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Expropriation and the Location of Farmland Investment: a theoretical investigation into the *Land Rush*

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Abstract

The sudden rise in land acquisitions in developing countries during the last decade has drawn the attention of scholars and think tanks. A set of recent papers by Deininger (2011), Deininger (2013), and Arezki et al. (2013) sought to understand the empirical determinants of the *land rush*. They find that investors tend to target countries that have little regard for local land rights. This is a puzzle, given the economic literature on investment location. By locating in such countries, investors may be foregoing other advantages that generate more revenue. What does such a result say about both the nature of the investment projects, and the productive characteristics of the target countries? In this paper, I attempt to answer this question using a game-theoretic model where investors can use expropriation as a credible threat *vis a vis* smallholders, consistent with case studies and empirical data from actual land deals. I show that the credible threat of expropriation lowers the investor's cost of locating to a country by reducing the necessary remuneration to smallholders for access to land, resulting in *adverse incorporation*. Further, I show that investors will locate in countries with weak land governance whenever they anticipate similar levels of revenue among the set of countries they target, or, whenever they can guarantee a similar level of investor protections.

JEL-Classification: F21, O13, Q15, Q34, C79

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1 Introduction

Of late, land acquisitions have drawn the attention of scholars (see e.g. White et al., 2012; Franco et al., 2012), and think tanks (see e.g. Anseeuw et al., 2012; Colchester et al., 2011). Between 2007 and 2008, an observed rise in media reports of land acquisitions accompanied a dramatic rise in food prices (Anseeuw et al., 2012). While scholars from political science (Hall, 2011), and development (Adam, 2013) have compiled case studies of land acquisitions, Deininger (2011), Deininger (2013), and Arezki et al. (2013) used data compiled by various institutions and NGOs to examine which factors determine the likelihood of investos locating in a given country . They find two consistently strong determinants: The *availability of suitable land for cultivation*, and *weak land-governance institutions*, understood as the degree to which a country upholds local land rights. The first of these is intuitive. Suitable land is necessary for the cultivation of crops. The second one however, is contentious. Weak land-governance institutions can reduce costs, but investors may be foregoing other opportunities from better soil quality, the existence of complimentary industries, ports, and roads. This paper is an attempt to understand why this phenomenon emerges from the recent *land rush*, in the context of investment for the cultivation of crops. Given the observation that investors target countries with weak land-governance institutions, what then can one learn about the characteristics of both the investment projects, and the characteristics of the target countries? Under what conditions do weak land-governance institutions dominate the decision of an investor to locate? The objective of this paper is to provide a possible answer to these questions using a game-theoretic model where the investor can choose to expropriate land occupants, should land occupants reject his offer to acquire use-rights to land. By treating these issues theoretically, I provide reasons and conditions that explain empirically observed trends in recent land acquisitions.

1.1 Land Acquisitions and Land Governance

An investor's decision to locate is often a matter of balancing *centripetal*, and *centrifugal* forces (Dembour, 2008). Centripetal forces draw investors into a country. Such factors include public goods (Pieretti and Zanaj, 2011), agglomeration advantages (Haaland and Wooton, 1999; Konrad and Kovenock, 2009), and fiscal incentives such as subsidies (Fumagalli, 2003). In land acquisitions,

the existence public goods such as roads and ports that ensure the delivery of crops can generate large productivity advantages for the investor. Similarly, an investor may find agglomeration advantages where there are related industries such as the existence of processing and milling facilities. While subsidies may not necessarily feature in land acquisitions, other modes of government assistance may be available to investors such as the identification of suitable land. Centrifugal forces are forces that deter investors from locating in a country. Among these are taxes (Pieretti and Zanaj, 2011; Herger et al., 2014), competitors (Bjorvatn and Eckel, 2006), and other costs associated with production such as the strength of bargaining power for labor(Davies and Vadlamannati, 2013).

Weak land-governance institutions, understood as the low degree to which local land rights are upheld in a country (Arezki et al., 2013), serves as a centripetal force when the cost of obtaining use-rights to land refers to more than its nominal market price. An investor may find weak land governance institutions attractive when taking advantage of these makes it easier for him to appropriate land cheaply because he can use the threat of expropriation against a smallholder. This generates a rent for the investor, which may explain his preference for environments with weak land governance[1]. Indeed, many cases of recent land acquisitions suggest that investors are able to take advantage of weak property rights institutions to obtain land from small farmers and indigenous communities.[2]

According to the findings of Anseeuw et al. (2012), the regions most targeted by land deals are in East Africa and Southeast-Asia. East Africa covers about thirty (30) million hectares worth of land deals, and Southeast Asia covers about fifteen (15) million.[3] Ethiopia alone covers about 10% of all the land deals in East Africa, while the Philippines covers about one-third of the land deals in Southeast Asia. These land deals are often directed toward the cultivation of biofuels and cash crops (Lavers, 2012; Borras Jr et al., 2010). Rural inhabitants in both countries have had experience with both coercive activities, and consensual land deals leading to *adverse incorporation*, where smallholders exchange use-rights to land for little to no employment, or access to land (see e.g. Cramb and Curry, 2012; Borras Jr and Franco, 2013).

In the case of Ethiopia, for example, poor systems of titling in certain highland regions create

[1]Glaeser et al. (2003),Sonin (2003) theorize similar behaviors for wealthy actors who may prefer weak property rights institutions.

[2]Some may point out that weak land governance institutions may signal volatility of returns to investment since investors might also suffer expropriation once they locate in a country. The data, however, does not support this reasoning. Investor protections are not significant determinants of investment location (Arezki et al., 2013).

[3]The total stock of land deals worldwide is about 149 million hectares.

conditions under which groups inhabiting and using land cannot prove their ownership or use-rights. Thus, groups that use comunal lands are easily coerced by local governments to consent to lease agreements with investors resulting in the loss of usufruct rights for much of the community(Lavers, 2012). In the Philippines beneficiaries of the country's agrarian reform program are required to pay a supposedly fair price of the land they receive computed by the Land bank of the Philippines. This is done much like a mortgage payment, and it is expected that beneficiaries complete these payments after ten years. Missing three years of payments can result in default, after which, the Land Bank can evict the beneficiary. Often, these payments are significantly higher than what cash strapped, ex landless laborers can afford. Thus, several beneficiaries in the southern island of Mindanao have consented to deals with oil-palm and cash crop investors (Menguita-Feranil, 2013)[4]. While these experiences are rather particular, several authors have compiled case studies and reports of similar expropriatory activities happening where land acquisition occurs(see e.g. White et al., 2012; Cramb and Curry, 2012; Borras Jr and Franco, 2013). These examples combined with the finding that investors tend to locate in countries with poor property rights regimes yield evidence that investors may be taking advantage of weak land governance institutions to cheapen the cost of gaining land-use rights.

Why states allow weak land governance institutions to persist, however, is a matter that I do not treat in this paper. However, it is worth noting some reasons that weak land governance institutions may persist. First, it is possible that the trends so far observed in land acquisitions are responses to existing institutional frameworks which have not had time to improve or develop. This is, in fact, part of the agenda of those that have collected case studies of land acquisitions. Second, maintaining weak land governance institutions may serve the interests of local elites who may themselves facilitate land acquisitions[5]. Thus, politically powerful elites may choose to maintain these institutions if they stand to benefit from land acquisitions, or other extractive activities(Lawson-Remer, 2014). Finally, states may see land acquisitions as a conduit for development which can benefit a larger portion of the population. Thus, governments may be making the calculation that weak land governance for

[4]These deals are often leases that last for decades. In some cases, they can last for more than thirty years (DAR, 2006).

[5]Putzel (1992), for instance, argues that the formation of land reform laws in the Philippines was the product of inter-elite negotiations explicitly excluding peasant organizations from the conversation. Many of the congress members in the Philippines were from landed families

a few smallholders and minority communities will benefit the population at large in the long-run. Whatever the reason, in this paper, I take the institutional environment as a given.

The rest of the paper proceeds as follows: the next section presents a model where an investor decides to locate in a country chosen from a set of countries N. The cost of location depends on the result of a possible contest with a current landowner. Thus, my model exhibits elements of contest success discussed by Hirshleifer (1989), Skaperdas (1996), and Van Long (2013). The structure of the decision process is analogous to the models discussed above on investment location, extended to $n > 2$ countries. I will then conclude by discussing the implications of my results, and possible extensions.

2 The Model

Consider an Investor I making the decision to acquire land from a country $i \in N = \{1...n\}$, where N is simply the set of indices denoting the options of the investor. If he is able to acquire land in some country i, I produces a level of revenue $q_{Ii} > 0$, where $q_{Ii} \in \mathbb{R}^+$, which represents what the investor expects to gain from producing crops in country i depending on upstream market conditions, advantages in supply, and the availability of infrastructure in i[6]. In order to acquire land in any of the i countries in N, I needs to gain the consent of a landowner S_i, who uses her land to produce a level of revenue q_{Si}[7]. I assume that $0 < q_{Si} < q_{Ii}$, which reflects the conventional justification that farmland investment is supposed to generate more productive uses for smallholder land[8].

To get S_i to grant I use-rights to land, I offers S_i a level of remuneration R_i. If S_i refuses to allow I to use land, I can choose to expropriate her. In order to expropriate the landowner, I, invests in expropriation effort e_{Ii}, while S_i invests effort in defense e_{Si}. The contest is costly to both players, and this cost is determined by the institutional characteristics of country i. Specifically, the per-unit cost to I's expropriation effort is given by a parameter $0 \leq \tau_i \leq 1$, which is a measure of the strength of land institutions that protect the ownership of S_i. The cost to S_i, on the other hand is given by

[6] If an investor is an exporter who delivers crops to one country where the price of his crops are set, then the revenue from locating in country i is $q_{Ii} = \rho\psi_{Ii}$ where ρ is the price of the crops, and ψ_{Ii} is the quantity that he can produce in country i given the various conditions in i.

[7] Alternatively, we could think of these as a *group of smallholders* who bargain together.

[8] see e.g. Colchester et al. (2011), and Borras Jr et al. (2010).

$(1-\tau_i)$. Modelling costs in this way ensures that better institutional environments reduce the burden of defense for the landowner in i while increasing the burden of expropriation on I[9]. Should I win the contest, he gets to implement his project while the landowner gets 0. The opposite holds true in the case that the landowner wins. Success in defense and expropriation, respectively, are given by the following functions:

$$p_{S_i}(e_{Si}, e_{Ii}) = \begin{cases} \frac{e_{Si}}{e_{Si}+e_{Ii}} & \text{if } (e_{Si}, e_{Ii}) \geq (0,0) \\ \frac{1}{2} & \text{if } (e_{Si}, e_{Ii}) = (0,0) \end{cases}$$

For S_i, and,

$$p_{I_i}(e_{Si}, e_{Ii}) = \begin{cases} \frac{e_{Ii}}{e_{Si}+e_{Ii}} & \text{if } (e_{Si}, e_{Ii}) \geq (0,0) \\ \frac{1}{2} & \text{if } (e_{Si}, e_{Ii}) = (0,0) \end{cases}$$

Notice that $p_{I_i}(e_{Si}, e_{Ii}) = 1 - p_{S_i}(e_{Si}, e_{Ii})$. Further, each of these functions increase in each player's effort, and decrease in the opposing party's effort level. Thus, we can think of these functions as success probabilities, or, a proportion of a parcel of land that can be won through the contest[10]. The game is summarized by the following sequence:

1. I chooses to invest in one of countries $i \in N$
2. Once I decides on a country, I must offer S_i a level of remuneration R_i.
3. S_i can then choose to either accept or reject R_i.
4. I and S_i, enter a contest. I chooses how much to invest in expropriation e_{Ii}, while S_i decides to invest in defense effort e_{Si}.
5. If I is successful in expropriation, he will be able to reap profits from producing q_{Ii}. On the other hand, if I is unsuccessful, he gets 0, while S_i is able to produce q_{Si}.

[9]One may also use an alternative specification where landowners have a country-specific cost borne by both the landowner (e.g. c_{Si}) and the investor, (say, c_{Ii}). In this case, worse institutional environemnets would mean higher costs. However, this framework does not enjoy the intuitive quality that the institutional environment, while a possible bane for the landowner, can act as a boon for the investor.

[10]The functional form fits the general ratio-form of a *contest success function (CSF)* with a mass effect parameter of 1. This suggests that there is diminishing returns to effort exerted on expropriation or defense(Hirshleifer, 1989).

I solve this game via backward induction. I will first demonstrate the results from expropriation. This will serve as the fallback position for the landowner in country i. I will then deduce the level of profits that the investor can expect in each country $\imath \in N$, given that country's land governance characteristics defined by τ_i. Finally, I examine under what conditions the investor will target the country with the lowest level of τ_i.

2.1 Expropriation and Adverse Incorporation

In deciding their respective levels of effort in defense and expropriation, S and I solve the following optimization problems simultaneously:

$$max_{e_{Si}} p_{S_i}(e_{Si}, e_{Ii}) q_{Si} - (1 - \tau_i) e_{Si} \tag{1}$$

for S_i, and

$$max_{e_{Ii}} p_{I_i}(e_{Si}, e_{Ii}) q_{Ii} - \tau_i e_{Ii} \tag{2}$$

The optimization implies the following results for the effort levels:

Lemma 1 *The optimization problem characterized by equations (1), and (2) yield the following equilibrium level of efforts, and success.*

- $e^*_{Si} = q_{Ii}\tau_i(\frac{q_{Si}}{\nu_i})^2$, *with* $p_{S_i}(e^*_{Si}, e^*_{Ii}) = \frac{q_{Si}\tau_i}{\nu_i}$
- $e^*_{Ii} = q_{Si}(1 - \tau_i)(\frac{q_{Ii}}{\nu_i})^2$, *with* $p_{I_i}(e^*_{Si}, e^*_{Ii}) = \frac{q_{Ii}(1-\tau_i)}{\nu_i}$

Where $\nu_i = q_{Si}\tau_i + q_{Ii}(1 - \tau_i)$.

These levels of effort are equivalent to a proportion of the rewards that the opponent of each player expects from engaging in expropriation. We can also make the following observation:

Lemma 2 *The following hold for the success probabilities:*

1. $\frac{dp_{S_i}(e^*_{Si}, e^*_{Ii})}{d\tau_i} > 0$
2. $\frac{dp_{I_i}(e^*_{Si}, e^*_{Ii})}{d\tau_i} < 0$

Corollary 1 *The expected payoffs from the expropriation round are*

- $\pi^r_{Si} = q_{Si}\left(\frac{q_{Si}\tau_i}{\nu_i}\right)^2$ *for* S_i.
- $\pi^r_{Ii} = q_{Ii}\left(\frac{q_{Ii}(1-\tau_i)}{\nu_i}\right)^2$ *for* I *in* i.

Corollary 2 $(e^*_{Si}, e^*_{Ii}) = (0,0)$ *is not an equilibrium.*

The preceding corollary says that I always has an incentive to expropriate S_i. It is easy to show that $\pi^r_{Si} < q_{Si}$[11]. The possibility of expropriation lowers the rewards for the landowners. Since I needs to offer a level of remuneration R_i, he chooses R_i to satisfy the following:

$$R_i \geq \pi^r_{Si} \tag{3}$$

Since there is no reason for I to offer a higher level of remuneration to S_i than she would get if she rejects the deal, we can assume that (3) holds with equality. This shows that the capacity of I to expropriate S_i compels S_i to accept a level of remuneration that is lower than what she could produce on her own. Even if S_i voluntarily agrees to allow I to use her assets (in this case, land) for a productive activity, she does so under an arrangement which may leave her no better or even worse-off than she would have been otherwise. In effect, the investor's ability to expropriate the landowner, due to the existing institutional environment in the country allows him to reduce the costs of location. The credible threat of expropriation, thus, allows the investor to exercise a form of *event power* over the landowner by changing the landowner's fallback position, and thus, lowering her payoffs(Bartlett, 2006).

2.2 Profits, and The Choice of Location

Given the derivations above, the resulting profits for I when he locates to i is given by the following equation:

$$\pi_{Ii} = q_{Ii} - q_{Si}\left(\frac{q_{Si}\tau_i}{\nu_i}\right)^2$$

It is easy to show that the following holds:

[11]This is because $p_{S_i}(e^*_{Si}, e^*_{Ii}) < 1$, and $\pi^r_{Si} = q_{Si}p^2_{S_i}(e^*_{Si}, e^*_{Ii})$.

Lemma 3

$$\frac{d\pi_{Ii}}{d\tau} < 0$$

The preceding Lemma states that the profits of the investor decrease with τ. This result implies that, all else equal, the investor will choose the country where the institutional protections for the landowners are poor. However, in keeping with the literature on investment location, differences in productive advantages such as road networks, existing infrastructure, and prices of labor can be stronger determinants of I's location decision, rather than the costs associated with obtaining land. Thus, I should weigh differences in q_{Ii} against the differences in costs associated with τ_i and q_{Si}. It is necessary, then, to examine under what conditions can the ease of expropriation overcome other disadvantages that a country $i \in N$ may have against other candidates in N.

In general, I chooses his location depending on where profits are greater. The condition, then, for I to choose a country $i \in N$ is given by the following criteria:

$$q_{Ii} - q_{Si}\left(\frac{q_{Si}\tau_k}{\nu_i}\right)^2 > q_{Ik} - q_{Sk}\left(\frac{q_{Sk}\tau_k}{\nu_k}\right)^2 \tag{4}$$

For every $k \neq i, k \in N$. Now, define $\tau_m = min\{\tau_i | i \in N\}$. Given the observation that poor land governance, interpreted in the model as τ_i, is a major driver in attracting farmland investment, it is necessary to examine the conditions under which I chooses to locate in m due to the advantages brought about by τ_m. The following result gives conditions under which poor property rights governance can overcome possible disadvantages in country m.

Proposition 1 *I locates in m if and only if the following conditions hold:*

1. *For all $i \neq m, i \in N$*

$$q_{Ii} - q_{Si}\left(\frac{q_{Si}\tau_k}{\nu_i}\right)^2 > q_{Ik} - q_{Sk}\left(\frac{q_{Sk}\tau_k}{\nu_k}\right)^2$$

   holds, and

2. *For all $j \in N, j \neq m$ such that $q_{Ij} \geq q_{Im}$, there exists a k for which $q_{Ik} \geq q_{Im}$, and*

$$q_{Ij} - q_{Im} < q_{Sk}$$

The first part of Proposition 1 follows directly from (4). The second part suggests that among the countries in N, I will locate in the country where local land rights are least respected only if the revenue differences between that country and any other country where the investor can gain a higher level of revenue are small. The size of this difference is bounded above by the revenue that some landowner (or group of smallholders) can produce on their own in one of the countries where the investor can gain a higher level of revenue. The intuition behind this result is that the ability to expropriate should overcome any possible advantages in revenue that other countries in the set N may offer. In choosing a location, the investor weighs the differences in revenue against the differences in costs. In order for expropriation to be a relevant metric, it has to be the case that the cost reduction from locating in a country with weak protections for local landholders is greater than the opportunity cost of foregoing a higher level of revenue. Otherwise, I would not locate in m.

One must make a distinction about the implications of the first and second part of Proposition 1. The former states that I will choose country m among the countries in set N if the differences in the levels of revenue are small enough in *every* country in the set. This condition applies to each individual country, but it does not yield any information about the set of targeted countries *as a whole*, or, the intended investments which make countries in N appropriate targets. The second part allows us to deduce that the differences between levels of q_{Ii} are small enough so that the ease of expropriation becomes a relevant metric by which I makes his choice of location.

In the context of the recent land rush, many investment projects are targeted toward producing food for the investor's country of origin, or bio-fuel and flex-crops for export(Hallam, 2011; Robertson and Pinstrup-Andersen, 2010). Thus, the expected gains from the cultivation and sale of these crops may have a high degree of homogeneity. Under such circumstances cost considerations would dominate the choice of location since the level of q_{Ii} depends on factors outside country i as well, such as the price of crops. That is, if $q_{Ii} = \rho\psi_{Ii}$ where ρ is the price of the crops in the export location, and ψ_{Ii} is the quantity that he can produce in country i given the various conditions in i, then, it has to be the case that $\psi_{Ij} - \psi_{Im} < q_{Sk}/\rho$, for any country where $\psi_{Ij} \geq \psi_{Im}$. $\psi_{Ij} - \psi_{Im}$ can be small when the countries targeted have little by way of infrastructure and agglomeration advantages. Thus, the characteristics of the target countries in terms of generating revenue may be very similar, making the ability to expropriate an important determinant in the choice of location.

This result may also explain why Arezki et al. (2013) find that the *yield gap* does not have a consistent effect on the choice of location. The yield gap is the difference between the land's current level of productivity, given agro-climactic conditions, and the level it could achieve with the use of better capital, fertilizer, machinery, etc.This would affect the choice of location if investors seek to take advantage of existing activities by introducing capital, technology, and expertise. In other words, these are differences in q_{Ij} and q_{Sj}. Without expropriation, the game suggests that the investor should pay a landowner the full value of her own cultivation q_{Sj}. If q_{Ij} is high enough, it may justify the cost of offering $S_j, R_j = q_{Sj}$. However, with the opportunity to expropriate landowners in another country m, the investor may find that the opportunity cost of a higher level of revenue in country j could be offset by lowering the payments to smallholders in m. Thus, the yield gap may not have an effect on the choice of location because a place with a low yield gap, but with excellent institutions may mean lower profits for I than a place with a low yield gap but worse institutions.

The qualitative results from this section suggests that the trends in recent land acquisitions are consistent with investors acquiring land for the cultivation of crops of similar value. This would be the case for land acquisitions directed toward export markets, or, food markets in the investor's home country. In this case, if the set of location choices are similar enough in their productivity advantages, then, investors may take advantage of cost reductions from the ease of expropriation. However, once the investor locates to a country i, he may be subject to the same protections as the landowner there. The next subsection addresses this issue.

2.3 Investor Insecurity

Weak land governance institutions can deter investments if the investor anticipates the possibility of losing q_{Ii} once he locates in i. Such an institutional deficiency, can discourage, rather than encourage investments. We can think of property rights volatility for I as reductions in q_{Ii}. In this case, I will have to weigh the anticipated risks of locating in i against the benefits of reduced costs due to the ease of expropriation.

To model this problem, consider the possibility that once I obtains use-rights to S_i's land, then he anticipates that some other player in i designated as A_i will attempt to expropriate him. Let ϕ_i be the degree of investor protections in i where $\tau_i \leq \phi_i < 1 \forall i \in N$. I define the bounds for ϕ_i

so that I anticipates that he will have some institutional guarantees, at least equivalent to that of landowners in country i. The cost to I, then, of protecting his investment in i at any given period is $(1-\phi_i)$. Should A_i succeed in expropriating I, she produces $q_{Ai} \in [q_{Si}, q_{Ii}]$. I make this assumption due to the following intuition: I's investments may add value to the productivity of land. However, this value may not include upstream markets which were available to I. Thus, if A_i expropriates I successfully, then, she may be able to benefit from whatever fixed costs that I put in place, but, she may not be able to take advantage of upstream markets to which I may have had access.

The levels of success in expropriation and defense by A_i and I respectively are given by the following functions, similar to the contest between I and S_i:

$$p_{A_i}(e_{Ai}, e_{Ii}) = \begin{cases} \frac{e_{Ai}}{e_{Ai}+e_{Ii}} & \text{if } (e_{Ai}, e_{Ii}) \geq (0,0) \\ \frac{1}{2} & \text{if } e_{Ai} = e_{Ii} = 0 \end{cases}$$

For A_i, and,

$$p_{I_i}(e_{Ai}, e_{Ii}) = \begin{cases} \frac{e_{Ii}}{e_{Ai}+e_{Ii}} & \text{if } (e_{Ai}, e_{Ii}) \geq (0,0) \\ \frac{1}{2} & \text{if } e_{Ai} = e_{Ii} = 0 \end{cases}$$

For I. A similar process of optimization as defined previously leads to the following results:

Lemma 4 *When I faces a certain level of property rights volatility in country i, ϕ_i, his revenue, $q_{\phi_i Ii}$ is given by:*

$$q_{I\phi i} = q_{Ii}\left(\frac{q_{Ii}\phi_i}{v_i}\right)^2 \tag{5}$$

Where $v_i = q_{Ii}\phi_i + q_{Ai}(1-\phi_i)$.

As with the case of the landowner's payoffs, we can deduce that $\frac{dq_{\phi_i Ii}}{d\phi_i} > 0$[12]. The expected profits of I from locating in i is given as:

$$\pi_{I\phi i} = q_{I\phi i} - q_{Si}\left(\frac{q_{Si}\tau_i}{\nu_{\phi i}}\right)^2$$

Where $\nu_{\phi i} = q_{Si}\tau_i + q_{I\phi i}(1-\tau_i)$. The general condition for I to choose m which $\tau_m = min\{\tau_i | i \in N\}$

[12]Specifically, $\frac{dq_{\phi_i Ii}}{d\phi_i} = 2\phi_i q_{Ai}(\frac{q_{Ii}}{v})^3$

over any $i \in N$ is given, then, by:

$$q_{I\phi m} - q_{Sm}\left(\frac{q_{Sm}\tau_m}{\nu_{\phi m}}\right)^2 > q_{I\phi i} - q_{Si}\left(\frac{q_{Si}\tau_i}{\nu_{\phi i}}\right)^2 \tag{6}$$

One can see that the results from the previous section continue to hold, with some qualitative differences due to institutional protections for I (ϕ_i), and the expected payoffs of A_i (q_{A_i}).

A case of particular interest is when $q_{Ai} = q_{Ii}$, and $q_{Ii} = q_I \forall i \in N$. This case can be understood as follows: the investor anticipates that he will be able to take advantage of the same productivity in all counties in the set of options N. However, his expected payoffs from locating in country i fall due to poor investor protections given by ϕ_i. So, I faces the risk of losing his investments to A_i, who, I anticipates, would undergo expropriation to gain the full value q_I. There are a variety of contexts where such a calculation is relevant. For example, it may be the case that I anticipates the possibility of confiscation due to nationalistic laws which prevent him from owning land. Or, he might anticipate the election of a government in i that is hostile to foreign investors. Given this context, (5) becomes $q_I\phi_i^2$, since $v_i = q_I$. Assume that $\forall i \in N, q_{Ii}\phi_i^2 > q_{Si}\left(\frac{q_{Si}\tau_i}{\nu_{\phi i}}\right)^2$, so that profits are positive in any country i in the set N. We can rewrite (6) as:

$$\phi_m - \phi_k > \frac{1}{q_I(\phi_m + \phi_k)}\left(q_{Sm}\left(\frac{q_{Sm}\tau_m}{\nu_{\phi m}}\right)^2 - q_{Sk}\left(\frac{q_{Sk}\tau_k}{\nu_{\phi k}}\right)^2\right) \tag{7}$$

Which is the general condition for I to choose m, for which $\tau_m = min\{\tau_i | i \in N\}$. The next result is analogous to Proposition 1, and is proven using equation (7).

Corollary 3 *Let m denote the country for which $\tau_m = min\{\tau_i | i \in N\}$. If $q_{Ai} = q_{Ii}$, and $q_{Ii} = q_I \forall i \in N$, then I chooses m over all $i \in N, i \neq m$ if and only if for every $i \in N$, equation (7) holds, and, for every $j \in N$ such that $\phi_j > \phi_m$, there exists a $\beta < 1$ such that $\phi_j - \phi_m < \beta$*

Corollary 3 states that when I anticipates some level of expropriation, given that the only advantages he may anticipate in any country i are due to investor protections, then, I chooses a country with the weakest local land governance τ_m, if he believes that any other country's advantage in offering investor protections are small. This corollary illustrates a limit to the volatility that investors are willing to take when making their choice of location. Countries with insecure property rights for

local landowners and smallholders may be attractive, to the extent that the investor can expect some relative institutional stability. This is why they may target countries with poor land governance institutions, but with governments that can guarantee, with some certainty, that their investments are safe. Corollary 3 may also explain why certain countries which exhibit high property rights insecurity are not the targets for land acquisition. It may be because the level of insecurity in countries where there are high-intensity conflicts are too pronounced, so as to make the cost advantage of acquiring land negligible. This result is consistent with (Arezki et al., 2013) who find that investor protections are not a significant determinant of farmland investment. What my result suggests is that this may be due to the fact that the group of countries that investors target may be similar enough so that such considerations are irrelevent to the choice of location. The results imply that I will not choose countries which cannot guarantee a certain level of investor protections. However, he may choose relatively weaker investor protections if the reductions in the cost of location outweigh the relative gains due to investor protection.

The previous results are based on the assumption that there are differences in the institutional environment for I, and S_i. However, there may be reasons to think that investors account for τ_i as their own risk factor as well. In the empirical exercises that explored the land rush, the institutional factors in some of the databases were generated by surveying businessmen and bankers(Arezki et al., 2013)[13]. These institutional factors include things such as the number of land disputes, and the adjudications resulting in land transfers. Thus, investors may not necessarily expect that they will face a different institutional environment in a country i from S_i. Under what conditions, then, would investors choose to locate in countries with poor property rights governance, if they anticipate the same level of vulnerability as current land-wners in i? The next two results suggest a partial answer to the question, where investors anticipate gains from producing q_I in all countries, and differences in the level of revenue are due solely to differences in τ_i.

Corollary 4 *Let m denote the country for which $\tau_m = min\{\tau_i | i \in N\}$. If $q_{Ai} = q_{Ii}$, and $q_{Ii} = q_I \forall i \in N$, then I chooses m over all $i \in N, i \neq m$ if and only if for every $i \in N$, equation (7) holds, and, for every $i \in N$ there exists a $\beta_\tau < 1$ such that $\tau_i - \tau_m < \beta_\tau$*

These last corollaries are proved in the same fashion as Proposition 1. These results suggest that

[13]The paper also includes a thorough online appendix which describes the data.

when I expects to face the same institutional environment as S_i, he may still choose to locate in the country where the institutional quality is the lowest, if, the range of τ_i is small enough to ensure that he gains from the ease of location. Thus, there is a degree of *institutional proximity* among the set of countries N that justifies choosing the country with the poorest property rights governance.

3 Implications and Conclusion

Empirical investigations into the determinants of recent land acquisitions find that the quality land governance, interpreted as the degree to which local land rights are respected, has a negative and significant impact on the likelihood of farmland investment locating in a given country. This finding is counter-intuitive, considering the literature on property rights, and the literature on the location of investment. The literature on property rights suggests that poor property rights regimes may introduce disincentives to invest, due to reductions in the anticipated benefits. The literature on investment location shows that investors do not necessarily choose countries where institutional weaknesses allow them to gain cost advantages. Rather, investors may choose countries which offer productivity and supply chain advantages.

Given these findings from past literature, however, numerous case studies have elucidated the role of expropriatory activity in land-acquisitions for farmland investments. In this essay, I have made an attempt to show that under some circumstances, the ability to expropriate can explain why investors may favor countries with poor land-governance. The benefits of choosing a country with poor land governance allows an investor to gain access to land at a lower cost. Expropriation, or its threat, compels local landowners to accept levels of remuneration that are worse than what they could have achieved, given the resources at their disposal. Scholars from other fields have dubbed this result as *adverse incorporation*. Adverse incorporation tends to occur when land deals arise without free, prior, and informed consent, or, when land institutions leave room for expropriatory activity. There have been numerous studies on the link between Foreign investment and repression. Harms et al. (2002),Busse (2004), and Busse et al. (2011) find that the link is negative. Greater democratic rights are linked with higher levels of FDI. On the other hand Sorens and Ruger (2012) finds that there is positive link between FDI and repression, but it is statistically insignificant. In the context of

the land rush, investors may not be engaging in violent activities per se. As the cases that I cited in Ethiopia in the Philippines show, these methods of obtaining land are not violent, but involve taking advantage of defects in land governance. Put another way, the costs to expropriation may be very low for I, and very high for S_{Ii}. In the model, expropriation need not occur. Only its credible threat is necessary for landowners to accept levels of remuneration that leave them no better or even worse-off than they would have been otherwise.

The main results of the paper demonstrate that the empirical findings from the literature on farmland investment may reflect growing demand for certain crops, rather than a secular trend in agricultural investment. Investors will favor countries where expropriation cheapens the cost of location, only if their expected revenues in the set of countries they are targeting are close enough to merit a decision based on cost reductions. This implication should give some reason for optimism. There is a limit to how much a country's willingness to disregard land-rights can attract investors. These limits are set by other factors that can contribute to increases in an investor's expected revenue. Thus, the findings from the literature on investment location continue are relevant and complimentary bto the findings of this model. There are many ways to attract investment, and these need not involve taking advantage of institutional weaknesses. However, these other means of attracting investment may entail spending on public goods such as roads, and ports. If a country faces tight budget constraints, investment by any means necessary can be quite appealing. The problem of how ought a government make these decisions, and how it sets a country's institutional characteristics is one of interest. Such an exercise may prove to be an interesting and difficult problem in the context of land acquisitions. This is because land acquisitions, in the context of farmland investment, may be a question not only of payments, but of types of arrangements that current land-users would face after the acquisition. They may end up working under the investor, or even growing crops for him. Thus, governments may face the problem of setting both the institutional environment for acquisition, and bargaining after the acquisition takes place.

This paper also points out that policy makers should be wary about farmland investments. If these investments seek to take advantage of weak property rights institutions, then, they may not be able to generate the productivity gains that are often used to justify their attraction. If the objective of attracting farmland investments is to increase agricultural productivity and raise the welfare of

rural smallholders, then, states should ensure, at the very least, that there is a suitable environment for smallholders to bargain with investors. This may entail a rigorous determination of existing informal and formal land institutions in order to ensure the welfare of all parties which have a stake in the acquisition of land. States may also monitor whether jobs and infrastructure, often promised in a land deal, actually materialize within a reasonable amount of time. The problem however is that states may depend on these deals to raise revenue, and that attracting investment *per se* can become the objective rather than ensuring its positive spillovers in job creation and infrastructure development. In this case, states may fail to monitor investments and consent to expropriatory activity. Once again, this entails explicitly modelling the state as a player in the game, with its own set of motivations and strategies.

4 Appendix: Proofs

PROOF of Lemma 1: The first order conditions implied by equations (1), and (2) are:

$$\frac{e_{Ii}}{(e_{Si}+e_{Ii})^2}q_{Si} = (1-\tau_i)$$

and,

$$\frac{e_{Si}}{(e_{Si}+e_{Ii})^2}q_{Ii} = \tau_i$$

This implies that $e_{Ii} = e_{Si}\frac{q_{Ii}(1-\tau_i)}{q_{Si}\tau_i}$. Using either first order condition, we can get the following equations:

$$e_{Si} = q_{Ii}\tau_i\left(\frac{q_{Si}}{\tau_i q_{Si}+(1-\tau_i)q_{Ii}}\right)^2$$

and

$$e_{Ii} = q_{Si}(1-\tau_i)\left(\frac{q_{Ii}}{\tau_i q_{Si}+(1-\tau_i)q_{Ii}}\right)^2$$

These implies the stated results. I obtain the equilibrium levels of success by plugging these in to the functions $p_{S_i}(e_{Si}, e_{Ii})$, and $p_I(e_{Si}, e_{Ii})$.$\triangle$

PROOF of Lemma 2: First, we note that $\frac{d\nu_i}{d\tau_i} = -\tau_i(q_{Ii} - q_{Si}) < 0$. Now,

$$\frac{dp_{S_i}(e^*_{Si}, e^*_{Ii})}{d\tau_i} = \frac{q_{Si}\nu_i - \frac{d\nu_i}{d\tau_i}q_{Si}\tau_i}{\nu_i^2} > 0$$

and

$$\frac{dp_{I_i}(e^*_{Si}, e^*_{Ii})}{d\tau_i} = \frac{-q_{Ii}\nu_i - \frac{d\nu_i}{d\tau_i}q_{Ii}(1-\tau_i)}{\nu_i^2} = \frac{-q_{Ii}(1+\tau_i(1-\tau_i) - q_{Ii}q_{Si}\tau_i(1-\tau_i)}{\nu_i^2} < 0$$

$\triangle$

Note that the proof for Lemma 4 is similar, and to the proof for these two previous lemmas, and is therefore ommitted.

PROOF of COROLLARY 1: substituting the equilibrium levels of $e^*_{Si}, p_{S_i}(e^*_{Si}, e^*_{Ii}), e^*_{Ii}, p_{I_i}(e^*_{Si}, e^*_{Ii})$ from LEMMA 1 into equations (1), and (2), we get S_i's payoff from rejecting I's offer:

$$\pi^r_{Si}(e^*_{Si}, e^*_{Ii}) = \left(\frac{q_{Si}\tau_i}{\nu_i}\right)q_{Si} - \tau_i\left(q_{Ii}\tau_i\left(\frac{q_{Si}}{\nu_i}\right)^2\right)$$

and I's payoff

$$\pi^r_{Ii}(e^*_{Si}, e^*_{Ii}) = \left(\frac{q_{Ii}(1-\tau_i)}{\nu_i}\right)q_{Ii} - (1-\tau_i)\left(q_{Si}(1-\tau_i)\left(\frac{q_{Ii}}{\nu_i}\right)^2\right)$$

Simplifying these equations gives the result.$\triangle$

PROOF for COROLLARY 2: Suppose not. Then, $(e^*_{Si}, e^*_{Ii}) = 0$. Let S_i deviate and choose $e^*_{Si} > 0$. Then, she receives the full value of q_{Si} while I receives $0 < \pi^r_{Ii}$. So, I's best response is to choose $e_{Ii} > 0$. Similarly, the best response of S_i to I choosing $e_{Ii} > 0$ is to choose $e_{Si} > 0$. This yields the payoffs from Corollary 1.$\triangle$

PROOF of Lemma 3: $\frac{d\pi_{Ii}}{d\tau} = -2q_{Si}\frac{dp_{S_i}(e^*_{Si}, e^*_{Ii})}{d\tau_i}p_{I_i}(e^*_{Si}, e^*_{Ii}) < 0$, following Lemma 2.$\triangle$

PROOF of Proposition 1: To prove this, we first show that if if the two conditions hold, then, I locates in m. This direction immediately follows from equation (4). That is, if the first condition holds for all countries $i \neq m$, then I locates to m.

Now, suppose I locates in m. It has to be the case that equation (4) holds. Now consider every country $j \in N$ with $q_{Ij} > q_{Im}$. Equation (4) implies that:

$$q_{Ij} - q_{Im} < q_{Sj}\left(\frac{q_{Sj}\tau_j}{\nu_j}\right)^2 - q_{Sm}\left(\frac{q_{Sm}\tau_m}{\nu_m}\right)^2$$

Consider the set $J = \{j \in N | q_{Ij} > q_{Im}\}$ We can arrange the elements of J so that the set $\{1, ...p\}$ corresponds to the indices of J where the elements of J are arranged as follows: $\{q_{I1} \leq q_{I2} \leq ... \leq q_{Ip}\}$ Let $B_j = q_{Sj}\left(\frac{q_{Sj}\tau_j}{\nu_j}\right)^2 - q_{Sm}\left(\frac{q_{Sm}\tau_m}{\nu_m}\right)^2$. Then, we have:

$$\begin{aligned} q_{I1} - q_{Im} &< B_1 \\ q_{I2} - q_{Im} &< B_2 \\ &... \\ q_{IP-1} - q_{Im} &< B_{P-1} \\ q_{IP} - q_{Im} &< B_P \end{aligned} \tag{8}$$

Let $B_{max} = max_{j \in J} B_j$. Certainly: $q_{IP} - q_{Im} < B_P < B_{max}$. Since $q_{I1} - q_{Im} \leq ... \leq q_{IP} - q_{Im} < B_P \leq B_{max}$, and by definition $B_{max} < q_{Sk}$ for some $k \in J$. The proofs for Corollaries 2, and 4 are similar. However, we note that

$$\frac{1}{q_I(\phi_m + \phi_h)}\left(q_{Sm}\left(\frac{q_{Sm}\tau_m}{\nu_{\phi m}}\right)^2 - q_{Sh}\left(\frac{q_{Sh}\tau_h}{\nu_{\phi h}}\right)^2\right) < 1$$

by the assumption that $\forall i \in N, q_{Ii}\phi_i^2 > q_{Si}\left(\frac{q_{Si}\tau_i}{\nu_{\phi i}}\right)^2$, which ensures the profitability of locating in any country $i \in N$. This implies that $q_I(\phi_m + \phi_h) > q_{Sm}\left(\frac{q_{Sm}\tau_m}{\nu_{\phi m}}\right)^2$, and $q_I(\phi_m + \phi_h) > q_{Sh}\left(\frac{q_{Sh}\tau_h}{\nu_{\phi h}}\right)^2$. For Corollary 4, by definition of τ_m, the inequality holds for all $i \in N$.$\triangle$

References

Adam, J. (2013). Land reform, dispossession and new elites: A case study on coconut plantations in Davao Oriental, philippines. *Asia Pacific Viewpoint*, 54(2):232–245.

Anseeuw, W., Boche, M., Breu, T., Giger, M., Lay, J., Messerli, P., and Nolte, K. (2012). Transnational land deals for agriculture in the global south. analytical report based on the land matrix database. *The Land Matrix Partnership, http://landportal. info/landmatrix/media/img/analyticalreport. pdf*.

Arezki, R., Deininger, K., and Selod, H. (2013). What drives the global land rush? *The World Bank Economic Review*, page lht034.

Bartlett, R. (2006). *Economics and power: An inquiry into human relations and markets*. Cambridge University Press.

Bjorvatn, K. and Eckel, C. (2006). Policy competition for foreign direct investment between asymmetric countries. *European Economic Review*, 50(7):1891–1907.

Borras Jr, S. M. and Franco, J. C. (2013). Global land grabbing and political reactions from below. *Third World Quarterly*, 34(9):1723–1747.

Borras Jr, S. M., McMichael, P., and Scoones, I. (2010). The politics of biofuels, land and agrarian change: editors' introduction. *The Journal of Peasant Studies*, 37(4):575–592.

Busse, M. (2004). Transnational corporations and repression of political rights and civil liberties: An empirical analysis. *Kyklos*, 57(1):45–65.

Busse, M., Nunnenkamp, P., and Spatareanu, M. (2011). Foreign direct investment and labour rights: a panel analysis of bilateral fdi flows. *Applied Economics Letters*, 18(2):149–152.

Colchester, M., Chao, S., Dallinger, J., Toh, S. M., Chan, K., Saptaningrum, I., Ramirez, M. A., and Pulhin, J. (2011). Agribusiness, large-scale land acquisitions, and human rights in Southeast Asia. General publication, Forest People's Programme.

Cramb, R. and Curry, G. N. (2012). Oil palm and rural livelihoods in the Asia–Pacific region: An overview. *Asia Pacific Viewpoint*, 53(3):223–239.

DAR (2006). Case studies on agribusiness venture agreements (AVA's) between investors and agrarian reform beneficiaries (arb's). Technical report, Department of Agrarian Reform Policy and Strategic Research Service Economic and Socio-Cultural Research Division, Philippines.

Davies, R. B. and Vadlamannati, K. C. (2013). A race to the bottom in labor standards? an empirical investigation. *Journal of Development Economics*, 103:1–14.

Deininger, K. (2011). Challenges posed by the new wave of farmland investment. *The Journal of Peasant Studies*, 38(2):217–247.

Deininger, K. (2013). Global land investments in the bio-economy: evidence and policy implications. *Agricultural Economics*, 44(s1):115–127.

Dembour, C. (2008). Competition for business location: a survey. *Journal of Industry, Competition and Trade*, 8(2):89–111.

Franco, J. C. et al. (2012). Global land grabbing and trajectories of agrarian change: A preliminary analysis. *Journal of Agrarian Change*, 12(1):34–59.

Fumagalli, C. (2003). On the welfare effects of competition for foreign direct investments. *European Economic Review*, 47(6):963–983.

Glaeser, E., Scheinkman, J., and Shleifer, A. (2003). The injustice of inequality. *Journal of Monetary Economics*, 50(1):199–222.

Haaland, J. I. and Wooton, I. (1999). International competition for multinational investment. *The Scandinavian Journal of Economics*, 101(4):631–649.

Hall, D. (2011). Land grabs, land control, and Southeast Asian crop booms. *Journal of peasant studies*, 38(4):837–857.

Hallam, D. (2011). International investment in developing country agricultureissues and challenges. *Food Security*, 3(1):91–98.

Harms, P., Ursprung, H. W., et al. (2002). Do civil and political repression really boost foreign direct investments? *Economic Inquiry*, 40(4):651–663.

Herger, N., Kotsogiannis, C., and McCorriston, S. (2014). Multiple taxes and alternative forms of fdi: evidence from cross-border acquisitions. *International Tax and Public Finance*, pages 1–32.

Hirshleifer, J. (1989). Conflict and rent-seeking success functions: Ratio vs. difference models of relative success. *Public choice*, 63(2):101–112.

Konrad, K. A. and Kovenock, D. (2009). Competition for fdi with vintage investment and agglomeration advantages. *Journal of International Economics*, 79(2):230–237.

Lavers, T. (2012). Patterns of agrarian transformation in ethiopia: State-mediated commercialisation and the land grab. *Journal of Peasant studies*, 39(3-4):795–822.

Lawson-Remer, T. (2014). Security of property rights for whom? *Oxford Development Studies*, 42(3):319–342.

Menguita-Feranil, M. L. (2013). Contradictions of palm oil promotion in the Philippines. In Pye, O. and Battacharya, J., editors, *The Palm Oil Controversy in Southeast Asia: A Transnational Perspective*, pages 97–119. Institute of Southeast Asian Studies.

Pieretti, P. and Zanaj, S. (2011). On tax competition, public goods provision and jurisdictions' size. *Journal of International Economics*, 84(1):124–130.

Putzel, J. (1992). *A captive land: the politics of agrarian reform in the Philippines.* Catholic Institute for International Relations.

Robertson, B. and Pinstrup-Andersen, P. (2010). Global land acquisition: neo-colonialism or development opportunity? *Food Security*, 2(3):271–283.

Skaperdas, S. (1996). Contest success functions. *Economic theory*, 7(2):283–290.

Sonin, K. (2003). Why the rich may favor poor protection of property rights. *Journal of Comparative Economics*, 31(4):715–731.

Sorens, J. and Ruger, W. (2012). Does foreign investment really reduce repression? 1. *International Studies Quarterly*, 56(2):427–436.

Van Long, N. (2013). The theory of contests: a unified model and review of the literature. *European Journal of Political Economy*, 32:161–181.

White, B., Borras Jr, S. M., Hall, R., Scoones, I., and Wolford, W. (2012). The new enclosures: critical perspectives on corporate land deals. *Journal of Peasant Studies*, 39(3-4):619–647.