Moving Beyond Mines and Mobiles: How Can IFC Add Value in Fragile States?

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Abstract

The International Finance Corporation wants to increase its development impact in fragile states. Currently, the IFC's fragile-state portfolio mirrors that of overall foreign direct investment stocks in such countries: focused in extractive industries and mobile telephony. That suggests potentially limited value-added from the Corporation's investments in terms of crowding in private capital. If the IFC is trying to increase its portfolio and development impact in fragile states, it should look for sectoral opportunities that share some of the features of mines and mobile investments but currently attract limited FDI—where corporation investment could act as a catalyst to private investments. These features include limited reliance on broader infrastructure, regulatory institutions or local skilled labor, comparatively simple financing, and the generation of large enough rents to provide revenues to government while remaining profitable. Off-grid electricity is a sector that is evolving towards such features and the IFC should consider a stronger push towards off-grid projects in fragile states.

CGD is grateful to its board of directors and funders, including the UK Department for International Development, the Royal Danish Embassy, the Australian Agency for International Development, and the Swedish Ministry of Foreign Affairs for support of this work.

Charles Kenny. 2013. "Moving Beyond Mines and Mobiles: How Can IFC Add Value in Fragile States?." CGD Policy Paper 030. Washington DC: Center for Global Development.
http://www.cgdev.org/publication/moving-beyond-mines-and-mobiles-how-can-ifc-add-value-fragile-states

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Center for Global Development

CGD Policy Paper 030
August 2013

Contents

Many thanks to Jonathan Karver and Sarah Dykstra for research support and Alan Gelb, Ben Leo, and Ross Thuott for comments.

1. Introduction

The International Finance Corporation (IFC) is the private sector lending arm of the World Bank Group. Since 2004 the Corporation has highlighted five 'strategic focus areas,' designed to be the framework within which IFC delivers development impact. The first of these areas is "Strengthening the focus on frontier markets (IDA countries, Fragile Situations, and frontier regions in non-IDA countries)." In its FY2013-15 roadmap, the IFC reports it committed $515 million in 43 investment projects in countries and territories on the World Bank Group Fragile Situations List in FY2011. That amounts to just 4% of total IFC commitments, down from 6% in FY08.

Low IFC investment in fragile states is particularly notable in Africa, where Ramachandran, Leo, & Thuotte (2011) report that IFC's project commitments to African fragile states on a per capita basis are one quarter those to middle-income countries. These investments are also highly sectorally concentrated. Between 2000 and 2010, the IFC invested around $697m in projects in African fragile states, of which $400m was the Chad-Cameroon pipeline, and $170m were two telecoms projects in DRC and Chad, leaving $127 million spread between all other investments.[1]

This paper takes a brief look at the current value added of IFC investments in fragile states. It suggests that the focus on oil/gas/mining and mobiles matches the overall sectoral distribution of FDI in fragile states, and that it does not appear that IFC mobile investments in fragile states in particular are correlated with more rapid development in the telecoms sector in those states. The paper explores why FDI might be concentrated in mines and mobiles, and what that suggests about sectoral opportunities that share some of the features of the mining and mobile industries but currently attract limited FDI –where corporation investment could act as a catalyst to private investments. It suggests off-grid electricity may be one such sector. The IFC could both increase its investment levels in fragile states and increase its development impact by moving into 'frontier sectors in fragile markets' such as off-grid solar.

2. Value Added?

Most FDI to fragile states goes to extractive industries. Peschka (2011) reports that over 70 percent of $21 billion-worth of FDI to 42 fragile states in 2006 went just to six countries, five of which were natural resource-rich. Outside of oil fields and mines, mobile telecommunications may be the largest sector for FDI in many resource-poor fragile states. Rollout of private mobile telecommunications has occurred in some of the most challenging markets in the world. Between 2001-6, Afghanistan moved from one to six mobile

[1] It should be noted that between 1980-2002, IFC invested $2.8 billion in fragile states in Africa according to Ramachandran, Leo and Thuotte. Of that total, 59% was in mining, 27% in 'general PSD', 7% in finance and 4% in telecom. MIGA guaranteed $797m in investments in African fragile states of which 42% were 'general PSD,' 27% were telecom and 22% were finance.

operators, who invested around $500m in infrastructure, added around 1.6 million subscribers, and covered about 60 percent of the population with a mobile signal.[2] More broadly, Table One suggests that more than $6 billion in private investment flowed to mobile telecommunications rollout in seventeen economies described by the World Bank as 'low income countries under stress' between 2000-2011.

Table One: 2011 Statistics on Mobile Telecoms in Selected Low Income Countries Under Stress

	GDP per capita (current US$)	Mobile cellular subscriptions (per 100 people)	Private investment in mobile telecoms 2000-2011 ($m)
Afghanistan	576	54	1,582
Burundi	271	14	79
Cambodia	900	70	750
Central African Republic	483	25	55
Comoros	809	29	-
Congo, Dem. Rep.	231	23	1,970
Eritrea	482	4	40
Guinea	502	44	440
Guinea-Bissau	629	26	127
Haiti	726	41	324
Lao PDR	1,320	87	223
Liberia	281	49	174
Myanmar	..	3	-
Solomon Islands	1.517	50	-
Somalia	..	7	13
Togo	584	50	91
Zimbabwe	776	72	877

Source: World Bank World Development Indicators

The sectoral concentration of total FDI in fragile states in the same sectors as IFC investments appear to be concentrated does raise the concern that the projects the IFC supported were likely to attract investment with or without the IFC. One way to examine if the IFC's investments are speeding the development of mobile telecommunications in particular in countries including fragile states is to see if (i) the Corporation is investing in telecoms sectors that appear underdeveloped given general income levels and/or (ii) after the IFC's investment, the telecoms sector is more developed than might be expected given general income levels. Table Two provides data descriptions and Table Three provides regression outputs based on such an analysis.

[2] Best & Kenny, 2009

The regression takes the following form:

$$(\text{telecoms subscribers/capita})_t = C + A * (\log \text{GNI per capita})_t + B * (\text{IFC investment in telecoms 2003-2007})$$

The IFC investment variable is a dummy for an IFC telecoms investment any time between 2003 and 2007. The regression is run using subscriber and GNI/capita data for 2000 and 2009. The 2000 regression is to test if IFC investments occur in countries previously lagging on telecommunications rollout. The 2009 regression is to test if, subsequent to an IFC investment, countries emerge as leaders in telecommunications rollout. The regression is run across a sample of all countries and then a subset of fragile states. The short answer is that the analysis cannot provide support for a story that suggests either (i) the IFC invests in countries that have particularly low telecoms rollout or (ii) that IFC investments are associated with particularly strong sector performance in subsequent years. Indeed, the coefficient on the IFC dummy in the 2000 fragile state regression is positive, suggesting the corporation is investing in fragile states that already see comparatively good sector performance compared to their peers. For example, the IFC only invested in Afghanistan's third private mobile company in 2006, after considerable private investment and sector growth.

Table 2: Summary Statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
IFC Telecoms 2003-2007	190	0.09	0.29	0	1
GNI per capita (2000)	184	6,783	10,800	90	79,660
GNI per capita (2009)	181	11,697	18,352	150	137,070
Mobile + fixed subscriptions per 100 (2000)	187	35	41	0.05	146.35
Mobile + fixed subscriptions per 100 (2009)	187	102	57	3.7	240
CPIA Fragile State (2000)	190	0.25	0.43	0	1
CPIA Fragile State (2009)	190	0.09	0.29	0	1

Source: World Bank (2011) and IEG (2011)

Table 3: IFC Investments and Telecommunications

	(1)	(2)	(3)	(4)
VARIABLES	Full Sample	Fragile States	Full Sample	Fragile States
Log GNI per capita 2000	22.27***	8.52***		
	(1.109)	(1.705)		
Log GNI per capita 2009			31.29***	7.32
			(1.402)	(4.813)
IFC Telecoms 2003-2007	0.45	3.94*	6.80	1.70
	(4.300)	(2.044)	(6.034)	(6.989)
Constant	-134.80***	-46.96***	-159.52***	-17.31
	(7.989)	(10.383)	(11.698)	(29.852)
Observations	182	45	180	17
R-squared	0.77	0.54	0.69	0.11
Adj. R-squared	0.76	0.52	0.69	-0.02

Robust standard errors in parentheses
*** p<0.001, ** p<0.05, * p<0.10

Four simple cross country regressions should not be taken as conclusive evidence that the overall impact of the IFC's telecommunications investments on sector development is marginal or absent. Not the least this is because the period covered is comparatively late in the mobile telecoms revolution. It may be that early IFC investments really did have a catalytic effect in sector development in host countries as well as an important demonstration effect more widely in showing that private competitive mobile provision could work even in poor and fragile states.

Regardless, the fact is that considerable FDI has flowed to mobile telecoms in poor and fragile economies absent an IFC involvement, and that raises questions about the continued value-added of the IFC in the sector. The same argument might apply to extractive industries, although with the caveat that IFC environmental and social safeguards provide an additional reason for believing additionality in such investments, and considerable private sector demand for IFC involvement in particular extractives deals suggests that IFC involvement may increase overall investment at the margin.[3] But it does appear plausible that the IFC has a comparatively marginal development impact with its current portfolio in fragile states.

One way to increase that impact would be to foster investment in fragile state sectors currently seeing little FDI. If the IFC were able to catalyze such investment and demonstrate their sustainability, this might (most optimistically) lead to a repeat of the mobile revolution in terms of private investment flowing to fragile states and delivering valuable jobs and services. At the same time, it is too much to expect of the Corporation to create private

[3] Alan Gelb, in comments on this paper, suggested the Chad-Cameroon pipeline may be one such case.

investment opportunities where there are none. This suggests looking for a sector akin to the mobile phone sector in the early 1990s –where there are new opportunities for profitable and sustainable investment in fragile states but foreign investment remains sparse. And in order to pinpoint such a sector it is important first to understand what it is about the mobile and mining sectors that make them attractive FDI targets even in fragile states.

3. Why Mines and Mobiles?

Ramachandran, Leo, & Thuotte (2011) report on the basis of business environment surveys that the five most frequently cited constraints to business in African fragile states are electricity (part of a broader problem of weak infrastructure), access to finance, political instability, corruption and tax rates. Why is it that mobile telecoms and mines are apparently less affected by these constraints than other sources of FDI?

In the case of the electricity needed for operation, rigs and mines are big enough consumers of power to generate their own supplies efficiently at scale. Regarding mobile providers, power demands for cell towers are low enough that they are frequently met by generators. Overall, the infrastructure of mobile provision is comparatively self-contained. Prepaid mobile service provision negates the need for a postal or banking network to provide billing services.[4] Mobile telephony as a sector also has a limited reliance on *institutional* infrastructure. While improved competitive outcomes require regulation on spectrum interference and interconnection, for example, this is not generally required to allow some level of competition to flourish –as demonstrated by cases like Somalia and Afghanistan.[5]

Regarding access to finance, extractives tend to involve involve large, geographically diversified multinationals with access to international capital markets. With mobiles, in many fragile states the market is dominated by a few multi-country providers (pan-African operators account for 80 percent of the revenue in African mobile markets, for example).[6] And while there are expenses involved with creating a mobile phone network they are small and more scaleable compared to other infrastructures, allowing for self-financed rollout. The cost of early rollout in (subscriber-dense) cities is particularly low on a per-subscriber basis. To suggest approximate orders of magnitude, at the start of 2010, MTN expected to add 19m new subscribers to its networks outside of South Africa over the course of the year

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[4] Prepaid has the added advantage of shifting credit risk for the consumer and reducing up-front costs per subscriber for phone companies who do not have to subsidize handsets

[5] For example, while Afghanistan was seeing very rapid and competitive growth in mobile provision, the regulator lacked any spectrum monitoring equipment. Providers 'self policed' to the extent necessary. Again, interconnection between operators occurred well before there was a regulator at all. The only company that regularly failed to make interconnect payments in the first few years of the post-Taliban period was the government-owned fixed operator. Adding to the simplicity, this is a rare case where global technocratic standards are reasonably straightforward and work everywhere. Spectrum allocation and interconnection standards in particular are areas where there is considerable international best practice found to apply as much in Liberia as it does in India or Germany Blackman & Srivastava (eds.), 2011.

[6] Zibi, 2009.

(while adding new services such as 3G). Estimated capital expenditures (including upgrades) were expected to equal only around $125 per subscriber. The low marginal costs of additional subscribers means that margins on earnings before interest, taxes, depreciation and amortization (EBITDA) can stay as high as 40 percent even on average monthly revenues per subscriber of $8 or less.[7]

Meanwhile, mobile telephony in most fragile states is competitive but the industry remains highly concentrated.[8] This environment of limited competition between operators has ensured falling consumer prices, but still allows prices to be set significantly above marginal cost. Based on data from a number of Sub-Saharan African countries, Iimi (2007) found that on-network peak prepaid calling costs per minute averaged around 28 US cents, high enough to suggest a price-cost margin of between 2.6 and 7.9. This in turn suggested payback periods to investment of four years.

Low per-user costs alongside high profitability mean that it is possible to use internal revenues to finance investment even where the network is very young.[9] MTN's 2010 capital expenditures of around $125 per subscriber outside of South Africa were similar to the average yearly revenue per user on MTN's non-South Africa network. MTN Nigeria added 7 million subscribers to a network of 23 million in 2009, yet total capital expenditure amounted to only around half of EBIDTA (and less than one third of revenues).[10]

Finally, political instability and corruption are surely a concern to investors, however the license revenue opportunities for governments from both extractives and mobiles are large enough to provide some level of security to owners. Because they operate with imperfect competition they are profitable enough to sustain significant rent extraction (perhaps including bribes) while still making a profit. Indeed, standard financial arrangements with host governments in all states in both sectors involve additional payments –for mining and drilling rights and spectrum.[11]

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[7] Roger, 2009

8 Gruber & Koutroumpis (2010) calculate an average HHI of 0.537 for mobile markets across a range of countries. The US Department of Justice considers an HHI of over 0.18 to be highly concentrated for the purposes of antitrust investigations.

9 The desirability of the mobile phone as a consumer product is suggested by a panel survey of 2,100 households in 135 communities of the Philippines collected in 2003 and 2006 which found that mobile phone ownership lead to a 20 percent decline in monthly tobacco consumption –apparently the mobile is almost as addictive as a cigarette. Labonne & Chase, 2008

10 License payments can be an additional and considerable up-front cost, but again they are soon dwarfed by revenues. MTN paid USD435m for a pair of GSM licenses in Nigeria, for example –but revenues in that country in 2009 were over USD4bn.

11 Again, mobiles are useful to poor smallholders, large poppy producers, terrorists, government officials and industrial workers alike. There is little incentive for a powerful interest group to interfere with this success. (In Afghanistan, the Taliban briefly ordered mobile phone companies to turn off service in Helmand Province in 2011 --they complied-- but the order was rescinded after two weeks) Associated Press, 2011. There has been no widespread tradition of government operation, while finance ministries in particular have embraced

In short, advances in mobile technology created a new sector for investment that shared many of the features of the traditional destination for foreign investment in fragile states – extractive industries. Both sectors see limited demand for government-provided infrastructure, little need for strong central institutions, nor external (to the firm) finance requirements.

4. Improving IFC's Catalytic Role

What do these features of mining and mobile sectors mean for the replicability of the model to other sectors? On the negative side, they suggest it might be limited. Mobile telephony and oil, gas and mining are industries where in-country presence is required and yet due to technological advance the broader regulatory and institutional environment has turned out to be a relatively limited constraint to successful operation. Contrast other sectors that are major destinations for FDI in non-fragile states. Manufacturing and agriculture (especially in globally competitive industries) require high quality physical and financial infrastructure as well as favorable taxation and regulatory efficiency to ensure goods can be priced competitively. Investing firms can easily concentrate their investments in (non-fragile) countries that provide such features. Again, investments in the financial sector are reliant on the broader strength of that sector itself and the regulatory environment that sustains it. Non-telecom infrastructure sectors–traditional networked water and sanitation, power and roads—all have long payback periods and face considerable regulatory challenges related to monopoly provision and the political sensitivity of pricing.

At the same time, technology advance and innovation may be opening up new opportunities for foreign investment in stand-alone infrastructure provision, particularly in energy. The last few years have seen a dramatic decline in the costs of off-grid solar power provision, for example. PV module prices have been falling at a rate of 15 to 24 percent a year for some time. And for the first time in 2011, factory gate prices for crystalline-silicon PV modules fell below $1 per watt mark, often regarded as the point of 'grid parity' for PV. Early in 2012 they reached 85 cents. The 'levelized cost of electricity,' a measure of the average price of power over the lifetime of the power project, has fallen from 32 cents per kilowatt hour in 2009 to 17 cents in early 2012. Off-grid solar is already the most efficient way to provide electricity to large parts of rural Africa.[12]

And local off-grid electricity provision is both considerably more efficient than current energy use and is likely to be monopolistic, suggesting the ability to charge considerably above marginal cost and generate large profit margins (including rents) needed to attract FDI

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competition because of the license payments they can garner. Cross country studies suggest that cellular competition was opened earlier and more completely in countries facing high institutional risk and fiscal constraints There has been no widespread tradition of government operation, while finance ministries in particular have embraced competition because of the license payments they can garner. Cross country studies suggest that cellular competition was opened earlier and more completely in countries facing high institutional risk and fiscal constraints Virto & Gasmi, 2010.

12 Szabó, Bódis, Huld, & Moner-Girona, 2011

to fragile states. It is a repeated finding that those without access to network energy pay considerably more for services than the long run incremental cost of network provision –let alone the (usually lower) price charged to those with network access, suggesting a high demand for services even when supplied at above-cost.[13] In turn, this suggests that foreign investors might be able to replicate their profitable experience with mobile telecommunications by investing in off-grid electricity provision in conducive regulatory environments in fragile states.

An important difference between off-grid/micro-grid energy and mobile telecoms in particular is one of scale: mobile networks tend to expand towards nationwide coverage and launch with (at the least) good coverage in the major city. Off-grid networks are by their nature smaller-scale and more likely to be rural. That suggests that the players in off-grid electricity might naturally be smaller enterprises supporting smaller consumers rather than multinational firms serving large consumers, which in turn raises the question of both financing models and the political clout of providers to withstand excessive government interference or rent-seeking. At the same time, there do remain economies of scale regarding service and maintenance, along with payments.

Furthermore, some emerging models involve economies of scope and 'piggybacking' off existing large firms –not least, mobile companies. With needs for distributed power to provide energy to cell towers, an interest in extending energy access to allow easy phone recharging, and a network of retailers already in place, mobile companies do appear natural champions. For example, in Zimbabwe, the mobile phone company Econet is planning to roll out a solar 'home power station,' which will provide enough electricity for lighting and cellphone charging. The unit contains a SIM card to communicate with the mobile network and users will pre-pay for energy using mobile payments, removing up-front purchase costs.[14]

As an example of a firm already providing off-grid solutions, Mera Gao Power (MGP) operates in Uttar Pradesh, India. It puts solar panels on the roof of a house, batteries inside the building below and runs wires to other houses in the village to provide power. Four panels are sufficient to provide an entire village of 100 households with two to four LED

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[13] Foster & Briceño-Garmendia, 2010

[14] http://www.newzimbabwe.com/news-6632-Econet+branches+into+solar+power/news.aspx. Off-grid energy provision will require the regulatory leeway to create such power companies. Related to new potential in infrastructure provision, the mobile experience suggests at least one broader policy conclusion for fragile states: the level of regulation that is optimal in developing countries is likely to be considerably below the theoretically optimal level. Mobile telephony in the most competitive market is still concentrated according to the usual measures. The spectrum that is vital to service provision is a limited public good. There are scale economies which suggest the need for (at the least) interconnection regulation. And yet, services have rolled out and the industry has seen dramatically declining prices even in developing country markets where the regulator has completely lacked the capacity to make or enforce pricing, interconnection or pricing regulation. No regulation, then, is often better than bad regulation. If private investors are to expand into off-grid services, this is a lesson that fragile states governments need to absorb.

lights each and mobile phone charging. The microgrid model has a cost per household of about eighty cents per house paid on installation plus fifty cents per week.[15] That compares very favorably to the prices villagers are paying for less convenient, lower quality services today. One mobile charge in the local village costs twenty cents. Unsubsidized kerosene costs about 64 cents a liter, or a little under 30 cents if villagers can find government subsidized supplies.[16] Use a liter of kerosene a week for lighting and the combined costs of mobile charging and kerosene fuel approximately equals MGP's prices. The three advantages of the MGP model are that: you can charge you phone at home; the quality of lighting is *considerably* higher –so that work and study can continue after dark; and the risks are lower – about 2.5 million people are burned by overturned kerosene lamps each year, and inhaling fumes from the lamp has about the same health impact as smoking two packs of cigarettes a day.[17]

MGP hopes it can make back investment costs of about $2,100 per village within eighteen months of setup, with a return on investment of 15% over three years. The MGP financial model depends on 70 percent household take-up at the village level, suggesting strong demand is crucial to rollout. However, energy for lighting does appear to share some of the features that made mobile phones so popular: instant gratification, obvious impact and conspicuous consumption.

5. Conclusion

Under its current model it appears that the IFC may be only rarely catalyzing an investment in fragile states that would not happen without it and infrequently investing in fragile states at all. While (hopefully) it is improving the quality, scale and development impact of those investments which do occur, this is insufficient to suggest the corporation is having a catalytic impact on private sector growth in some of the very countries that need it most.

The above analysis suggests the need to move to 'frontier investments in frontier markets' to scale the level and impact of IFC investments –and perhaps off-grid solar is one such opportunity. Given the apparently limited capacity of the IFC to work with domestic firms in fragile states due to social and environmental safeguard requirements alongside less formal risk hurdles around finance and reputation, that may be more straightforward if they can develop partnership models with their existing client base of mobile telecoms companies to provide distributed energy services.

Such a focus could build on considerable IFC activities in solar and related energy fields. Renewable energy accounted for more than two-thirds of IFC's power sector commitments in FY11 and the IFC has already developed a number of support vehicles in this area

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[15] http://www.guardian.co.uk/global-development/poverty-matters/2012/jan/16/india-solar-power-system

[16] http://saurorja.org/2011/07/18/kerosene-vs-klean-lighting-up-rural-india-cost-and-emission-analysis/

[17] http://flexiwaysolar.com/the-solution-our-solar-powered-led-light/reducing-health-problems/

including the Climate Investment Program for Africa, Lighting Africa and Lighting Asia. Again, the IFC FY2013-15 roadmap calls for a greater focus on off-grid renewable energy in particular. Fragile states could be a major focus of such efforts, hopefully in collaboration with IDA. Were the IFC to help spark an off-grid energy revolution on anything akin to the scale of the mobile phone revolution, the development impact would be immense.

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