https://doi.org/10.17221/258/2018-AGRICECON

Bankability of a public private partnership in agricultural sector: A project in Sub Saharan Africa

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Citation: Morea D., Balzarini M. (2019): Bankability of a public private partnership in agricultural sector: A project in Sub Saharan Africa. Agricultural Economics – Czech, 65: 212–222.

Abstract: A public private partnership can be an effective approach to deal the projects with modern agricultural development in Sub Saharan Africa. A former financial analysis of a development project, carried out by the authors, showed that public and private partners can effectively join in a mutually satisfactory venture capital. The same project is now complemented with a bankability study, considering lenders options, equity allocation, collaterals and likely applicable interest rates, available cash flow and sustainable debt service repayment to provide a through financing scenario for each partner's perspective assessing the relevant Debt Service and Loan Life Cover Ratios. Cash flow and interest rates fluctuation impacts are eventually investigated with a sensitivity analysis to prove the robustness of the proposed scenario.

Keywords: financiability analysis; modern agricultural development projects; project financing

Esty et al. (2014) report that total project financed investment grew by a factor of ten times in a decade. During 2014, the amount invested in Project Financing was larger than the amounts raised through Initial Public Offerings (IPOs) or venture capital funds (Pinto and Alves 2016).

The use of Project Financing has a relatively long history for industrial projects (such as mines, pipelines and oil fields), while the public-private partnerships approach was recently extended to infrastructure projects, such as toll roads, power plants, telecommunication systems, schools, hospitals and prisons (Bayar et al. 2016).

Project Financing involves the creation of a legally independent project company (Special Purpose Vehicle) financed with limited-recourse debt and with equity from one or more corporate entities (sponsors) for the purpose of financing an industrial or infrastructure project. The project, its assets, its contracts and its cash flows are segregated from those of the sponsors in order to obtain the credit appraisal and the loan for the project, independent from the sponsors (Gatti 2013).

Public-private partnerships implementing large projects under a Project Financing arrangement exhibit the following important features (Brealey et al. 1996): projects operate under a concession obtained from the host government; the sponsors provide a large portion of the equity for the project company and expertise in developing and running the project; the host government may provide equity and running capital for the project company, facilitation for authorizations, and fiscal agreements; the sponsors and the government may enter into contracts regarding the long-run ownership and operation of the project.

Project Financing creates value and thus reduces funding costs by resolving agency problems, reducing asymmetric information costs and improving risk management (Brealey et al. 1996; Esty 2003; Esty 2004a,b; Corielli et al. 2008), but there are some main problems related to the use of Project Financing, such as complexity in terms of designing the transaction and writing the required documentation, higher costs of borrowing when compared to conventional financing, the negotiation of the financing and operating agreements that is time-consuming (Esty

https://doi.org/10.17221/258/2018-AGRICECON

2004a,b; Gatti 2013). Nevertheless, when compared Project Financing to corporate financing, the additional costs are more than compensated for by the advantages that arise from the reduction in the net financing costs associated with large capital investments, off-balance sheet financing and appropriate risk allocation (Esty 2004b).

Many papers studied investment projects in several fields, also using the Project Financing technique (mainly in the energy sector, including non-conventional financial instruments): see Kjærland (2007), Blanco (2009), Muzathik al. (2012), Monjas-Barroso and Balibrea-Iniesta (2013), Sgroi et al. (2014), Squatrito et al. (2014), Biondi and Moretto (2015), Campisi et al. (2015), Campisi et al. (2016), Morea and Poggi (2016), Campisi et al. (2017), Morea and Poggi (2017), Campisi et al. (2018 a,b), for a review. In the agricultural sector, the use of public-private partnerships under a Project Financing arrangement has been studied by the authors, in a previous paper (Morea and Balzarini 2018), for a development project in Sub-Saharan Africa in term of financial sustainability, but it has not been carried out a bankability analysis of the project.

In this paper, the bankability of a public-private partnership venture applied to a major new irrigated agriculture development project in Sub-Saharan Africa is implemented to assess its viability from the different standpoints of the partnership partners. For the reader's convenience, the study is introduced by the recap of the assumed background of the project and by highlights form the relevant financial analysis (Morea and Balzarini 2018). Then, the bankability analysis of the project is presented and, finally, a sensitivity analysis of cash flows and interest rates, which prove the robustness of the proposed scenario.

BACKGROUND

New irrigation project implementation

It is assumed that a country in Sub-Saharan Africa has the chance to implement a new irrigated agriculture development project on an area of about 35 000 ha. It is also considered that, due to the severe environmental constraints preserving the wildland from any kind of unfair exploitation, land could only be made available by the enlargement of an existing agricultural project, irrespectively to its actual suitability for irrigation: a detailed soil survey mapped out a Zone "A" rated as suitable for both rain-fed and overhead pivot irrigation (S2 and S3 FAO Soil Classification) and any crop extended on about 2/3 of the area, and a Zone "B", the remaining 1/3 of the area, found with low water holding capacity and therefore rated as suitable for drip irrigation system and exotic crops only.

Being an essential support for the financial analysis, a cropping pattern is assumed according many concurrent criteria, such as soil conditions, water availability, crop rotation and diversification, market potential, food crop versus cash crop balance: cereals (maize, wheat), oilseeds, pulses (soybeans) and fodder crop in the dry season and sorghum, sunflower and beans with supplementary irrigation during the rainy season on Zone "A", and mango trees (perennial) on Zone "B". The overall crop intensity is 200% in both zones.

The relevant implementation works consist in head works (reservoir and pumping station), irrigation facilities (distribution pipes, pivot and drip irrigation system), roads, drains and fencing, with preliminary land preparation works (land clearance and levelling) and complemented by immigrant labourers' facilities.

Public-private partnership approach

Under the proposed public-private partnership approach the implementation and the management of the project are proposed as follow.

A Project Authority (PA) is established under the Public Administration. It will own and be in charge of the operation, maintenance and replacement of the main infrastructure of the project, including the head works, the irrigation and drainage infrastructures down to the secondary level, the service roads and any facility outside the farm/plant gate. It will also supply ready-to-crop land and required general services for modern agriculture (pressurized irrigation water, rent of agricultural machines).

The Farmers will run the whole agricultural business within the farm gate, earning from the sale of the crops and paying for the relevant production cost such as manpower hiring, purchasing of services from the PA and of inputs from the market (seeds, fertilizers, pesticides) and eventually irrigation water, land rent and energy. Additionally, Farmers will be responsible for the implementation, operation, maintenance and replacements of any facility within the farm gate, including irrigation systems.

The Processing Industrialists will process the goods coming from the farms (milk, fodder, and fruit) and will implement, own and operate the relevant plants

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and facilities; they will buy inputs from the Farmers and sell the products to the local, national or international market.

The proposed farm size is 700 ha so that the overall 35 000 ha of the project are supposed to be shared among 50 large commercial Farmers, with own capitals and access to financing facilities.

Costs, revenues and financial analysis

The financial model backing the bankability study compares revenues and costs taking into account their distribution along the study horizon of 30 years. In order to allow a separate accountancy into each Partner's budget according to the public-private partnership attribution above, total amounts are split into "off farm/plant" and "on farm/plant", depending on whether the item lays outside or inside the farm/plant gate.

Considering 35 000 ha area irrigation project, 2/3 pivot and 1/3 drip irrigation equipped, an overall investment costs of about 350 million of United States Dollars (M USD) can be assumed (based on market values), where Processing Plants have a minor share of the investment cost (3%), while on farm costs alone, referred to field irrigation and field roads, sum up to 25% of the total investment costs.

The annual maintenance costs, estimated as a percent of the replacement asset value (Gatti 2013), are about 4.5 M USD/year for "on farm" works and Processing Plants, being the remaining 6.6 M USD/year referred to "off farm" works.

The annual operational costs resume the staff costs of the PA and any other general purchase of goods or hired services and are estimated as much as the 1% of the construction cost of the project works plus energy costs for 250 million m^3 water pumping, leading to a total cost of about 8.6 M USD/year, totalling, together with maintenance, 19.0 M USD annual OPEX (operating expenditures).

The seasonal crop production costs are given by the combination of each input requirement and the relevant unitary cost; while the cost of the mechanized or manual works and material inputs (seeds/plants, fertilizers, pest control products) is market-driven, tariffs for pressurized water supply and land rental were set to 0.05 USD/$m^3$and 40 USD/ha/year respectively, together with a 12% duty on processed goods revenues, in order to divert a fair share of the earnings generated by the project towards the PA to pay for the investment and running costs it is in charge of, without reducing the private partners' profits below an appealing convenience threshold. Being these flows internal to the project, the consolidated cash flow at the project level is not affected.

Annual production and operational costs for processing activities are about 85 M USD/year and are, unlike farming, extremely higher if compared to investment costs. For these facilities, annual revenues and working capital provision is the main driver for the assessment.

Annual estimated revenues, as far as the whole project is concerned, are equivalent to the whole and only total revenues from the agricultural production and from processes agricultural goods. Farm Gate Prices for the crops and Plant Gate Prices for the processed goods were figured out through a market analysis and eventually combined with the expected production to give the expected annual revenues: roughly 200 M USD/year in mature condition (95 M USD once net of production costs), half from agricultural production and half from processing.

The combination of revenues and costs of the project as a whole, leads to an estimated Net Present Value (NPV) of 151 M USD, Pay-Back Period (PBP) is 10 years and the financial profitability in terms of Internal Rate of Return (IRR) is 14.7% (> weighted average cost of capital, assumed 10% according to the market). Moving to each Partner's budget, Farmers and Plants Owners share a profit gain close to 200 M USD [NPV (10%)] and show IRR and an operating margin far beyond 15%, while the Project Authority reaches an expected NPV (5%) of 20 M USD.

METHODOLOGY

This study is based on a previous one, showing the satisfactory financial performance of the project in terms of IRR, NPV and PBP, considering both the project as a whole and each partner individually (PA, Farmers, Industrialists) (Morea and Balzarini 2018).

The bankability of the public-private partnership is now investigated to assess the actual opportunity for each Partner to leverage the investment through effective funding options at current financial market condition, balancing equity inflows from the borrowers and disbursements from the lenders in the framework of applicable interest rates, refund periods, amounts for the installments and possible grace periods.

Once the financing options are set, the relevant ability to repay for the debt service is assessed on year-by-year and loan-life-long perspective determining

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the Debt Service Cover Ratio (DSCR) and Loan Life Cover Ratio (LLCR), respectively (Gatti 2013).

Bankability study

In this paragraph, the financing options and opportunities of the project are assessed. The financial institutions which may be interested in funding the project are described first, than the structure of possible financing options is proposed, referred to the likely bank rating specific for each one of the two main entities participating to the project. Eventually, the Coverage Ratios to which the financing institution will commonly subordinate the loan and the equity that is expected to be paid in by the borrower will be also considered in the proposal.

Lenders

The African Development Bank (AfDB) is the main institution for the funding of development projects in Africa. Loans are accommodated to projects matching its statutory target "to spur sustainable economic development and social progress in its regional member countries", applying different interest rates according to the kind of guarantee (sovereign/non-sovereign) and to each project risk.

Commercial Banks usually have credit facilities for commercial Farmers based on standard risk profiling of the potential borrower. Moreover, each country generally has Development Financial Institutions, statutory providing a varied range of financial services to business ventures in the agricultural sector or even long-term soft loans under special condition. In all cases and given the size of the Project, structuring a dedicated financing facility based on the collateral sovereign guarantee from the National Budget, either directly or through the Special Purpose Vehicle of the Project Authority itself would ease the management of risk and therefore the cost and amount of credits to Farmers from private or development financial institutions.

Borrowers

When focusing on the participating partners, it has to be considered that each one of them has its own operating tasks, kind of business to run and return expectations on the one hand, and risk profile and access to capitals on the other.

Cash needs and ability to repay for debt service are referred to each Partner's own cash flow, while interest rates are applied according to the current financial market conditions and to conservative assumptions for its future trend.

Bankability is assumed viable when DSCR and LLCR are above 2.5 for the Farmers and, being a state owned company, above 1.5 for the PA; at the same time, a grace period of 5 and 4 years respectively is assumed, considering the fact that in the implementation period the available cash flow is below zero and debt service could not be repaid.

A corporate tax of 12% on profit, 30 years amortization of investment for PA and 20 years for Farmers are assumed to estimate the relevant available cash flows.

Project Authority investment bankability

PA inflows, outflows and eventually cash flow before financing are shown in Table 1, as resulting from the financial analysis (Morea and Balzarini 2018).

According to the estimated cash flow, financing is needed to cover an overall deficit of about 200 M USD in the first 4 years. It can also be noticed that the annual instalment cannot exceed 19.4 M USD (a little less in the first few years), corresponding to the steady nominal value of the annual income to the PA from fees, rents and duties, net of the concurring operational

Table 1. Project Authority cash flow before financing (nominal values in M USD/year)

	Year									
	1	2	3	4	5	6	7	8	9	10
Revenues	6.4	19.3	29.2	32.9	33.0	33.3	33.5	33.7	33.7	33.7
OPEX	–3.4	–8.6	–12.8	–14.3	–14.3	–14.3	–14.3	–14.3	–14.3	–14.3
CAPEX	–50.1	–100.1	–75.1	–25.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow	–47.1	–89.4	–58.7	–6.4	18.7	19.0	19.3	19.4	19.4	19.4

M USD – million USD; OPEX – operating expenditures; CAPEX – capital expenditures

Source: author's elaboration

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Table 2. Project Authority financing option

	Interest (%)	Periods (years)	Principal (M USD)	Instalments (M USD/year)	Start (year)	Grace period (year)
Loan 1	3.0	13	90.0	–8.5	1	4
Loan 2	3.0	13	40.0	–3.8	3	4
Total	–	13	130.0	–12.2	1	4

M USD – million USD

Source: author's elaboration

and maintenance expenditures once implementation period is over.

The proposed financing option is structured in a two-step-disbursement Variable Spread Sovereign Guaranteed Loans (VSGL) provided by AfDB. The loan is therefore approached as the combination of two subsequent ones starting in year 1 and year 3 and with a principal of 90 M USD and 40 M USD respectively, lasting 15 years after an initial grace period of 4 years, complemented by 80 M USD equity (close to 40% of the whole capital) to be paid in through three equal instalments between year 1 and year 3 by the PA.

The Applicable Lending Rate (ALR) used in the elaboration is 3% (Table 2), considering that VSGL issued by AfDB between 2005 and 2018 enjoyed relatively low but rising lending rates, as a result of a Lending Spread (LS) between 40 and 80 basis points (rather than "specific to each project" as for non sovereign guaranteed loans) and a Funding Margin (FM, Banks' average cost of funding) close to zero on top of the current Floating Base Rate (FBR), constantly below 200 basis points for USD loans (African Development Bank Group 2018). Accordingly, 12.2 M USD instalments have to be paid from year 5 to year 17.

The Unlevered Free Cash Flow (UFCF), needed to compare the cash flow yearly available to repay for debt service versus debt service itself and provide the relevant cover ratio, is found deducting taxes from EBITDA [Earnings Before Interest, Taxes, Depreciation and Amortization = revenues net of operational expenditures (Table 1)] as shown in Table 3. The same amounts, discounted at 6% discount rate for PA, cumulated forward and compared, provide LLCR. It can be seen that DSCR and LLCR are constantly equal or above 1.5, and, additionally, profits after the implementation period rise from less than 6 M USD/year to almost 10 M USD/year once loans repayment period expires.

An option with no equity from the PA can be also considered, where capital and debt service are fully covered by external sources, inflowing 150 and 60 M USD at year 1 and 3. Considering the same 3% interest rate above, similar cover ratios can be obtained extending the repayment period from 13 to 25 years, corresponding to 12.1 M USD annual instalment. The overall nominal cost of interest rises accordingly from less than 30 M USD to more than 90 M USD.

Farmers' investment bankability

Farmers' cash flow coming from the financial analysis is shown below. The figures in this paragraph deal with Farmers intended as a whole entity; nevertheless figures referred to each one of the 50 individual Farmers can be easily derived (Table 4).

According to the estimated figures in Table 4, financing is needed to cover an overall deficit of about 140 M USD in the first 5 years (2.8 M USD for each Farmer). It can also be noticed that annual instalment in the long run shall not exceed 38 M USD (0.76 M USD for each Farmer), corresponding to the steady nominal value of the annual benefits remaining to the Farmers once implementation period is over (year 8), and that no DSCR, can be considered in the first 5 years, being benefits below-zero.

The proposed financing option is again structured in a two-step-disbursement over a twelve years repayment period at variable interest rates, assuming the loan is provided to each single Farmer by a Commercial Banks or a National Development Financial Institution in the framework of a financing facility relying on collaterals from the Project Authority or the State Treasury.

The loan is therefore approached as the combination of two subsequent ones starting in year 1 and year 3, with principals of 60 and 30 M USD respectively and both lasting up to year 17 after a 5 years of grace period, complemented by 60 M USD equity (40% of the whole capital, close to 1.2 M USD for Farmer) to be paid in through four equal instalments between year 1 and year 4.

https://doi.org/10.17221/258/2018-AGRICECON

Table 3. Project Authority cash flow including debt service (nominal values in M USD/year)

	Year																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Loan	90.0	0.0	40.0	0.0	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	–12.2	0.0	0.0	0.0
Equity	26.7	26.7	26.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EBITDA	2.9	10.7	16.4	18.6	18.7	19.0	19.3	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Amortisation	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3	–8.3
Net Operating Margin	–5.4	2.4	8.0	10.3	10.4	10.7	10.9	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
Interest payable	0.0	0.0	0.0	0.0	–3.9	–3.7	–3.4	–3.1	–2.9	–2.6	–2.3	–2.0	–1.7	–1.4	–1.0	–0.7	–0.4	0.0	0.0	0.0
EBT	–5.4	2.4	8.0	10.3	6.5	7.0	7.5	8.0	8.2	8.5	8.8	9.1	9.4	9.7	10.0	10.4	10.7	11.1	11.1	11.1
Corporate Income Tax	0.0	–0.3	–1.0	–1.2	–0.8	–0.8	–0.9	–1.0	–1.0	–1.0	–1.1	–1.1	–1.1	–1.2	–1.2	–1.2	–1.3	–1.3	–1.3	–1.3
Profit/loss	–5.4	2.1	7.1	9.1	5.7	6.2	6.6	7.0	7.2	7.5	7.7	8.0	8.3	8.5	8.8	9.1	9.4	9.7	9.7	9.7
Unlevered Free Cash Flow	2.9	10.4	15.4	17.4	18.0	18.2	18.4	18.5	18.4	18.4	18.4	18.3	18.3	18.3	18.2	18.2	18.1	18.1	18.1	18.1
Debt Service Cover Ratio	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	–	–	–
Loan Life Cover Ratio	0.0	0.0	0.0	0.0	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.9	2.2	2.9	–	–	–

M USD – million USD; EBITDA – earnings before interest, taxes, depreciation and amortization = revenues net of operational expenditures; EBT – earnings before tax

Source: author's elaboration

https://doi.org/10.17221/258/2018-AGRICECON

Table 4. Farmers' cash flow before financing (nominal values in M USD/year)

	Year									
	1	2	3	4	5	6	7	8	9	10
Revenues	–5.6	–12.7	–13.0	–7.4	3.1	19.5	33.4	42.9	42.9	42.9
OPEX	–0.9	–2.8	–4.3	–4.7	–4.7	–4.7	–4.7	–4.7	–4.7	–4.7
CAPEX	–17.3	–34.6	–26.0	–8.7	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow	–23.8	–50.1	–43.2	–20.7	–1.7	14.7	28.7	38.2	38.2	38.2

M USD – million USD; OPEX – operating expenditures; CAPEX – capital expenditures

Source: author's elaboration

The Applicable Lending Rate is assumed to be 6% (Table 5), double than the one applied to the PA, considering on one hand a premium on the insolvency risk from Farmers covered by the PA supplying sovereign guarantee, and on the other hand the equity disbursed by the Farmers during the grace period to enter into the business. Accordingly, 10.7 M USD instalments have to be paid from year 4 to year 17.

Similarly to PA, Farmers' UFCF, debt service, EBITDA, and the same cumulated-forward amounts discounted at 10% discount rate for Farmers, and relevant cover ratios are shown in Table 6. It can be seen that DSCR and LLCR are constantly equal or above 2.5 (with the only exception of DSCR in the first year after the grace period) and, additionally, profits after the implementation period sharply rise from about 4 M USD/year to almost 30 M USD/year once loans repayment period expires.

Processing Plant

Processing Plant financial analysis showed that the investment is relatively low if compared with those of Farmers and of the Project Authority, though having similar profits. Actually the cash flow is positive since the very first year and the business doesn't need long term financing. Nevertheless, if revenues and production costs are compared, it is apparent that a huge amount of money is needed yearly to buy the inputs to be processed and that therefore the main financial issue for the Processing Industrialists is the supply of working capital. This issue goes beyond the limit of this paper, but it is worth mentioning that about half of the mentioned working capital is spent within the Project boundaries to buy crops and fruit to be processed, allowing for a reciprocally profitable collaboration among buyers and sellers participating to the same vertically integrated business and dramatically reducing the need of external financing.

SENSITIVITY ANALYSIS AND CONCLUSION

The effect of changes in the most impacting drivers of the bankability on the average and minimum value of the Cover Ratios of both Project Authority and Farmers' loans were eventually investigated through a sensitivity analysis.

The impact of a progressive increase of interest rates up to 100 basis points (Bips) per year, and of a reduction of revenues up to –20%, is shown in Figures 1–4. As far as meaningful, the effect of a reduction of interest rates and of an increase in revenues is also represented.

It can be seen that, as far as interest rates rise slower than 100 Bips per year, both DSCR and LLCR remain

Table 5. Farmers' financing option

	Interest (%)	Periods (years)	Principal (M USD)	Instalments (M USD/year)	Start (year)	Grace period (year)
Loan 1	6.0	12	60.0	–7.2	1	5
Loan 2	6.0	12	30.0	–3.6	3	5
Total	–	12	90.0	–10.7	1	5

M USD – million USD

Source: author's elaboration

https://doi.org/10.17221/258/2018-AGRICECON

Table 6. Farmers' cash flow including debt service (nominal values in M USD/year)

	Year																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Loan	60.0	0.0	30.0	0.0	0.0	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	–10.7	0.0	0.0	0.0
Equity	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EBITDA	–6.5	–15.5	–17.3	–12.1	–1.7	14.7	28.7	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2
Amortisation	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3	–4.3
Net Operating Margin	–10.8	–19.8	–21.6	–16.4	–6.0	10.4	24.4	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8
Interest payable	0.0	0.0	0.0	0.0	0.0	–5.4	–5.1	–4.7	–4.4	–4.0	–3.6	–3.2	–2.7	–2.2	–1.7	–1.2	–0.6	0.0	0.0	0.0
EBT	–10.8	–19.8	–21.6	–16.4	–6.0	5.0	19.3	29.1	29.5	29.8	30.2	30.7	31.1	31.6	32.1	32.7	33.2	33.8	33.8	33.8
Corporate Income Tax	0.0	0.0	0.0	0.0	0.0	–0.6	–2.3	–3.5	–3.5	–3.6	–3.6	–3.7	–3.7	–3.8	–3.9	–3.9	–4.0	–4.1	–4.1	–4.1
Profit/loss	–10.8	–19.8	–21.6	–16.4	–6.0	4.4	17.0	25.6	25.9	26.3	26.6	27.0	27.4	27.8	28.3	28.7	29.2	29.8	29.8	29.8
Unlevered Free Cash Flow	–6.5	–15.5	–17.3	–12.1	–1.7	14.1	26.4	34.7	34.6	34.6	34.5	34.5	34.4	34.4	34.3	34.2	34.2	34.1	34.1	34.1
Debt Service Cover Ratio	0.0	0.0	0.0	0.0	0.0	1.3	2.5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	–	–	–
Loan Life Cover Ratio	0.0	0.0	0.0	0.0	0.0	3.0	3.3	3.4	3.4	3.5	3.5	3.6	3.7	3.8	4.1	4.6	6.1	–	–	–

M USD – million USD; EBITDA – earnings before interest, taxes, depreciation and amortization = revenues net of operational expenditures; EBT – earnings before tax

Source: author's elaboration

https://doi.org/10.17221/258/2018-AGRICECON

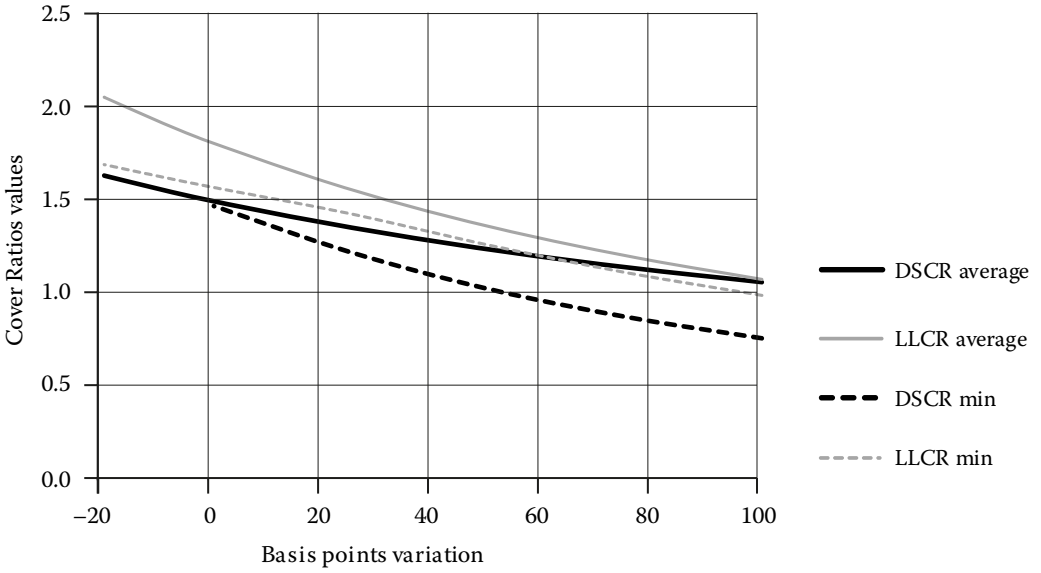

Figure 1. Cover Ratios sensitivity to interest rate – Project Authority

DSCR – Debt Service Cover Ratio; LLCR – Loan Life Cover Ratio

Source: author's elaboration

above 1 (with the exception of the minimum DSCR for the Project Authority beyond 50 Bips per year). Similarly, reduction of inflows up to 20% keep on having the Cover Ratios strictly above 1. For both interest rates and revenues, Farmers show better reaction to variation than the Project Authority, and LLCR than DSCR.

In conclusion, it is possible to claim that 220 M USD from dedicated loans from African Development Bank to the Project Authority and soft loans from national Development Banks and Commercial Banks for commercial Farmers, supported by 140 M USD equity from the borrowers and sovereign guarantee,

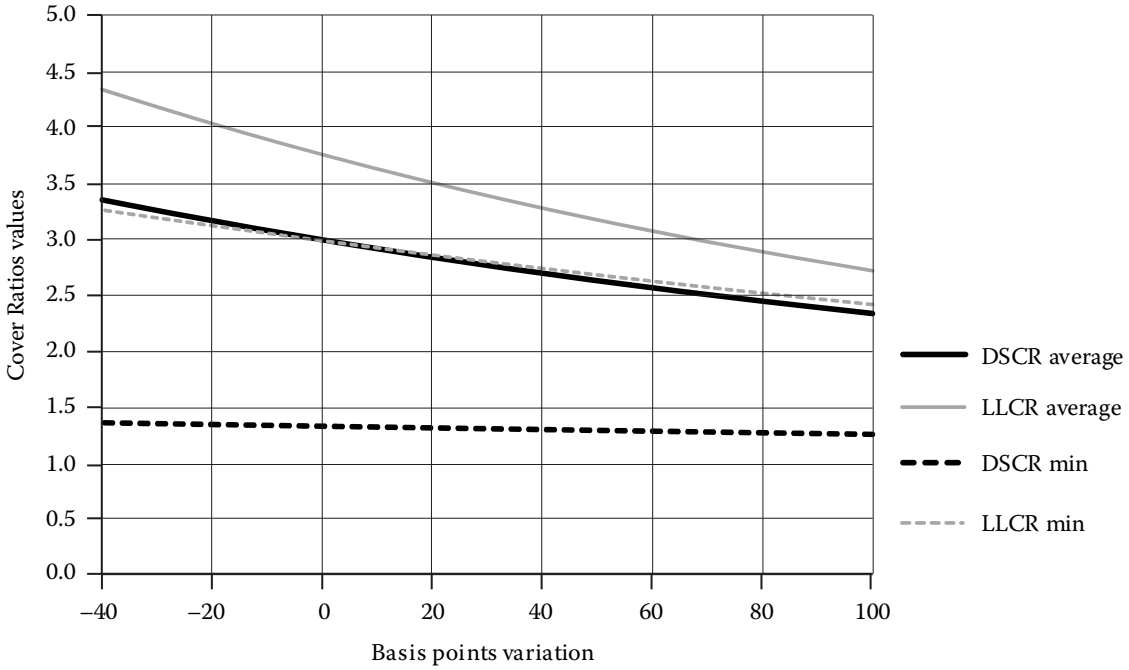

Figure 2. Cover Ratios sensitivity to interest rate – Farmers

DSCR – Debt Service Cover Ratio; LLCR – Loan Life Cover Ratio

Source: author's elaboration

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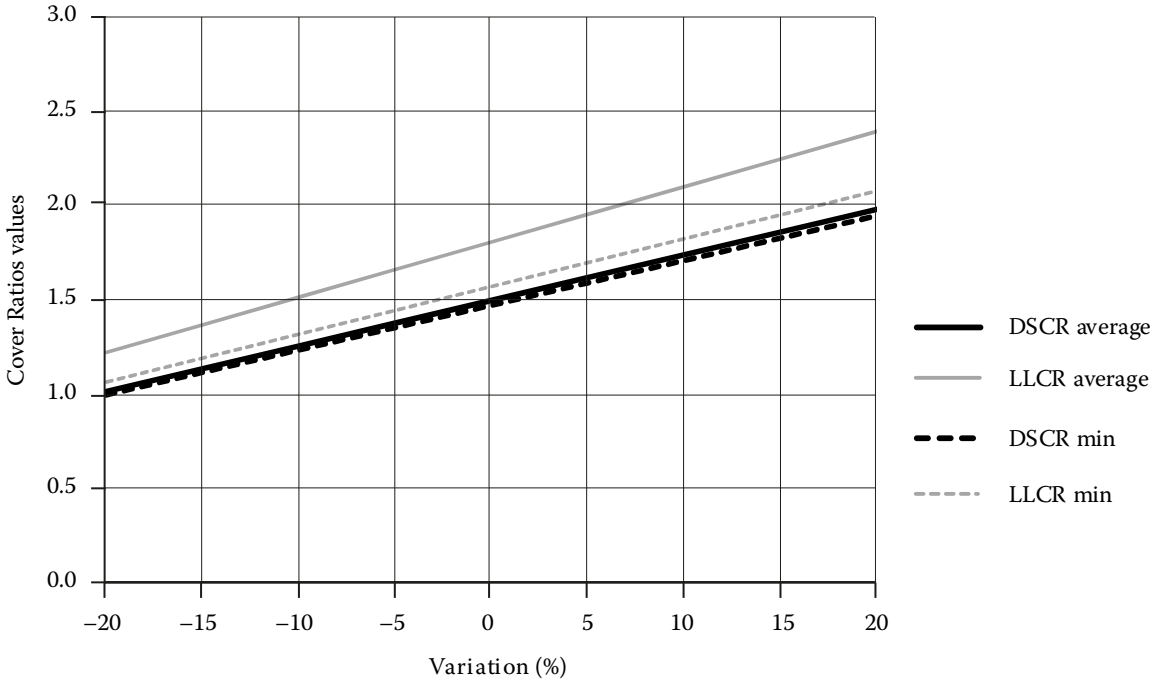

Figure 3. Cover Ratios sensitivity to revenues – Project Authority

DSCR – Debt Service Cover Ratio; LLCR – Loan Life Cover Ratio

Source: author's elaboration

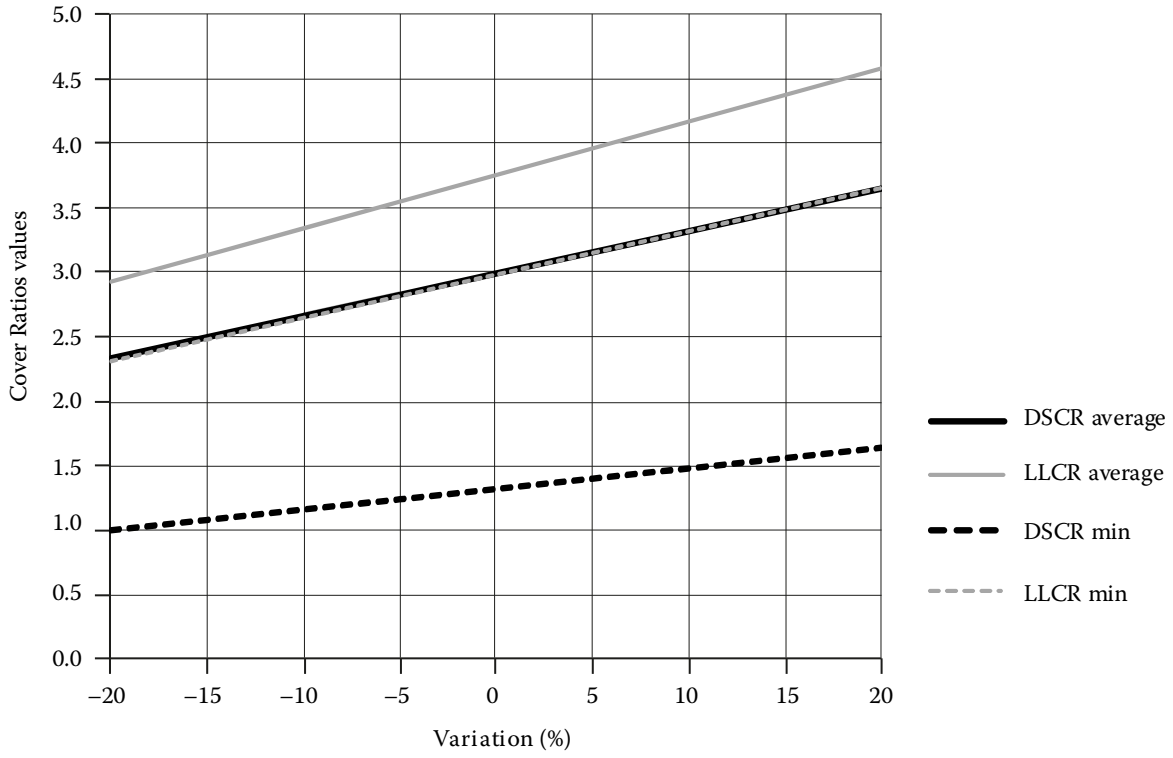

Figure 4. Cover Ratios sensitivity to revenues – Farmers

DSCR – Debt Service Cover Ratio; LLCR – Loan Life Cover Ratio

Source: author's elaboration

https://doi.org/10.17221/258/2018-AGRICECON

can effectively leverage the capital investment for the implementation of a new large Irrigation Project considering the individual credit profiles of each public-private partnership partners.

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Received August 14, 2018
Accepted September 19, 2018