



DISPLACED DISTORTIONS: FINANCIAL MARKET FAILURES AND SEEMINGLY INEFFICIENT RESOURCE ALLOCATION

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Finding solutions to market imperfections

NATURE ABHORS A VACUUM, quickly filling it by distributing pressure over space. Similarly, where a vacuum exists in rural financial markets in low-income communities, the pressure resulting from households' limited access to insurance or credit inevitably spreads throughout the rural economy. Those households that lack credit or insurance use other markets and non-market resource allocation mechanisms to resolve, at least partly, their financing problems. This can lead to seemingly significant inefficiencies in resource allocation, or "displaced distortions," such as when poor farmers underutilize their farmland in order to work on other farms for cash.

Informal lending and social insurance arrangements often fill the gaps that exist in formal financial markets, hence the important role such institutions play in rural development. Yet, financing gaps commonly remain, especially for the poorest people, who often find themselves excluded from social networks that make informal credit or insurance available.

When demand for credit or insurance is not met through direct financial services, the poor resourcefully find other means to resolve their latent demand for credit. These displaced distortions of financial markets can, however, have a high cost to the family or community's future welfare. For individuals without savings, their choices are often limited to distress sales of the limited assets they possess, or market participation and investment decisions that provide "quasi-credit" but that have a significant opportunity cost in the future.

This brief enumerates some of the many ways displaced distortions occur in rural Africa. It is important that analysts and policymakers understand the phenomenon of displaced distortions when they observe seemingly irrational behavior in factor or product markets, or in patterns of natural resources exploitation or technology adoption. Appropriate policy responses may not be an intervention directly in the distorted market. Instead, the best response may be to resolve the financial market failures that are the root causes of the seemingly inefficient resource allocation.

Selling low, buying high

The market price for staple grains exhibits a seasonal cycle, typically reaching a low during and immediately following crop harvest and peaking during the growing season. This is natural in even complete and competitive markets, due to storage costs and losses. In many low-income rural areas, however, seasonal price changes far exceed apparent storage losses or interest rates. For example, in Madagascar the mean *quarterly* change in rice prices across the island was 29% in 2001, at a time when mean *annual* interest rate on lending was only 27%.

Clearly, it pays to hold rice stocks in Madagascar. Nonetheless, people do not hold rice stocks in optimal quantities. Individuals unable to borrow or insure themselves against recent losses often sell low just after harvest and subsequently buy high in commodity markets. People can time their sales for maximal

profitability only if they possess sufficient assets to enable them to wait to sell when prices peak during the pre-harvest hungry season and to wait to buy when prices hit their seasonal lows after harvest. With limited savings or credit access, poor households often cannot afford to wait.

Take, for example, the case of a smallholder farmer in Iandratsay, a village in one of Madagascar's prime agricultural regions. This farmer sold paddy at FMG1000/kg to a local collector who transports the paddy by ox cart to an urban wholesaler. Predictably, the farmer runs out of rice three months before his next harvest, and he ends up buying rice back from the same local collector using proceeds from his groundnut and maize crops. Accounting for milling losses, he is paying FMG1850/kg paddy-equivalent. Effectively, then, he buys back in January the rice he sold the preceding June at a premium of 85%. This is the implicit interest rate (including storage losses) on seasonal quasi-credit obtained through the rice market. The core lesson is that when the financial markets fail, people find alternative means of engaging in intertemporal arbitrage, even when it proves very costly.

This farmer's predicament is commonplace. Roughly one-third of Malagasy rice producers buy and sell rice in the same year, leading to significant seasonal flow reversals. In the harvest period, grain flows from rural areas to cities, where commercial traders store grain interseasonally, shipping food back to the rural food-producing areas in the hungry season, once farmers have depleted their own stocks. In so far as seasonal flow reversals are predictable, they reflect significant inefficiency because this round-tripping of staple foods adds transport costs and profit margins for marketing intermediaries. The large scale of seasonal flow reversals in Madagascar reflects major inefficiencies in food marketing due to spatial patterns of interseasonal grain storage—underinvestment in efficient storage capacity in rural areas—and credit availability.

The farmers who routinely sell low and buy high are most commonly the poorest farmers. They can never get ahead by selling when prices collapse after harvest and buying when prices peak. This distortion of their rice marketing behavior impedes accumulation of the savings necessary to buy fertilizer or improved seed or livestock and thereby increase their productivity on the farm, or to invest in an ox cart or a small store that they could use to diversify into higher-return non-farm activities. The lack of seasonal credit, even consumption credit in the hungry season, lies at the heart of this problem.

Consider a milk producer in Ambohimbo, who can sell milk to Tiko, the main national dairy processor, for FMG2000/liter, but has to wait two weeks for payment. Alternatively, she could sell to a local trader for FMG1750/liter, with immediate cash payment. If this were a more conventional loan of FMG1750, with repayment of FMG2000 two weeks later, the implicit interest rate of 14.3% implies an annualized compound interest rate of more than 3,000%! Despite the high rate, this milk producer often opts to sell to the local trader, revealing that her immediate need for cash is sometimes worth the extremely high effective interest rate she pays by selling at a low price for cash.

Farming for others

Financial market failures manifest themselves as displaced distortions of production behaviors as well. Poor farmers who need cash commonly work for wealthier farmers during peak planting and harvesting periods. As a result, they miss the optimal field preparation, planting, weeding and harvesting periods on their own plots. This mis-timing of activities leads to productivity losses. Furthermore, cash-constrained farmers have difficulty hiring laborers during periods of peak labor demand, often having to leave their land idle or work the fields at a slow rate. These productivity losses due to labor mis-timing and under-hiring are a disguised interest rate on the borrowing these farmers engage in through labor markets. If these farmers could borrow in the financial market, they could avoid these losses.

Consider, for example, the difference between two neighbors in Madagascar's southern highlands. One is a single mother of four children. She has two years' education and six *ares* (600m²) of rice land, having had to sell half her land to buy food several years ago. In spite of the limited area she cultivates, she leaves another two *ares* idle because she cannot afford to keep her eldest two children home to work that land; her son treks eight hours to another village to work for cash for several weeks at a time while her daughter finds unskilled work in the nearest town. She cannot afford to hire workers or buy the food to feed reciprocal *entraide* laborers.

Her neighbor has seven children, a wife and an elderly parent to support. He too has only six *ares* of land, but he completed eleven years of education and became a schoolteacher, so he has steady cash and in-kind income from his non-farm employment (many

families pay his wages in rice). He owns a zebu, buys fertilizer and hires workers seasonally to help with his small rice fields, reaping yields more than four times that of his cash-constrained neighbor. These yields, plus the rice he receives for teaching, provide food for his family and enable him to keep his children in school. The two farmers' basic land endowments are identical, but the teacher's regular non-farm income permits him to manage his land optimally and accumulate surpluses sufficient to give his children an even better prospect than he enjoys. By contrast, lacking land, livestock and education, the woman's family almost surely faces a lifetime of grinding poverty.

Farmers who face binding credit constraints also tend not to adopt improved production technologies. Often, these technologies require cash outlays, as when buying improved seed, livestock or mineral fertilizers. Yet, non-adoption due to financing constraints occurs even when no cash outlay is necessary. Many improved agricultural production technologies and natural resources management (NRM) practices initially require only labor inputs. Yet, for the same reason that they commonly mis-time their farming activities, poor farmers seek wage labor for cash now rather than invest time in innovations to improve future yields on their own farms.

This has been observed in the non-adoption of the system of rice intensification (SRI), a method developed in rural Madagascar that increases yields by more than 80%, on average, with no new seed or mineral fertilizers, just an increase in labor for field preparation, planting, and weeding in the initial years following SRI adoption. Despite the considerable expected yield gains, few poorer Malagasy rice farmers have experimented with the method. Ironically, they cannot afford it, though it requires no cash outlay. They must instead seek off-farm wage labor in order to get the cash necessary to buy food for their families during the hungry season. Current credit constraints limit their ability to seize on the promise of greatly increased yields several months down the line.

Similarly, there is a strong positive relationship between farmers' wealth and their likelihood of adopting improved NRM practices in land-scarce areas of the western Kenyan highlands. Practices such as tilling crop residues into the soil, applying manure to cultivated fields, and terracing require labor but not cash. Yet few of the poorer farmers adopt such practices. Once again, they cannot afford to invest the time today in increasing the future produc-

tivity of their own farm because they need to find off-farm employment, even at meager prevailing wages (less than US\$1 a day per adult worker) to meet immediate subsistence needs. The absence of credit for investing in on-farm improvements or consumption credit to meet immediate needs induces underinvestment that results in lower future productivity and persistent poverty.

Facing the loss of assets and natural capital

Depleting one's assets is one of the most common and costly methods of dealing with financial market failure. In the wake of a shock, such as drought, flood, cyclone, pest infestation, or sudden illness, injury or death, a family desperately needs cash. Selling off productive assets could allow the family to meet this immediate need, yet because a loss of assets leads to loss of productivity in the future, poor households typically destabilize consumption intentionally in order to protect productive assets. These families reduce the number and quality of meals they consume or cut back on other basic expenditures before they resort to sale of assets. Yet when the financing gap is too great to weather by reducing expenditures, some households resort to distress sales of key assets, leaving them worse off in the future.

Households also deplete natural capital—the store of wealth held in forests, soils, water and wildlife—when faced with binding credit constraints that impede their ability to conserve scarce natural capital and thereby invest in future productivity. We find a strong positive relationship between change in soil quality and household wealth and income measures in Kenya's central and western highlands. In order to meet immediate needs, farmers sacrifice the quality of the soil on their farms, even past the point where soil rehabilitation is reasonably quick and inexpensive.

Policy interventions

Poor people face difficult decisions when confronted with financial market failures. Seemingly inefficient or short-sighted ways of meeting immediate cash needs can carry a high cost: astronomical implicit interest rates for quasi-credit not available through conventional channels. The displaced distortions of production and exchange behaviors due to financial market failures impede asset accumulation and help perpetuate poverty.



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The standard policy reaction is to create microfinance institutions to fill the financial services lacunae that plague most poor rural communities. Part of the solution may indeed lie in activating rural financial markets, yet a burgeoning evaluation literature offers mixed evidence on the efficacy of microfinance interventions.

Farmers' involvement in certain activities may make it easier to tap into financial networks that already exist. In Embu, in the central highlands of Kenya, for example, tea factories have arranged for payments to be delivered to smallholder growers through a bank account. This has resulted in much greater participation by farmers in formal financial networks, with significant increases in credit access due to the establishment of a relationship between farmers and the banks via the tea payment scheme.

Given the tendency to use commodity and labor markets to resolve credit constraints, interventions in these markets also can help the rural poor avoid paying extreme implicit rates of interest on quasi-credit. For example, commodity price fluctuations partly reflect poor rural infrastructure and storage capacity. Assisting farmers with the installation of paddy or grain banks, or with better on-farm storage, can limit the need to seek credit in the first place by reducing yield depreciation and cutting the costs of distribution.

Well-functioning safety nets—for example, food-for-work projects paying reasonable wages—can be a viable way to create opportunities for surplus labor in the face of adverse shocks to crop and livestock production. Market demand for unskilled labor collapses when drought or flooding occurs. Governments and nongovernmental organizations can use public works schemes to employ idle labor so as to meet the immediate cash needs that drive people into the unskilled wage labor market.

One-off subsidies of adoption of improved production technologies, such as

high-yielding agronomic practices like SRI, can enable households to get a foothold on the ladder out of poverty by surmounting short-term financing constraints that can otherwise trap them indefinitely in low levels of productivity.

Credit and insurance market imperfections can lead people find alternative ways to address consumption needs, which causes displaced distortions of other markets and a negative impact on the productivity and welfare of low-income rural communities. Without access to financial services, people finance necessary expenditures through other markets—notably asset, labor and product markets—and by drawing down non-marketed assets, especially natural resources. This reduces productivity and accumulation, helping to trap people in chronic poverty. The good news is that ways exist to help people break out of the poverty traps associated with these displaced distortions.



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