ghana Cocoa Board. The investment program allows IFC to support the Cocoa sector in Ghana, by providing partial credit guarantees to Stanbic Ghana for short-term working capital credit lines and the guarantee facilities that Stanbic Ghana extends to eligible LBCs. With the increased financing, the project aims to enable LBCs to improve their financial management, reduce the overall cost of financing the procurement of cocoa beans, resulting in an increased volume of cocoa purchased from farmers. According to Oscar Chemerinski (IFC Director for Global Agribusiness Department) “the cocoa sector has the potential to create significant rural employment and generate income”. Alhassan Andani (Stanbic Ghana’s Managing Director) believes “IFC’s guarantee facility will help Stanbic Ghana meet the growing funding needs of the Bank’s clients in the cocoa subsector and enable them to adequately prepare for the coming crop season.”

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5 ‘Industry’ comprises mining, manufacturing and utilities (for complete sector definitions please refer to Appendix II)
4 Economic footprint of IFC Ghana

We distinguish between two categories of economic impact: quantifiable socio-economic impact related to the value-added and employment supported by IFC financing; and qualitative impacts, such as those related to advisory services, employee training, and sustainability programs. Though both are discussed, this report’s focus is on the former.

4.1 Methodology description

IFC provides capital to Ghanaian companies and financial institutions, creating direct and indirect economic impacts. Investments in Ghanaian companies have an effect on the direct recipient but also ripple through the economy where they have economic impacts on suppliers, employees, raw materials producers and business services providers, distribution channels, and so forth.

The economic reasoning underlying this study’s approach is that the provision of financing enables the recipient firm in a specific sector, for example, to purchase new machinery. This allows it to grow, increase output and hire new workers. Each direct recipient has connections with suppliers up and down its value chain. As the recipient’s output increases, it requires more input from these suppliers. So as well as the direct recipient, the wider economy also benefits from the capital injection. The financing thus supports value-added (e.g. by transforming raw materials into finished products and thus corporate profits) and employment generation throughout the Ghanaian economy.

Fig. 4 provides an overview of the rounds of impact that arise from injecting capital into an economy, defining direct and indirect impacts\(^7\). Economic convention refers to the final demand that is the result of households re-spending the money they have earned (salaries) in the economy as the “induced” effects. Since economists express some concerns about possible “double counting”\(^8\) of these induced effects, we have not generally included them in our reported employment figures (for more detail on the modeling approach and assumptions made, see Appendix I).

\[\text{Fig. 4: Direct, Indirect 1}^{st}\text{, Indirect 2}^{nd}\text{ and Induced impacts related to IFC financing}\]

\(^7\) The “supply chain” mentioned includes next to input suppliers also distributors and transportation as it refers to all parties involved in producing and selling a good/service

\(^8\) See, for example, William Schaffer, Regional Impact Models (West Virginia University, 1999)
Not all the output of a supported sector can be attributed to the newly provided capital. The injected capital has to be “translated” into associated output. For example, if a company already has one machine and buys a second one with financing from IFC, only 50% of that firm’s total output is associated with IFC.

The starting point of our analysis is the share of the receiving sector’s output that can be related to the investment (the 50% in the example above). How large the related output share is depends on the receiving sector’s specific production function (see Appendix I). In other words, it depends on how productively a recipient uses injected capital. Thus the related output increase leads to higher demand for intermediary products that can in turn be traced through the economy. This leads to the various indirect effects mentioned above. Capital productivity rates are therefore an important input for the model. IFC not only provides capital directly to non-FI’s, but also indirectly via the FI’s that operate in the Ghanaian economy. We therefore need to have productivity rates of non-FIs and FI portfolio clients.

For non-FIs (IFC outstanding finance nearly $190 million) these can be obtained from the production functions of IFC clients for which IFC has balance sheet information. This approach takes per company differences into account.

For FIs (IFC outstanding finance $127 million) balance sheet information for each portfolio company is not readily available. To obtain FI’s productivity rates we have therefore used sector production functions to “translate” that investment into output. The production function of Ghana’s agricultural sector has been obtained by combining FAOSTAT’s capital stock data for Ghana with Central Bank figures of outstanding credit and output figures for the sector. For output-to-capital ratios for industry and services, we refer to the publically available impact assessment conducted by Steward Redqueen for a bank in Ghana. This gives us a more representative ratio, as the portfolio companies of IFC’s FI clients are likely to have a production function similar to that found among this bank’s borrowers. For this previous study, we gathered balance sheet data of the bank’s portfolio companies and differentiated between large corporate, global corporate, and SMEs. This allowed us to utilize different production functions for different types of company. For the current study, we have taken into account the breakdown of the loan books of IFC-related FIs by type of client. We further assumed that IFC’s capital was spread equally over the bank’s entire lending portfolio.

4.2 Strengths and Limitations of Input-Output Methodology
The major advantage of the methodology applied in this study is that it allows one to quantify the wider (direct, indirect and induced) impacts of investing in various economic sectors, both directly and through FIs, and both in terms of associated value-added (or contribution to GDP growth) and jobs. It is a rigorous, widely-accepted academic method (for which Leontief won the 1973 Nobel Prize).

However, it does have the following limitations (see Appendix I for details):

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(i) Given the analysis is conducted for a specific moment in time, it does not take into account any structural changes in the economy (e.g. increased productivity);

(ii) Estimates are based on historical relations (i.e. the most recent macro-economic data available);

(iii) Equity and debt are treated the same way;

(iv) For FI portfolio clients only a limited differentiation is made by size, and hence productivity, of firms within a sector;

(v) It does not take into account the effects of impacts such as IFC’s advisory services (some examples are therefore covered qualitatively in boxes);

(vi) IFC’s investments are treated like investments from any other lender, and it is assumed IFC’s financial support does not affect the relations of sectors within an economy.

Structural changes could be triggered by increasing productivity (e.g. reducing unnecessary or onerous business regulations, or improving power supply or transport infrastructure, will allow many firms to be more productive). Structural changes could also be brought about by increasing worker skill levels. So for example productivity in IFC’s direct real-sector clients would be captured in this study, but productivity improvements of their suppliers would not.

Where IFC works with client companies to strengthen local linkages this would not be captured in this study. We have evidence from a more in-depth evaluation we conducted for a mining project in Ghana (see Section 3.3), that IFC’s supply chain linkage program and community development program contributed to significantly stronger effects on the local economy than is usually seen in mining projects.

The proportion of the firm’s revenues that can then be “attributed” to the outstanding finance is equal to the share or proportion of newly provided financing out of the borrower’s total capital. This means that the various types of financing provided to the recipient (e.g. debt, equity or instruments such as guarantees) have been treated in the same way in terms of their impact on the sector’s capital structure, and thus their ability to generate more output. This is likely to underestimate the impact of equity financing, as this is generally assumed to allow companies to raise additional capital. This particular limitation of input-output modeling will therefore mean results presented are somewhat conservative. Similarly, the approach taken in this study does not allow differentiation between long- and short-term finance provided.

As the model relies on sector average productivity rates, differentiating the impact of investing in different sizes of company (e.g. large corporates, which are generally more productive, compared with investing in smaller SMEs) cannot be addressed. The same applies to direct financing versus indirect financing via FIs, where company size is one of the factors explaining the different extent of related impacts.

IFC’s advisory services can help improve the investment climate, increase access to finance and infrastructure, attract private investment into sectors previously often dominated by the public sector, and strengthen the operations and local linkages of IFC.

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Assume a company has assets with a book value of $100, revenues of $200 and a loan from IFC of $15, this would mean that 15% of 200 = $30 in revenues are attributed to IFC. Technically this assumption implies that the asset turnover (sales/assets) of companies remain constant when the company grows.
client companies. We have not tried to capture these effects quantitatively, but clearly they can be significant and we provide some qualitative descriptions of such projects.

Finally, IFC’s investments are often “first-of-a-kind” investments (e.g. Queen Alia International Airport and IFC’s investment in the Ghanaian oil industry). These can have important demonstrative effects, leading to subsequent investments (e.g. further development of an industry; similar “public-private partnerships” in other sectors; etc). These effects were not quantitatively captured in this study, but could clearly be significant. Therefore where IFC can bring about such “transformations”, either through investments or advisory services, other assessment methods will be more appropriate.

4.3 Economy-wide value-added of IFC Finance
Table 4 shows how IFC’s investment relates to the output of the recipient firms. The share of total revenues of the various sectors and firms that is attributable to IFC is to a large extent determined by the capital-output ratio of the sector’s and firm’s production function. One unit of capital added to a capital-intensive company (or sector) naturally has relatively little effect compared to one unit of capital added to a relatively capital-scarce company (or sector). Just as giving $1 to someone who earns $1 per day makes him twice as rich, while giving $1 to a person who earns $1,000 a day changes his wealth very little. In this study, the output per capital ratios for non-FI clients are based on balance sheet data per company, while ratios for FI portfolio clients are sector average figures based on macro-economic figures (see Section 4.1 for detail).

Table 4: “Translation” of IFC input (as of June 30 2011) into client output

<table>
<thead>
<tr>
<th>in $ mln</th>
<th>Attributable Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outstanding Finance</td>
</tr>
<tr>
<td>TOTAL</td>
<td>316.9</td>
</tr>
</tbody>
</table>

Table 4a: non-FIs (in $ millions)

<table>
<thead>
<tr>
<th>in $ mln</th>
<th>NON-FIs</th>
<th>Attributable Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outstanding Finance</td>
<td>Output per Capital Ratio</td>
</tr>
<tr>
<td>Industry</td>
<td>64.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Services</td>
<td>124.7</td>
<td>0.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>189.6</td>
<td>-</td>
</tr>
</tbody>
</table>

12 The output per capital ratios indicated here are the average figures for all underlying portfolio companies, not the weighted average.
Comparing the output per capital ratios for non-FI and FI companies, it becomes obvious that FI portfolio clients are less productive. That means that in those companies relatively more capital is needed to produce one unit of output. It shows that those companies are less capital intensive than non-FI clients which tend to be bigger multinational firms with higher productivity levels. This is especially true for the efficiency difference between non-FIs and firms supported by microfinance institutions and SMEs in the portfolios of FIs. Portfolio clients of FIs tend to include more typical Ghanaian firms: smaller and less capital intensive. IFC does not directly invest in SMEs in Ghana, as it does not have the capacity to assess the viability, but targets SMEs through its FI investments, as it is assumed FIs operating locally have the capacity to assess the needs of SMEs.

Table 4b: FIs (in $ millions)

<table>
<thead>
<tr>
<th>Client Segment</th>
<th>Outstanding Finance</th>
<th>Output per Capital Ratio</th>
<th>Output Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>6.0</td>
<td>3.1</td>
<td>18.3</td>
</tr>
<tr>
<td>Industry</td>
<td>41.2</td>
<td>1.4</td>
<td>59.0</td>
</tr>
<tr>
<td>Services</td>
<td>60.2</td>
<td>2.1</td>
<td>104.7</td>
</tr>
<tr>
<td>Households</td>
<td>7.4</td>
<td>-</td>
<td>7.4</td>
</tr>
<tr>
<td>Government</td>
<td>12.5</td>
<td>-</td>
<td>12.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>127.3</strong></td>
<td>-</td>
<td><strong>201.9</strong></td>
</tr>
</tbody>
</table>

Taking the output attributable to IFC’s investments presented in Table 4 as the starting point, Fig. 5 provides an overview of the direct, indirect and induced impacts of IFC’s financing in Ghana. This has been done by tracing the attributable output to the Ghanaian economy.
Fig. 5: Breakdown of value-added supported by IFC’s investments ($ millions)

When companies use IFC’s investment to increase output, and thus procure goods and services in the local economy, value-added creation takes place among the suppliers who thereby indirectly benefit from IFC’s investments. This is captured in the 1\textsuperscript{st} indirect round of impacts. Taking all ripple effects into account, the total value-added supported by IFC’s investments in Ghana is at least $235 million. This is about 0.7% of Ghana’s GDP (see Table 2).

Some 52% of the total value-added impact shown in Fig. 5 arises directly in the non-FIs or portfolio companies of the FIs. $56 million comes from the value chains (Indirect 1\textsuperscript{st}) of the direct recipients, and $24 million is related to the suppliers of the direct recipients’ suppliers (Indirect 2\textsuperscript{nd}). Households in Ghana benefit the most from IFC’s investments as can be seen from the 64% ($151 million) of total value-added generated in the form of salaries to employees. 26% ($60 million) of total value-added are profits to companies and the government benefits from the remaining 10% ($24 million) in the form of taxes.

Compared to the results found in the socio-economic impact assessment of IFC financing in Jordan, in Ghana household income makes up a larger share of total value-added (64%) than in Jordan (40%). Profits for private sector companies are 26% of total value-added in Ghana and 47% in Jordan. This is because Jordan is a more developed country than Ghana (GDP per capita in Ghana is $1,325, in Jordan $6,000\textsuperscript{13}). The development level suggests that relatively more firms in Ghana are run by the owner, where distinguishing between private salaries and firm’s profits is less straightforward.

To gain some insights into the sectors of the Ghanaian economy that benefit from IFC’s investment, Fig. 6 provides an overview of the total value-added related to IFC’s non-FI lending per sector. IFC’s classification distinguishes more sectors than the sectoral division but has not been applied in this exercise. The capital and labor productivity rates that would be required per sector are only available at a less detailed level. While the GTAP

\textsuperscript{13} World Bank Database
database differentiates 57 sectors, macro-economic employment figures are only collected for 11 sectors, among which crops, livestock and forestry. Data on jobs per economic sector is essential when determining the labor productivity per sector. Though desirable, given the lack of employment data, it is therefore not possible to break down the sectors at a more detailed level. For non-FI investment, where capital productivities are known at a firm level (see Section 4.1), the impact can thus be distinguished for 11 sectors (here crops, livestock and forestry have been grouped to agriculture getting 10 sectors in total). In principle, the same limitation holds for FI investment, though for the impact of direct investment only three sectors (agriculture, industry and services) can be differentiated due to limited information on capital productivity rates on sector level that takes into account productivity differences between different firm sizes. This means that the direct effects of FI investing are bundled in the three main sectors, whereas in reality FI portfolios are broader spread.

**Fig. 6: Value-added per economic sector and channel ($ millions)**

The total of $235 million corresponds to the total value-added supported by IFC’s financing as in Fig. 6 ($296 million including induced effects), whereby most value-added arises in the business services sector. The sectoral breakdown of value-added supported by IFC investments is influenced by IFC’s initial decision to invest in specific sectors (non-FIs), as well as by the loan book spread of FIs. This is reflected in the direct impact of IFC’s investment presented in Fig. 7, but also indirectly in the supplier and distribution rounds of impact. The impact seen in these rounds depends on the spending patterns of individual sectors, in particular on the extent of local linkages of sectors. Naturally, sectors differ in their procurement patterns, buying more from some industries than from others, leading to varying degrees of backward linkages arising from initial investments. The value-added results are further influenced by the productivity of individual sectors.

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14 “Industry” comprises manufacturing, mining and utilities; “Services” refers to banking, business services and public services. For full definitions of sectors see Appendix II.
To the extent that investment decisions are made with the aim of strengthening local supply chains, Fig. 7 gives some indication which sectors are more suitable than others. It suggests there are no indirect effects from mining. This is because other sectors do not have relevant backward linkages (i.e. do not generally procure) from mining. We can conclude that, local (backward) linkages from mining are less pronounced: about 60% of impacts arising from investing into mining arise directly. An earlier detailed study conducted on the impact of a mine in Ghana showed that only 40% (including induced impacts 31%) of all value-added effects arise directly. The difference arises because in this study we work with sector average figures, while at a company level study company-specific differences can also be taken into account.

**Impact of IFC’s Advisory Services:**
**Expanding MSMEs Financing in Ghana through Collateral Reforms**

In 2008, Ghana embarked on a reform of its movable collateral framework to encourage Medium, Small and Microenterprise (MSME) financing against valuable movable property. Prior to the reform, Ghanaian law was a key constraint for MSME access to credit, as bank lending was largely based on real estate collateral, assets that MSMEs typically lack. After enactment of the new law, the Bank of Ghana, with the support of IFC, established a collateral registry which has recently been upgraded into a web-based electronic registry that started operating on June 25, 2012.

As a result of the reform, the volume of financing for MSMEs has increased: more than 36,000 loans have been registered by Banks and non-bank financial institutions (NBFIs) in the collateral registry since its creation in March 2010. As of December 2011, these loans accounted for more than $2 billion in financing secured with movable property. More than 2,000 SMEs and around 10,000 micro businesses and individual entrepreneurs have received loans. A large number of end-beneficiaries are women entrepreneurs and Women’s World Banking is one of the main users.

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15 Figure 7 shows the impact of IFC’s portfolio on mining but not the impact IFC has with its mining investments.

of the collateral registry.

In addition, businesses and MSMEs are now using a wider variety of collateral beyond real estate, including: inventory and accounts receivable (in 30% of the loans); investment instruments such as shares, cash, bonds and deposit accounts (18%); household assets (12%); motor vehicles (14%); real estate property (10%); and machinery, equipment, all enterprise assets and other (16%). Of the 52 financial institutions in Ghana, 39 (17 banks, 16 NBFIs, 4 foreign-based banks and 2 rural banks) have registered with the collateral registry and granted loans secured with movable property. However, a considerable number of the rural and community banks have still not benefitted from the new infrastructure.

IFC, together with the Swiss State Secretariat for Economic Affairs (SECO), assisted the Bank of Ghana in its attempt to raise the standards and practices of the Collateral Registry by completing a fully automated, web-based, state-of-the-art Secured Transactions Registry whose services are accessible to all.

4.4 Economy-wide employment of IFC Finance

Ghana Statistical Services (GSS) publishes the Ghana Living Standards Survey which provides information on “Employees and Enterprises by Economic Activity”, covering the size and allocation of Ghana’s employed labor force. The most recent information available is from 2006 but can be updated to 2010. Output per sector figures are calculated from GDP per sector figures (2010) obtained from the GSS. Based on these two inputs we determine the employment intensity for 11 sectors in the Ghanaian economy. Please note that the revaluation of Ghana’s output figures as presented in 2010 has been taken into account. It is not possible to draw any conclusions about the level of education, gender or age of employees as this data is not available.

Employment supported by IFC’s investments in Ghana has been determined based on these inputs and the results shown in Fig. 8. We emphasize that the total impact of 36,700 associated jobs (0.4% of employed labor force) reported here excludes 13,200 jobs that are related to the induced effect of re-spending of household incomes.

17 With RAS method, a technique that applies row and column balancing factors iteratively until the adjusted matrix (the transactions table) satisfies the row and column totals (commodity and industry output)
Most of the jobs supported by IFC’s finance arise in the agricultural sector. This is rather due to the labor intensive nature of that sector than because of the initial investment decision. Employment intensities indicate how much labor is employed to produce one unit of output. Labor-intensive sectors, like the agricultural sector, have a relatively higher intensity. Keeping in mind the total amounts invested in non-FIs ($189.6 million), compared with the amount invested in FIs ($127.3 million) shown in Table 3, the number of jobs supported by one unit of capital invested through the two different channels varies quite significantly. In particular, we find that financing provided to FIs is generally associated with more jobs than financing provided to non-FIs. FI portfolio firms are, on average, more labor-intensive, with additional output mainly produced by more labor. These companies also tend to be less capital-abundant, meaning that injecting one unit of capital contributes relatively more than in companies that beforehand were more capital-intensive. For non-FIs, we know from IFC’s tracking system DOTS\(^\text{18}\) that such firms are typically more capital-intensive than the average Ghanaian firm.

To summarize, the production functions of sectors and firms determine the extent of impact arising from investments into those sectors/firms. The multipliers per channel and economic sector are discussed in more detail in Section 4.5, which also compares results found for Ghana and Jordan.

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\(^{18}\) Development Outcome Tracking System (www.ifc.org/results)
Job creation is not only about the absolute numbers of employed workers (Figs. 8 & 9), but also the value-added per job (Fig. 10). Obviously job creation is crucial to poverty reduction, but long-term development requires increasing productivity and value-added per job. Policymakers therefore face a tradeoff between the amount of employment and the type of employment generated. In short, not all jobs are equally productive. The average GDP per worker in Ghana is $2,600\textsuperscript{19}. Not surprisingly, due to the labor intensive nature of the trade and agricultural sectors, workers employed in these sectors generally contribute less to Ghanaian GDP than those in industry or business services.

\textbf{Fig. 10: Value-added per job in various sectors (in $)}

\textsuperscript{19} GDP 2010 ($27 billions)/ employed labor force 2010 (1,043 millions) = $2,600 GDP/worker
Fig. 10 shows the value-added per job in Ghana. As we can see, it reveals the tensions that can exist between employment creation on the one hand and value-added on the other. The construction industry, for example, receives relatively little IFC finance (it is shown as a thin slice in the Exhibit) yet is high in value-added. Agriculture, by contrast, generates many jobs but these are below the Ghanaian average\(^\text{20}\) of GDP contribution per worker. While in Fig. 10, which shows the overall average of investments regardless of channel used, the same tensions arise when investing into FIs but generally the multipliers for that investment channel are larger. For readability, the number of sectors shown is limited.

### Impact of IFC’s Advisory Services: Africa Schools Ghana Program

According to IFC commissioned market research, private schools are playing a crucial role in the educational system in many developing countries by supporting governments in their commitment to providing quality education for all. Most of them are, however, limited in their ability to provide quality education services due to their lack of access to appropriate financial and business advisory services to help them improve their operations. Together with The Trust Bank (TTB), IFC implemented the Africa Schools Ghana Program which seeks to overcome these obstacles by improving access to finance for private sector educational institutions and providing advisory services.

Through a risk-sharing facility, IFC worked with The Trust Bank (TTB) to expand its portfolio of lending to the private schools sector. IFC provided a risk-sharing facility of up to $4.40 million to TTB on medium-term loans extended to eligible private schools. These loans were used to finance construction, purchase of educational materials and other capital expenditures. This enabled the bank to develop a medium-term lending program for private schools that supported 26 schools in assessing finance. The total cumulative loan approved equals $7.34 million. 2 other partner schools obtained financing of US$1.99 million from Ecobank Ghana. Bringing the total loan disbursed to US$9.33 million. An additional 2 partner schools obtained financing from other financial institutions.

To support the financing facility, customized school-level advisory services were provided, comprising: (i) the preparation of business plans for schools to access financing, (ii) the organization of training programs, (iii) development of HR and corporate governance manuals and (iv) implementation of education management information systems. The advisory service program was designed to support and strengthen the financial, managerial and educational capacity of each beneficiary school, as well as improve the business environment of private education. Ultimately leading to an improved private education sector in Ghana.

In total 334 schools benefited from the Africa Schools Ghana Program program’s sector-wide training program aimed at building participants’ capacity. Of these, 300 with a total 1,400 participants were based in six cities: Accra, Kumasi, Ho, Sunyani, Takoradi and Tamale. Training topics included: (i) school self-diagnostic & strategic planning, (ii) curriculum & learning management, (iii) best practice financial management for private schools, (iv) interactive teaching & learning and (v) succession planning. A total of 50 sector-wide training programs were organized in the six cities above. 68 schools were also assisted with the preparation of business plans, of which 26 have accessed financing from the partner bank, TTB, and another 4 accessed financing from Ecobank Ghana and other financial institutions. 20 schools have received in-depth support with the implementation of education management information systems, development of human resource and corporate governance manuals, and direct school-specific training programs.

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\(^{20}\) Given GDP and employment per sector figures obtained from Ghana Statistical Services (Ghana in Figures & Household Survey)
The program has impacted an estimated 100,000 students in Ghana and been replicated in Kenya, Rwanda, Uganda and Liberia.

4.5 Value-added and employment generation multipliers
The multipliers presented in Tables 5 and 6 summarize the previous discussion by indicating how much value-added and employment is generated throughout the local Ghanaian economy (direct and indirect with induced effects provided separately) by investing $1 million of finance into various economic sectors. The job multipliers in absolute figures presented below refer to direct and indirect jobs supported per $1 million provided. Taking into account the induced effects (presented as percentages of the direct/indirect multipliers), the total employment and value-added multipliers per $1 million outstanding lending (direct + indirect + induced) can be calculated. So, for non-FIs, the total jobs multiplier would be 40 + (46% *40) = 58. Meaning that on average 58 jobs are supported by providing $1 million to the Ghanaian economy when invested directly (non-FI client). The same multiplier definition applies to the value-added and FI multipliers.

Table 5: Value-added and employment supported by financing of $1 million

<table>
<thead>
<tr>
<th>Channel</th>
<th>Economy-wide value added related to $1 million ($ millions)</th>
<th>Economy-wide employment related to 1 $ million (number of jobs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct/Indirect</td>
<td>Induced effect</td>
</tr>
<tr>
<td>NON-FIs</td>
<td>0.34</td>
<td>+ 26%</td>
</tr>
<tr>
<td>FIs</td>
<td>1.34</td>
<td>+ 26%</td>
</tr>
<tr>
<td>Weighted Average</td>
<td><strong>0.74</strong></td>
<td><strong>+ 26%</strong></td>
</tr>
</tbody>
</table>

The multipliers suggest that investing in an economy via financial institutions contributes more to employment and GDP creation than direct investment into non-FIs. The differences are bigger for employment creation than for GDP contribution. The economic reason for the different magnitude of multipliers presented above is that, compared with selecting individual large corporations for non-FI investment, the portfolios of FIs have a broader spread across the local economy and are not focused solely on the largest corporations. Direct investment into non-FIs is mainly focused on a few large, capital-intensive companies. Adding one additional unit of capital here has only a marginal effect on additional value-added and job creation. The effects are larger for employment creation as smaller businesses in the portfolios of FIs tend to be more labor-intensive than capital-intensive, suggesting lower GDP contribution per job (Fig. 10).
This economic reasoning also applies to the multiplier differences that arise between sectors. Table 6 shows how the relatively capital-scarce agriculture sector has higher multipliers compared with more capital-intensive sectors like manufacturing. Higher marginal returns on capital in the agricultural sector can be explained by the fact that it takes relatively little capital to increase efficiency and productivity in this sector. Typically, the sector encounters difficulties accessing finance as it is less formalized than for example the industrial sector, and because property rights are more problematic. If one was to differentiate the multipliers for non-FI and FI finance provided to various sectors, the extent of the multipliers would still depend on productivity differences between companies financed.

Compared with the results of the socio-economic impact assessment conducted in Jordan, the employment multipliers found for Ghana are considerably higher. For two reasons. First, 60% of IFC financing in Ghana is to FI clients and 40% to non-FI clients. In Jordan 80% of all outstanding finance has been to non-FI clients. As explained in Section 4.3, financing FIs generally supports more employment than financing non-FI clients. Secondly, there are higher multipliers in Ghana because Ghana is more labor-intensive.

As pointed out earlier, the multipliers as presented above do not take into account any transformational effects of IFC finance, since these cannot be quantified using the suggested approach. The World Bank Group’s Enterprise Surveys however offers another way of evaluating the impact that IFC investments into Ghana might have.

Almost 70% of local firms identify access to finance as a major constraint to doing business. This is higher than the figure of 45% for Sub-Saharan companies as a whole. Suggesting that lack of financing is an even larger problem in Ghana than elsewhere in Sub-Saharan Africa. We can therefore assume that providing finance will have substantial catalytic effects on the country’s development. In addition, 90% of companies regard the supply of electricity as a major constraint to growth. So investing in power plants can be considered extremely relevant to improving the circumstances in which businesses operate. Contributing to value-added creation relatively more than the multiplier in Table 7 suggests.

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Table 6: Value-added and employment supported by $1 million financing

<table>
<thead>
<tr>
<th>Client Segment</th>
<th>Economy-wide value added related to $ 1 million ($ millions)</th>
<th>Economy-wide employment related to 1 $ million (number of jobs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct/Indirect</td>
<td>Induced effect</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2.57</td>
<td>+ 29%</td>
</tr>
<tr>
<td>Industry</td>
<td>0.69</td>
<td>+ 27%</td>
</tr>
<tr>
<td>Services</td>
<td>0.79</td>
<td>+ 25%</td>
</tr>
<tr>
<td>Weighted Average</td>
<td>0.74</td>
<td>+ 26%</td>
</tr>
</tbody>
</table>

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Table 7: Major business constraints as identified by Ghanaian firms

<table>
<thead>
<tr>
<th>% of firm identifying as a major constraint:</th>
<th>Ghana</th>
<th>Sub-Saharan Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Finance</td>
<td>66.2%</td>
<td>44.9%</td>
</tr>
<tr>
<td>Electricity</td>
<td>86.2%</td>
<td>49.2%</td>
</tr>
<tr>
<td>Transportation</td>
<td>17.6%</td>
<td>26.9%</td>
</tr>
</tbody>
</table>

Presented with a list of 15 business environment issues, managers of 494 Ghanaian firms identified the biggest obstacles to their business, results can be seen in Fig. 11.

![Bar chart showing business obstacles in Ghana](chart.png)

**Fig. 11: Business obstacles in Ghana (percent of firms)**

It can be seen any IFC investments in power plants potentially have “transformational” effects, as any improvement in power supply positively contributes to the long-term development of the country. IFC does not currently directly invest in any electricity projects in Ghana. However, it could be argued that IFC contributes positively to the business environment in other respects. IFC is, for example, investing in a micro-finance institution and a mortgage bank for private households. These initiatives arguably support access to finance. Technical assistance provided to financed companies also has the potential to deliver “transformational” effects by helping tackle issues faced by local companies.

**Impact of IFC’s Advisory Services:**

**Empowering Local SMEs to Provide Services to Mining Corporations**

One practical case where the newly set-up secured transactions system and the enhanced financial infrastructure has helped SMEs in Ghana is the Purchase Financing Scheme for Gold Mining set up by CAL Bank. The objective was to develop a local supply chain for big mining corporations, through local SME service providers interested in providing goods and services to the big mining multinationals. The main highlights of this program include:

- More than 100 Ghanaian SMEs providing different types of services have benefitted through the program by obtaining loans to provide specific services to the mining companies.
- Local SMEs are now providing services such as catering, repair and mechanic services, electricity and power generation, transportation services, as well as providing goods such as

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lighting equipment and other materials to the mining corporations.

- Local SMEs are using their movable assets, such as receivables from the mining companies, vehicles, equipment and inventory as collateral for loans to expand and operate their businesses.
- These local SMEs have created hundreds of jobs from business growth as a result of these new mining clients.
- Over US$ 10 million in financing has been provided by CAL Bank to these SMEs since the program started with zero NPLs in the 30 months the program has been in operation.

Whereas up to now we have focused on IFC’s impacts related to its investments, the following two sections focus on the overall economic impact from IFC clients and the contribution of third party finance that could be mobilized with the help of IFC. They therefore do not focus on the additional output achieved through IFC’s investment, but analyze the impacts of the entire output of a firm.

5. Overall impact of IFC non-FIs Clients

Whether or not financially supported by IFC, companies operating in the Ghanaian economy impact their local environment by purchasing local goods and services, paying taxes and employing local people. Figs. 12 & 13 show the estimated impact supported by the total operations of all non-FI clients of IFC in Ghana. The starting point for this analysis is the entire output of the companies (not, as in Fig. 5, IFC related output only).

**Fig. 12: Overall value-added of non-FIs supported by IFC (in $ million)**

Determined by the output share attributable to IFC, IFC’s contribution to the overall impact of non-FI companies on the Ghanaian economy is about 7%. This can be surmised by comparing the $64 million of related value-added presented in Fig. 6 with the $917 million presented in Fig. 12. It is also in line with the share of IFC’s outstanding loan amount as a percentage of the total assets of non-FI clients (5%) and the share of IFC-related output of the total output of the clients (5%).
Figs. 12 and 13 focus on the effects of non-FI clients only, as data was readily available. For FI portfolio companies, quantifying the extent to which their entire output contributes to value-added and employment creation would require an investigation of balance sheet information of each portfolio company, which is beyond the scope of this study.

**Fig. 13:** Overall employment supported by non-FIs supported by IFC (in ’000 jobs)

The sectoral spread of direct jobs supported is determined by the initial investment decision on which sectors obtain the financing. For example, IFC is not directly investing in agriculture in Ghana and thus no direct agricultural jobs are supported. Again, the extent to which backward linkages from direct investments occur is crucial for the sectoral division of indirect jobs supported.
6. The combined impact of IFC and “participant” financing

IFC’s investments can have an “additionality” effect on clients by mobilizing funds from third party investors (so-called “participants”) to these companies. In Ghana, these participants had $39 million (as of June 30 2011) of finance outstanding with IFC clients in the mining and trade sectors.

Also taking these loans into account, Fig. 14 shows the combined impact supported by IFC’s and the mobilized third party capital. The catalytic effect that IFC might have on participant finance cannot be quantified with sufficient certainty. Consequently the extent to which the total effect can be attributed to IFC can only be estimated. The attribution question is therefore beyond the scope of the present study.

As the output of the client companies that can be attributed to IFC and the third party participants is naturally larger than the output that can be related to IFC alone, the values presented in Fig. 14 are larger than the ones presented in Fig. 7.

*Fig. 14: Value-added by IFC and Participant finance (in $ million)*
7. Conclusions

The objective of this study was to rigorously quantify the impact of IFC financing on the local Ghanaian economy. Further, the study focused on providing insights into the various channels of IFC’s involvement, including: direct loans to private sector companies; indirect financing of firms through support to financial institutions (which in turn provide lending); the mobilization of third party or participant capital; and the provision of advisory services that improve the business environment.

We find in particular that IFC generates the highest multipliers in terms of employment and value-added when it lends to the financial sector, which in turn provides loans to a broad sample of Ghanaian companies. Direct lending by IFC to private sector firms, in contrast, tends to focus on large, capital-intensive companies. Further, we find that the multipliers associated with some sectors are larger than with others. The relatively capital-starved agriculture sector, for example, enjoys high multiples with each incremental addition of capital. These findings point to the recommendations in the following section.
8. Recommendations

This Report highlights the economic contributions that IFC makes to employment and value-added in Ghana. These impacts are felt through different channels, including direct investments in industrial firms; support to the financial sector, which in turn lends to the real economy; and a variety of technical assistance programs. If IFC wishes to increase its impact, it might want to consider the following recommendations:

1. To the extent that IFC seeks to deploy its capital to generate more employment in Ghana, it needs to recognize the tension between financing well-capitalized companies directly and providing financing to the banking sector that then provides loans to capital-needy firms. Financing well-capitalized companies directly increases labor productivity, but generates relatively few additional jobs. Financing the banking sector to provide loans to capital-needy firms enables those firms to bolster output and create, on average, more jobs throughout the economy. Even though the immediate effect of financing provided to private companies directly is less, it has the potential to increase productivity and lead to “transformational” effects in the long-run.

2. Given its relatively high level of job multipliers, IFC should consider playing a more active role in the agricultural sector, which for various structural reasons faces limited access to capital.

3. To the extent IFC wishes to strengthen linkages in the local supply chain, investing in manufacturing or business services, where there are more spill-over effects, seems more suitable than agriculture and mining.

4. IFC should seek to quantify the effects of its advisory services, some of which could be significant. By promoting a collateral framework for SMEs, for example, IFC may have contributed significantly to that sector’s growth and development. Similarly, by assisting the private school sector in Ghana, IFC contributes to human capital formation. Quantifying these effects could help IFC management allocate resources more efficiently to meet its objectives.

5. Given that IFC operates within an economic environment shaped partly by government policy, it should continue to urge the Government to promote an environment that encourages business investment and risk-taking.
Appendix I Model description

I.1 Modeling approach
The approach developed for this study is based on the socio-economic impact assessment (SEIA) models. It combines outstanding IFC loan data with a so-called Social Accounting Matrix (SAM) of the Ghanaian economy and the allocation of the workforce over the various economic sectors. A SAM describes inter-industry linkages in an economy, showing how the output of one industry goes into another as an input. It therefore essentially makes one industry dependent upon another, both as customer of outputs and as supplier of inputs. Fig. I.1 depicts an overview of the modeling approach, including the information sources used to arrive at the two main model outputs.

Fig. I.1: Overview of the modeling approach

I.2 Production Function
IFC’s outstanding financing has been “translated” into company output based on the firm production function that depends on the company’s capital structure. A production function describes the firm’s economic output as a function of its inputs, namely capital and labor: \( P = f(L,K) \). Although classic production functions are written in terms of physical outputs, we have used economic output in order to more easily incorporate different firms. Labor (L) has been measured in terms of Full Time Equivalents (FTEs) and Capital (K) has been defined as Capital Employed (defined as total assets in $).

Due to data constraints we used a Leontief (Linear) or fixed production function, a simpler model for which only current data is needed. The more accurate, but also more complex and data-intensive Cobb-Douglas Production Function, would have been an alternative.

All expenditure necessary to produce the output share related to IFC can then be traced through the Ghanaian economy to estimate the associated value-added and employment supported.
For FIs, IFC’s financing was allocated over different economic sectors, according to the
lending portfolios of the FIs in which IFC invested. For each sector an “economy-wide”
production function was used to determine the direct impact of IFC’s capital, which was
then treated as output generated at non-FIs. We have not conducted any interviews with
borrowers of FIs. Value-added and employment effects, supported by financing provided
to FIs, have been quantified relying on macro-economic production functions per sector
based on local statistics. The additional output related to IFC’s investments based on the
production functions has then been followed through the economy. This is because
intermediary products and distribution services were necessary to produce/ship this
additional output. The basis for this exercise was the SAM as described under I.3.

The size of the FI portfolio companies has not been taken into consideration. Size plays a
role in productivity levels, but given the data available for Ghana, this study is based on
average productivity levels per sector. However, a distinction has been drawn between the
economy’s formal and informal sectors. We assumed that directly supported non-FI
companies and most FI portfolio companies are formal sector companies, while their value
chain partners and those partners’ suppliers are informal sector companies with higher
labor intensities.

I.3 Social Accounting Matrix
The key ingredient of the model is the Social Accounting Matrix (SAM). The SAM describes
the financial flows of all economic transactions that take place within the Ghanaian
economy. It is a statistical and static\(^{24}\) representation of the economic and social structure
of Ghana. As shown in Fig. I.2, in the SAM the number of columns and rows are equal
because all sectors or economic actors (industry sectors, households, government and the
foreign sector) are both buyers and sellers. Columns represent buyers (expenditures) and
rows represent sellers (receipts).

Of the four quadrants in the SAM, three are relevant here. Final consumption induces
production which leads to financial transfers between the various sectors. This then
generates incomes for households, governments (taxes) and profits (dividends and
savings). For Ghana, the most recent SAM dates back to 2007 and has been taken from
the GTAP\(^{25}\) database. Using data from the Ghana’s Statistical Services\(^{26}\), the SAM has
been updated for the year 2010.

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\(^{24}\) SAMs are valid for a specific year. Economies are subject to change and SAMs must be updated periodically.

\(^{25}\) Global Trade Analysis Project (www.gtap.agecon.purdue.edu).

\(^{26}\) http://www.statsghana.gov.gh/
The last step in constructing the SAM is to normalize it, such that all columns add up to one. Then spending of IFC clients can be traced in money terms throughout the economy. In so doing, the economic effect of the presence of IFC can be divided into three effects:

1. **Direct effects**: effects arising directly from clients financed by IFC and FI portfolio companies (e.g., jobs and salaries paid by direct clients/portfolio companies).
2. **Indirect effects (1st tier trade partners)**: effects arising from suppliers of IFC clients/portfolio companies that result from spending by direct beneficiaries to produce IFC related output.
3. **Indirect effects (2nd tier trade partners)**: effects arising from suppliers of suppliers directly cooperating with IFC’s clients/portfolio companies (e.g., jobs and salaries provided by suppliers’ suppliers).
4. **Induced effects**: effects due to the increased expenditures of households enabled by the increasing incomes generated by the direct and indirect effects. These have been separated out due to concerns about potential “double-counting.”

### I.4 Assumptions

1. **Constant returns to scale, constant technology and constant capital & labor productivity**

For all sectors, the Social Accounting Matrix (SAM) implicitly assumes Leontief (linear) production functions in which the inputs increase proportionally with output. Across the economy and over not too long a period, this assumption is possibly not overly restrictive, as new technologies and business practices take time to translate into higher productivity. Input-output modeling is not capable of reflecting transformative change such as comes with, say, the introduction of cell phone or internet technology. For this reason, SAMs are periodically (or sometimes sporadically) updated. Only by studying the change of SAMs over time can one infer the effect of transformative technology of business practices. If one were to update the SAMs every five years or so, and assume technology was constant during the period, one would incorporate the transient change of technology in a quasi-steady way. This, however, would not quantify IFC’s contribution to this (transformative) technology change. In input-output modeling, the marginal capital and labor productivities...
are equal to overall capital and labor productivity. Although in reality one would expect diminishing marginal returns to scale, the lack of skills and capital typically present in emerging markets probably mean that this is a reasonable assumption. For firms with good access to finance (possibly IFC clients), however, the assumption is more restrictive. Using, as proposed, Cobb-Douglas production functions for these companies will improve results but only in terms of the “direct” impacts.

2. Different products within one sector have identical cost structures
Although economies of scale and scope surely influence the production process within an individual company, we assume that production processes are not too dissimilar across a sector. This restrictive assumption could only be relaxed with more disaggregated data.

3. Demand is totally inelastic and input structures are fixed
In a SAM, the use of inputs does not depend on price but only on final demand. Unreasonable as it may sound, this assumption may not be overly restrictive unless one supposes that firms are price-makers instead of price-takers. More restrictive is that the production function relies on a fixed proportion of inputs (i.e. no substitution takes place). Again, this may not be problematic over a given time-horizon.

4. Supply of inputs is totally elastic
Supply of labor intensive products can be expected to be fairly elastic for unskilled labor. For skilled labor this would be more problematic. Inputs from capital intensive industries will typically violate this assumption, as capital is typically scarce in emerging economies and economic impact would then be overestimated.

5. Time invariance
Input-output modeling yields a “snapshot in time”. In a sense, it is as if the effects of any IFC intervention result in a new “steady state” immediately. In reality, of course, it would take a substantial amount of time for these effects to percolate through the economy. In other words, the methodology produces a snapshot of the economy and does not take the date of a financing intervention into account.

To model these kinds of time changes one would need to apply Computational General Equilibrium (CGE) models. These models are however much more data intensive and it is highly unlikely that one could apply them in most emerging economies. Even if one could, inaccuracies in the data would probably multiply to the point where any results would be highly questionable. In addition, attribution of any changes to IFC become increasingly difficult as time proceeds, as a growing number of exogenous and endogenous events will exert their influence. Obviously, the results should be assessed accordingly.
Appendix II: Overview of sectors
Below you see an overview of the sub-sectors included in each sector used in this report.

<table>
<thead>
<tr>
<th>Agriculture</th>
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<tbody>
<tr>
<td>Paddy rice</td>
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<tr>
<td>Wheat</td>
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<td>Cereal grains</td>
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<tr>
<td>Vegetables, fruit, nuts</td>
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<tr>
<td>Oil seeds</td>
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<tr>
<td>Sugar cane, sugar beet</td>
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<tr>
<td>Plant-based fibers</td>
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<tr>
<td>Crops</td>
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<tr>
<td>Bovine cattle, sheep and goats, horses</td>
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<tr>
<td>Animal products</td>
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<tr>
<td>Raw milk</td>
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<tr>
<td>Wool, silk-worm cocoons</td>
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<tr>
<td>Forestry</td>
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<tr>
<td>Fishing</td>
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<thead>
<tr>
<th>Industry (Manufacturing/Mining/Utilities/Construction)</th>
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<tbody>
<tr>
<td>Coal</td>
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<tr>
<td>Oil</td>
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<tr>
<td>Gas</td>
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<tr>
<td>Minerals</td>
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<tr>
<td>Bovine meat products</td>
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<tr>
<td>Meat products</td>
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<tr>
<td>Vegetable oils and fats</td>
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<tr>
<td>Dairy products</td>
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<tr>
<td>Processed rice</td>
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<tr>
<td>Sugar</td>
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<td>Food products</td>
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<tr>
<td>Beverages and tobacco products</td>
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<tr>
<td>Textiles</td>
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<tr>
<td>Wearing apparel</td>
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<tr>
<td>Leather products</td>
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<tr>
<td>Wood products</td>
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<tr>
<td>Paper products, publishing</td>
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<tr>
<td>Petroleum, coal products</td>
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<tr>
<td>Chemical, rubber, plastic products</td>
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<tr>
<td>Mineral products</td>
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<tr>
<td>Ferrous metals</td>
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<tr>
<td>Metals</td>
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<tr>
<td>Metal products</td>
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<tr>
<td>Motor vehicles and parts</td>
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<tr>
<td>Transport equipment</td>
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<tr>
<td>Electronic equipment</td>
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<tr>
<td>Machinery and equipment</td>
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</tbody>
</table>

Construction is sometimes shown separately throughout this study.
<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Manufacturing</td>
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<td>Electricity</td>
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<td>Gas manufacture, distribution</td>
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<td>Water</td>
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<tr>
<td>Construction</td>
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<tr>
<td>Retail</td>
<td>All retail sales</td>
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<td></td>
<td>Repairs of motor vehicles and personal &amp; household goods</td>
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<td></td>
<td>Retail sale of automotive fuel</td>
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<td>Wholesale</td>
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<td>Wholesale trade and commission trade</td>
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<td>On-Trade</td>
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<td></td>
<td>Hotels and Restaurants</td>
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<td>Transport (Transport/Communication)</td>
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<td>Water transport</td>
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<td>Air transport</td>
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<td></td>
<td>Communications</td>
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<td>Services (Financial/ Public/ Social Services)</td>
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<td>Insurance</td>
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<td>Business services</td>
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<td>Public Administration, Defense, Education, Health</td>
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<td></td>
<td>Dwellings</td>
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<td></td>
<td>Recreational and other services</td>
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About the authors - Steward Redqueen and Ethan B. Kapstein

Company profile
Steward Redqueen is a strategy consultancy firm that aims to magnify the positive impact of the private sector on society. It is represented in Amsterdam, Luxembourg, Barcelona and New York, and executes projects around the world. As specialists since 2000, Steward Redqueen focuses on integrating sustainability, quantifying impact and facilitating change. Clients appreciate our rigorous analysis, our ability to solve complex problems, and being ahead of the curve. We work for (multinational) corporations, (development) financials and public sector organizations. Since 2006 Steward Redqueen has completed more than 50 socio-economic impact studies for multinational mining companies, development finance institutions, multinational food & beverage firms, banks and recreational organisations in Asia, Africa, Latin America and Europe.

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Socio-economic impact assessments (SEIA)
Foreign direct investment (FDI) has been a source of controversy for many decades. Supporters of FDI point to the benefits of adding foreign capital to domestic savings, and to the employment, technology transfer, and (in many cases) exports that are generated. Detractors assert that FDI crowds out domestic firms and suppliers while contributing little to government tax revenues. Our Socio-Economic Impact Assessments go beyond assertions in an effort to quantify the direct and indirect impacts of firms in the countries in which they are active. On these projects we work together with Professor Ethan B. Kapstein of Georgetown University (Washington, DC), who is an associate partner of Steward Redqueen.

Ethan B. Kapstein
Ethan B. Kapstein, an associate partner at Steward Redqueen, is currently Visiting Professor of Global Strategy at Georgetown University in Washington DC. Previously he held positions at INSEAD, Harvard University, the University of Minnesota, and the Organization for Economic Cooperation and Development. A former international banker and naval officer, Prof. Kapstein serves as an economic and strategy consultant to government agencies and many of the world’s leading multinational corporations. His latest books are *Economic Justice in an Unfair World* and *The Fate of Young Democracies*.

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