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**FESTSCHRIFT FOR RAUL V. FABELLA**

Guest Co-editors — **Emmanuel S. de Dios**, **Sarah Lynne S. Daway-Ducanes**

**ARTICLES IN THIS ISSUE**



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# The Philippine Review of Economics

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# The Philippine Review of Economics

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## Festschrift for Raul V. Fabella

This special edition of the *Philippine Review of Economics* honors Dr. Raul V. Fabella in his 70th year and recognizes his invaluable contribution to the economics discipline and profession. This edition comprises 13 articles from his colleagues and several generations of former students inspired or mentored by Dr. Fabella who are themselves making their mark in economics. The broad spectrum of topics covered—agricultural economics, competition policy, contract theory, game theory, history of economic thought, international economics, issues in productivity, growth and development, monetary policy, political economy and rent-seeking, public economics, and the theory of teams—are issues that Dr. Fabella himself has written on or taught his students during his long, productive years as a Professor of Economics at the UP School of Economics, nurturing an "oasis of excellence" in his spheres of influence, as well as advocated as a roving academic in his later years, endeavoring to engage policymakers and the public in general, in pursuit of welfare-improving changes for a better Philippines.

The wide gamut of topics in this issue is a testament to Dr. Fabella's eclectic intellectual interests yet unwavering devotion to upholding a high standard of academic excellence. As his biographical sketch at the National Academy of Science and Technology summarizes:

> Fabella's very development as a scholar and intellectual leader presents numerous paradoxes: a classicist turned mathematical economist; a rational-choice theorist who derives material and metaphor from both history and physics; a solitary thinker who agonizes over pedagogy; a pure theorist immersed in policy-debate; an inherently shy, private man who must deal with crowds. His career displays to the fullest the range of issues – from the mathematical to the moral – that economists can and must confront if they are to attain to that "cool head and warm heart" that was Marshall's ideal. A classicist, however, might simply recall Terentius: *Homo sum: humani nil a me alienum puto*.

Indeed, to Dr. Fabella, nothing related to human behavior is outside his interest. At 70 years of age, National Scientist of the National Academy of Science and Technology (Philippines) and Professor Emeritus at the University of the Philippines, he is yet to reach the zenith of his intellectual verve: Fabella the economist is transfiguring into Fabella the social scientist – one to whom *homo economicus* is no longer the norm, but the exception in the vast complexity of human interactions in society. It is thus unlikely that this will be the last festschrift in his honor.

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# The case against the case for land reform: transaction costs and misplaced exogeneity

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The paper reviews the pros and cons of land reform with particular attention to the Philippines. We find a repeated theme in supporting arguments for land-to-the-tiller reform and the outlawing of share tenancy: that land reform will improve efficiency by lowering transaction costs. We show that this is logically incorrect and fails to draw appropriate lessons from the evidence. More generally, the arguments for land reform suffer from misplaced exogeneity, in particular by implicitly regarding farm size and organizational form as exogenous.

**JEL classification:** O13, R52
**Keywords:** land reform, farm size, inverse relationship, share tenancy

## 1. Introduction

In a series of papers (Fabella [2003], [2009], [2014]), National Scientist and economist Raul Fabella proposed re-examining the three-decade Philippine Comprehensive Agrarian Reform Program (CARP), the world's longest-running land reform program. These papers call for a shift of focus away from a limit on agricultural landholdings of five hectares under the CARP law towards policies that free up land markets that would boost agricultural productivity.

Fabella [2014] in particular argued that the design of the Philippine land reform under CARP was flawed in both design and implementation in ways that reduced efficiency and retarded productivity growth such that the net effect was to retard poverty alleviation, notwithstanding the attempted and actual land transfer to beneficiaries. In what follows, we suggest that the reason that the Philippine program failed in practice was because it rested on unwarranted inferences from evidence and flawed theory.

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The objective of this paper is to review the pros and cons of land reform with particular attention to the Philippines. We find a repeated theme in supporting arguments for land-to-the-tiller reform and the outlawing of share tenancy: that land reform will improve efficiency by lowering transaction costs. We show that this is logically incorrect and fails to draw appropriate lessons from the evidence. More generally, the arguments for land reform suffer from misplaced exogeneity, in particular by implicitly regarding farm size and organizational form as exogenous.

The land reform controversy stems from the oldest debate in the economics of agricultural development regarding the extent to which traditional agriculture is inefficient. Before the Schultzian revolution, traditional agriculture was thought to be both behaviorally and organizationally inefficient. Schultz [1964] largely discredited the behavioral-inefficiency thesis and summarized his findings with the slogan that farmers in traditional agriculture are "efficient but poor".[1] This left the thesis that traditional agriculture may be organizationally inefficient, due to various "market imperfections". The case for land reform grew out of this view.

Much of the early economics literature advocating land reform focused on the "inefficiency of inequality" [Lipton 1979], in particular the apparent inefficiency of the skewed distribution of agricultural land ownership (e.g. Sen [1962], Berry and Cline [1979], Johnston and Kilby [1975]). As early models of this inefficiency were discarded, new models rose to take their place. Much of the remaining controversy surrounds the question of whether the inverse relationship between farm size and agricultural productivity signifies inefficiency and, if so, whether land-to-the-tiller reform is a suitable remedy.

The second efficiency plank of land reform advocacy regards the possible inefficiency of share tenancy. The centerpiece of this view stems from the canonical Stiglitz theory of share tenancy: whereby share tenancy is a pairwise-efficient mechanism between landlord and tenant, it leaves the tenant with a Marshallian incentive to stint labor and disenfranchising landlords can remove that inefficiency.

Another goal of land reform is to reduce poverty by converting tenants and landless workers into owner-operators. Some have even suggested that land reform is a necessary condition for economic development and industrialization through its output enhancing and redistribution effects (Lipton [2009]; Borras [2007]; Studwell [2013]). These claims need conceptual and empirical review.

In addition to efficiency and equity objectives, land reform is also said to reduce social conflict and improve governance (e.g. by reducing rent-seeking by the commercial elite). Whether this goal has been realized in practice is subject to debate. From a historical (positive instead of normative) perspective, land reform is sometimes used as a tool to strengthen the ruling elite and weaken potential opponents (Tuma [1965]; LaCroix [2014]).

[1] More recently, farmers are said to be only "boundedly" rational, such that "nudges" from government policy, e.g. free delivery of fertilizer purchases, may lead to income gains greater than said delivery cost [Duflo, Kremer, and Robinson 2011].

The case for land reform based on reducing transaction costs is reviewed in Parts 1 and 2, including a discussion of empirical work resting on misplaced exogeneity. Part 3 discusses some of the equity and welfare issues. Part 4 discusses the political economy of land reform, and Part 5 concludes.

### *1.1. The pros and cons of land-to-the-tiller reform*

Involuntary land-to-the-tiller reform is based on the proposition that large farms are less efficient than small farms, based largely on the inverse correlation between farm size and yield-per-hectare. The following discussion reviews the theory and evidence behind that claim.

In early accounts, the inverse relationship was documented for India and explained by the assumption that the wage in the modern (commercial) agricultural sector was exogenously set by "institutional" factors in excess of the marginal product of labor in traditional agriculture, implying a lower marginal product and a higher intensity of cultivation (Sen [1962], [1966]; Mazumdar [1965]; Berry and Cline [1979]). Neither evidence nor fundamental reason was given for the difference in implicit wages and marginal products in the two sectors. The apparent inefficiency is only true by assumption.

The most popular current explanation of the inverse relationship is that large farms are said to be at a transaction cost disadvantage with respect to labor [Otsuka 2007]. The shadow price of hired labor is assumed to be higher than that of family labor because of transaction costs relating to hiring, training and supervision, and the transaction cost wedge is assumed to be a source of inefficiency (Stiglitz [1974]; Feder [1985]; Binswanger et al. [1995]; Lipton [2009]). The existence of the inverse relationship is then used as evidence supporting the theory.

The problem with this logic is that other explanations have been provided for the inverse relationship that do not imply inefficiency. In the first-best theory of contracts, family-farm size is adjusted across different land qualities to equate the marginal product of labor, given family size [James and Roumasset 1979]. While the inverse relationship was found to be highly significant for a sample of family farms in Laguna, once even crude proxies for land quality were included in the analysis, the significance of farm size disappeared, suggesting that the relationship is the result of spurious correlation due to *omitted-variables bias* [Roumasset 1976]. Lower quality land is also typically employed in the production of lower valued crops or for pasture (Bhalla and Roy [1988]; Verma and Bromley [1987]; Newell, Pandya and Symons [1997]) that are land intensive and require little labor per hectare, thus, contributing an inverse relationship when all crops are lumped together.

Another efficiency-based theory regards farmer skills. Assuncao and Ghatak [2003] show that high-skilled peasants will self-select to crop small farms in a model with heterogeneity of farmer skills, credit-market imperfections, constant returns to scale and no labor-market imperfections once the opportunity costs of different skill levels are considered. Assuncao and Braido [2007] find, however,

that household-specific characteristics (e.g. skill/management quality) are not significantly related to output per hectare. Nonetheless, diverse skills may be a small contributing factor.

Other studies have, however, found that while including proxies for land quality reduces the strength of the inverse relationship, its significance remains (e.g. Burgess [2001] for China; Barrett et al. [2010], Lipton [2009:70]). The World Bank [2009] concludes that the relationship persists for Philippine rice and corn farms in the presence of controls (but not for sugar farms). Of particular interest are studies that include improved measures of land quality such as land value [Deininger 2003] or a more complete list of land quality proxies and still find that the inverse relationship is significant. For example, Ali and Deininger [2014] include slope, soil quality, distance from homestead, presence of irrigation, and time of plot possession and find that shadow-profit per hectare is still inversely related to farm size in the presence of said proxies.

Lipton [2009] concludes that: "Missing variables do not explain away the IR", that "the evidence shows that the [inverse relationship] is not a bogus statistical artefact of missing variables", and that therefore, small farms have advantages that are not caused by smallness itself [Lipton 2009]. Lipton [2009: 111] accordingly argues that the case for public intervention such as land reform is more forceful to the extent that the following conditions are present:

1. a strong inverse relationship
2. a larger share of land in farms above optimum size
3. a slower convergence between existing actual and optimum size
4. a high agricultural share in national output and employment
5. farm size inequality being associated with other "inefficiencies" such as higher transaction costs due to a greater proportion of hired labor.

One problem with this analysis is that several locational factors contribute to land quality (e.g. irrigation, soil characteristics, weather, topography, pests, market access, and local prices) and many of these variables are not available for statistical analysis.[2] Simply including a list of partial proxies for land quality does not eliminate omitted variable bias, especially if the unobserved heterogeneity are also affected by these proxy variables. Nor do regression coefficients reflect the weights that these components would contribute to a proper index of potential rent. Since farm size is endogenous, simply regressing yield per hectare on farm size in the presence of "control variables" does not eliminate the bias. In contrast, Benjamin [1995] eliminates the endogeneity problem by using an instrumental variable for farm size (based on demographic variables) and finds that the significance of the inverse relationship disappears.

[2] Since the beginning of location theory [Thünen 1926], it has been known that things such as transport costs can affect crop choice. It is odd then that modern scholars often use soil characteristics to proxy for land quality given the importance of other factors. One could easily extend the Thünen (concentric circle) model to get a theory of farm size location. Since the high-valued crops located nearer to the city center are more labor-intensive, family-farm sizes would be correspondingly smaller.

The counterargument to Benjamin's finding is that the weaker the instrument, the greater the standard error in the estimated coefficient of farm size, leading to the loss of significance. In other words, neither statistical approach is entirely satisfactory. The control variable approach leaves (downward) omitted variable bias and the instrumental variable approach is likely to leave sizeable standard errors, especially if the instruments are weak.

A more direct procedure for investigating the relationship between efficiency and farm size might be to compute inefficiency per hectare as potential profit per hectare minus actual profit per hectare and then to ask whether inefficiency is significantly related to farm size.[3] Due to data limitations and the problems with obtaining production functions in heterogeneous conditions, this procedure has not yet been implemented. Moreover, we would still be left with the problem that farm size is endogenous.

A more appropriate procedure would be to construct a theory of farm size. Indeed, Lipton [2009] underscores the success of land reform resting partially on there being a large share of land operated at above optimally sized holdings. Lacking a theory of optimum farm size, however, one cannot conclude that the inverse relationship is *prima facie* evidence of inefficiency. The elements of such a theory, including an allowance for transaction costs, are discussed in the following subsection.

### *1.1.1. A second-best theory of farm size and labor allocation*

Both second-best optima and second-best equilibria are characterized by heterogeneous shadow prices across economic agents and across both factors and goods (e.g. Dixit [1998]). Consider a land market where initial entitlements are largely determined by inheritance. Given transaction costs, markets will not equalize shadow prices of land and labor across farms. Those with more land will face lower shadow prices of land and, because of more hired labor, higher shadow prices of labor. As in Sah [1986], these factors combine to imply greater labor per hectare and an inverse relationship between farm size and yield per hectare. Yet, no inefficiency is implied by this scenario.[4] Small farms have greater land productivity and large farms have greater labor productivity.

For example, assume that establishing a farm incurs a fixed cost and that the marginal cost of other inputs is rising. In this simple model, the optimal farm size varies according to the heterogeneous fixed-cost and the heterogenous nature of the marginal cost function, depending as it does on the labor force of the farm family and their off-farm opportunities, the transaction costs involved in hired labor, and heterogeneous prices and transportation costs of other inputs. Further heterogeneity would be introduced by allowing for differences in land

[3] For a discussion of potential profits, inefficiency and estimates for the Philippines, see DeSilva [2000].

[4] This exercise can be extended to include mechanical equipment following Eswaran and Kotwal [1986]. Absent economies-of-scale, labor-substituting equipment simply flattens the supply curve of farm tasks (from land preparation to harvesting and threshing). Aside from quality differences, larger farms still pay a higher marginal cost for those tasks and therefore farm less intensively, implying a lower yield per hectare.

characteristics and farming abilities. Once we calculate the optimal family-farm size for a particular combination of factors, we would then have to compare its optimal expected rent with that of other organizational forms, e.g. a more commercialized operation. Clearly, all of these factors contribute to a wide diversity in both optimal farm sizes and organizational forms.

The theory gets even more complex if we allow for factors contributing to the comparative advantage in land ownership. Landowners are the entrepreneurs of agriculture, specializing in choosing the farm enterprise, contracting with managers and workers of various types, and investing in land improvements, including the avoidance of land-shirking (Roumasset and Uy [1987]; Roumasset [1995]; Allen and Lueck [2002]). The ability and willingness to undertake these functions vary widely. This additional heterogeneity renders the optimal structure of agriculture even more complex and diverse. To the extent that particular parameterizations of such theories can explain stylized facts such as the inverse relationship, inefficiency explanations of those patterns are undermined.

In effect, top-down land reform programs overlook these fundamental reasons for diversity. Instead of a *one-size-fits-all*, efficiency requires many sizes for many prices, crops, land types, skill sets, and transaction costs.

To the extent that a second-best structure was in place, the government could only increase agricultural incomes by implicitly arbitraging across divergent shadow prices, i.e. doing what land markets would have done, were land transfers less costly. The government would need to be omniscient to the extent that it could foresee what those transfers would be and omnipotent enough to be able to effect transfers at lower cost than the market. The implication is that top-down transfers along with restrictions on transferability are likely to impede the appropriate goal of development policy – to facilitate mutually beneficial exchange across divergent shadow prices and to shrink the shadow price wedges by physical and legal infrastructures that decrease unit transaction costs.

Just as the defunct structure-conduct-performance paradigm [Bain 1959] ignored the reasons for diverse market structures [Demsetz 1973], so does the farm size debate ignore the endogeneity of farm size and the reasons for its tremendous diversity. Indeed, unequal land distributions reflect different land characteristics, diverse preferences, tax laws, prospects for internal and external economies of scale, and differences in wealth and differences in investment opportunities.

Transaction costs imply that shadow prices are different for different farms, implying different levels of mechanization and different optimal farm sizes. Even aside from transaction costs, efficient matching of heterogeneous land to heterogeneous farmer skill sets means that yield per hectare need not have a neutral relationship to farm size. That is, even if the inverse relationship were to persist after correctly dealing with the endogeneity problem regarding farm size, that would not signify inefficiency.

### *1.2. Agency costs and market structure issues*

A more general statement of the transaction-cost-disadvantage thesis is that if rich people hold the land and poor people do the work, then agency costs are unnecessarily created in connecting workers and land. The corresponding model assumes homogeneous land and labor and an unproductive rentier class (e.g. Stiglitz [1974]). For heterogenous land and labor and landlords that contribute to management, however, a complex incentive structure is needed to match diverse land, labor, and management assets and to motivate them for the least efficiency loss [Roumasset 1995].

A fear that relates to the vision of rich landlords and poor peasants is that either by virtue of the size of individual holdings or through collusion, landlords will exert monopsonistic power. The check on that potential power is the mobility of farmers and workers. There were anecdotal accounts of large landowners in Tarlac with their own private armies chasing after tenants who tried to escape to Manila during the Magsaysay and (Diosdado) Macapagal presidential years. But those accounts represent the failure of the rule of law to control the restraint of competition and trade.

### *1.3. Other problems with the small-is-beautiful thesis*

#### *1.3.1. Specialization*

Even small farms in low-wage Asian economies hire labor at the margin, especially for arduous tasks that are easier to supervise by inspection of the outcome of work, e.g. weeding, transplanting and harvesting (Roumasset and Uy [1980]; Roumasset and Smith [1981]; Hayami and Kikuchi [1982]). Hired labor thus facilitates specialization by task according to comparative advantage and begets greater learning-by-doing. As described in these accounts, for example, rice transplanted by teams resulted in much straighter stalks compared to that by family labor thereby facilitating better weeding. In other words, hired and family labor are not perfect substitutes.

Any “transaction cost disadvantage” that large farms face in hiring labor may therefore be offset by benefits of specialization. Agency costs rise with specialization as a fraction of total production costs [Roumasset and Lee 2007]. Accordingly, judging efficiency by the extent of agency costs is tantamount to looking at the costs without considering the benefits that those agency costs afford. Higher agency costs may simply be a necessary cost to get higher quality labor for the performance of many varied tasks.

### *1.3.2. Transaction cost advantages of large farms*

The abstract wedge model (Roumasset and Smith [1981]; de Janvry et al. [1991]) that underlies the transaction cost disadvantage argument assumes that unit transaction costs are constant. However, the transaction costs of hired labor, including recruiting, training, and negotiating costs are subject to economies of scale. This may put small farms that hire labor at a transaction cost disadvantage instead of the other way around. Large farms also have transaction cost advantages in credit and marketing, e.g. the vertical coordination that characterizes the supermarket revolution. These may compensate for, or even dominate, any disadvantages. Agricultural productivity growth is also expected to be greater in vertically coordinated enterprises, again favoring larger farms [Reardon and Timmer 2007].

### *1.3.3. Small is not perpetually beautiful.*

Even if farm sizes were optimally small at one stage of development, conditions may change. In the course of economic development, real wages rise relative to land rents and the cost of farm equipment. This induces an efficient substitution of capital for labor and an increase in optimal farm size associated with the scale economies of farm mechanization (Day [1967]; Otsuka and Estudillo [2010]; Otsuka [2012]; Foster and Rosenzweig [2017]). Increases in the transaction cost advantages associated with credit and marketing (such as the *supermarket revolution*) and on-farm specialization will also increase optimal farm size.

### *1.3.4. The inverse relationship as a sampling problem*

Uy [1979] sampled sugar farms in Laguna and Negros provinces of the Philippines and found an inverse relationship for family farms but a positive relationship between yield per hectare and farm size on commercial farms. This suggests that the pervasive inverse relationship cited previously may reflect a sampling problem. Since there are only a few substantial commercial farms, they will tend to be swamped in regression analysis. Accordingly, Foster and Rosenzweig [2017] analysed an equal number of small, medium, and large farms in India and found a U-shaped relationship instead. The inverse relationship holds for small farms, but for large farms economies of scale tend to dominate.[5] The low productivity of intermediate-sized farms derives from the higher labor costs but without sufficient size to exploit economies of mechanization.

[5] Feder [1985] anticipated this result, showing how the inverse relationship may prevail as supervision costs rise with farm size but may be dominated at larger farm sizes by falling costs of credit.

Relatedly, farm size has been increasing in developed countries but still falling in most developing countries, although the latter tendency has been largely offset in more rapidly developing countries such as Indonesia and Thailand that have experienced substantial increases in real wages [Hazell et al. 2010].[6] The same theory that explains the U-shaped pattern in a cross-section within countries can also explain the transition from falling to rising farm sizes as part of a country's structural transformation. The theory predicts an especially strong trend towards rising farm size for crops such as rice, where land-saving technical change has augmented the effect of rising real wages [Moya et al. 2015]. Unimpeded, this transition brings ever increasing productivity in agriculture along with the linkages that these contribute to manufacturing growth.

To the extent that artificial constraints on land ownership and farm organization restrict the efficient transition to larger farm sizes, structural transformation will be impeded including productivity growth in both the agricultural and manufacturing sectors and the wage increases that they bring.

## 2. The pros and cons of outlawing share tenancy

Another fallacy of land reform reasoning results from the assumption that share tenancy is inherently inefficient so that outlawing such tenancy, especially in combination with land-to-the-tiller reform, will increase agricultural productivity. This claim dates back to the Marshallian model (e.g., as described in Cheung [1969]), wherein the rational tenant equates his marginal opportunity cost of labor with his share of the marginal product and accordingly stints labor relative to the efficient solution.

This theory has been discredited, however, on the grounds that the Marshallian solution "leaves money on the table" and cannot be a contractual equilibrium. The landlord has a number of devices to guard against shirking, in particular the threat of eviction (Johnson [1950]; Cheung [1969]).[7] Under the assumption of full enforceability, the landlord can contract with the tenant to provide the efficient quantity of labor and set the share such that the tenant receives a competitive wage (Cheung [1969]; Newbery [1977]; Otsuka [2007]). Under perfect certainty and absent transaction costs, competitive share contracting is equivalent to a competitive rental market and to a competitive labor market. This first-best theory is accordingly useful for explaining the terms of share contracts, although second-best theory is needed to compare whether wage, rent, or share contracts minimize agency costs in particular situations (e.g. Roumasset [1995]; Allen and Lueck [2002]).

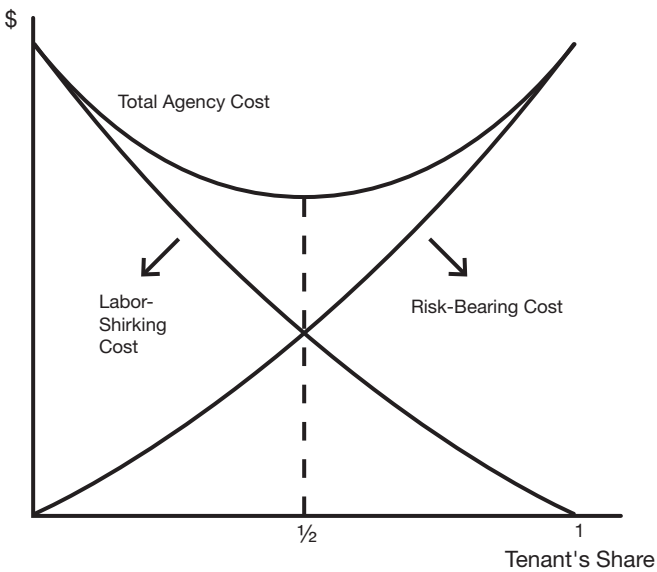
[6] In fact, the average farm size of rice farms in Thailand has increased during the last decade (IRRI board member, Suthad Setboongsarng, personal correspondence).

[7] In general, repeated contracting reduces incentive problems [Rubinstein 1979].

### *2.1. The risk-bearing theory*

In its canonical risk-bearing model (Stiglitz [1974]; Hayami and Otsuka [1993]; Singh [2000]), share tenancy emerges as a possible way to substantially reduce the disadvantages of both rent and wage contracts. Rent contracts eliminate the agency costs associated with labor shirking by rewarding the worker with the full residual of labor effort. The lessees, however, bear all the risk, resulting in a misallocation of risk-bearing, presuming the tenant is more risk-averse than the landlord. A generalized version of the theory is illustrated in Figure 1.

**FIGURE 1. A generalized risk-bearing theory of share tenancy**




First, note that under uncertainty, the landlord cannot infer effort by observing yield, and output sharing alone is insufficient to incentivize an efficient labor input. The resultant labor-shirking can be reduced however by supervision. The agency cost of labor shirking is the minimized sum of (imperfect) supervision costs and losses from the labor shirking that remains [Jensen and Meckling 1976]. As the tenant's share increases from zero to one, these labor shirking costs fall to zero. The convex shape of the curve is due to the fact that it is increasingly costly to reduce shirking as more and more of the shirking has already been eliminated.[8]

[8] Stiglitz's [1974] original version of the risk-seeking model and the reviews of same by Hayami and Otsuka [1993] and Singh [2000] do not allow for governance of labor-shirking (e.g. supervision). The version here is a generalization that includes endogenous governance (see e.g. Roumasset and Uy [1980; 1987] for further details).

Risk-bearing costs for each agent are given by the risk premium, i.e. the difference between expected net income and the certainty equivalent. Assuming a risk-neutral landlord and a risk-averse tenant, risk-bearing costs increase with tenant's share as shown. The sum of the two curves is the total agency cost of the contract. The optimal share is where total agency cost is minimized. In the (unlikely) event that the two sub-cost curves are symmetrical as shown, the optimal share turns out to be 50 percent, the most common share observed.

Stiglitz ([1974]; [1994]) concludes that share tenancy is thus a pairwise efficient mechanism for mediating risk bearing and labor shirking. Nonetheless, he notes that it is socially inefficient because it leaves the tenant with what is tantamount to a 50 percent income tax (for the case of 50:50 sharing), and that effort disincentive could be removed by land-to-the-tiller reform.[9] In a series of articles, Hayami and Otsuka [1993:51] (hereafter H-O) conclude that the risk-aversion-vs.-moral-hazard model "justifies the existence of share tenancy in the theoretically most consistent matter". Nonetheless, they conclude that share tenancy is relatively efficient. This is something of a mystery inasmuch as Stiglitz comes to a dramatically different policy conclusion from the same model.

### *2.2. Unravelling the mystery: Stiglitz and H-O reconciled*

Stiglitz's conclusion is based on the theoretical implications of his model. The sizeable agency costs of share tenancy that his model implies could be hypothetically eliminated by land-to-the-tiller reform, assuming (erroneously) that no labor will be hired.

The H-O conclusion that share tenancy is relatively efficient is based on both conceptual and empirical arguments. Conceptually, share tenancy serves several functions beyond connecting labor to land as in Stiglitz [1974]. First, it provides a mechanism for land-poor farmers to transact with land-abundant landlords (as do rent and wage contracts). Second, it partially substitutes for insurance by sharing output, which shares revenue risk between landowner and tenant. Third, share tenancy provides a mechanism for providing production credit where the landlord's shadow price of credit is substantially lower than the tenant's.[10] Fourth, share tenancy provides incentives for both landlord and tenant to contribute management expertise. Share tenancy is also often a vehicle for more educated and wealthy landlords to assist tenants with emergencies and consumption shocks. Inasmuch as share tenancy serves these functions, Otsuka [2007] concludes that share tenancy can be efficiency enhancing.[11]

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[9] "With workers having to surrender 50 percent or more of their income to landlords, surely (if conventional economics was correct), incentives were greatly attenuated…But if workers owned their own land, then they would not face what amounted to a 50 percent tax" [Stiglitz 2001:473].

[10] Before land reform, landlords in Laguna, for example, typically advanced credit (in cash or kind) for seeds and fertilizer, the cost of which would be deducted before dividing the harvest according to the established shares. This is the "supportive" form of share tenancy described in Roumasset [1976].

[11] Roumasset and Smith [1981] and Otsuka [2007] also note that tenancy contracts, including share tenancy, are conducive to social justice by providing opportunities for advancement up the agricultural ladder.

Moreover, empirical evidence suggests that share tenancy is not less efficient than other possible contracts. Regarding empirical evidence, Hayami and Otsuka [1993] undertake a meta-analysis of yields from different case studies and find that yields under share tenancy are statistically indistinguishable from owner farming or fixed-rent tenancy.[12] They conclude that their results "do not support the hypothesis that Marshallian inefficiency prevails under share tenancy" [1993:92]. In other words, they accept Stiglitz's theory but not his policy implications. In order to further unravel the mystery, we will first review the leading theories of share tenancy and corresponding empirical studies to see whether the H-O conclusion about the superiority of the risk-bearing theory is warranted. We will then explain how Stiglitz and H-O derive polar policy implications from the same theory.

### *2.2.1. Theories rejected by H-O*

There are a number of theories that explain the existence of share tenancy without invoking risk aversion.

#### *2.2.1.1. Selection models*

Hallagan [1978] adapted Salop's [1976] self-selection model to agricultural contracting and showed that share tenancy can arise as part of a menu of contracts that landlords offer in the absence of information on workers' abilities. In his model, high, medium, and low-skilled workers will self-select into rent, share, and wage contracts respectively. H-O [1993], based on Allen [1982], reject the Hallagan model on the grounds that it does not incorporate the maximizing behavior of the landlord, apparently without considering improvements in the self-selection model. In particular, Allen [1985] provided a model that includes the landlord's maximization as well as the possibility of the tenant defaulting on the payment to the landlord. The menu of contracts is designed such that farms are small enough to prevent low-ability workers from becoming tenants and that tenants do not default on their loans. The result is that high-ability tenants self-select into rent contracts, those of middle ability choose share contracts. Allen argues that self-selection can be preserved when the model is extended to include uncertainty.

H-O reject Allen's [1985] model on the grounds that both share and fixed-rent tenancy can achieve the same allocation, i.e. there is no positive reason for share tenancy and lease contracts to co-exist. That is, the allocation under a share contract can be replicated with a rent contract by simply lowering the amount of land offered. The result will be that medium-ability workers are indifferent between taking a rent contract and earning their opportunity wage elsewhere while high ability workers earn surplus (see H-O:44). However, this is a rather

[12] Available data in these studies typically did not allow researchers to distinguish between owner-managed farms that hire a large proportion of labor and owner operated farms wherein relatively little labor is hired.

weak criticism. Minor factors outside of the model could determine a landlord's preference for share or rent contracts, while the menu approach could still be a useful way to match contracts with abilities. However, H-O also note that another problem with the selection theory is its reliance on the assumption that fixed-rent tenants pay after the harvest, whereas real-world tenants typically "pay-to-play", i.e. before cultivation begins.

Also, as noted by Eswaran-Kotwal [1985:352], "the assumption of ignorance on the part of landlords about tenants' abilities is quite inappropriate for most rural communities." Another criticism of the selection model is its omission of managerial roles of landlord and tenant as portrayed, e.g., in Reid [1979], Murrel [1983], Roumasset and Uy [1987] and Roumasset [1995]. Indeed, the appeal of rent contracts is partially that tenants are motivated to take care of production management. Thus, a screening mechanism is needed to select capable managers. On the other hand, landlords sometimes take a more active managerial role, e.g. with sharecroppers in the Post-Bellum South (e.g. Reid [1979]). The landlord's managerial role is highlighted in the following model.

#### *2.2.1.2. Two-sided shirking*

Eswaran and Kotwal [1985] (EK) assume that the landlord has a comparative advantage in production management and the tenant provides effective labor, which is a function of labor hours and supervision. Both inputs are subject to shirking. EK characterize the interaction of the landlord and tenant as a one-shot non-cooperative game. The agents form reaction functions dependent on each other's provision. The authors then identify combinations of parameters such that the Nash equilibrium contract is rent, wage, or share. For example, if landlords have a strong absolute advantage in production management and if the agency costs of labor shirking are not high, then they will choose wage contracts. The opposite configuration favors rent contracts. Share contracts are preferred with intermediate values of these parameters.

H-O reject the Eswaran and Kotwal model by suggesting that the short-run disadvantage of rent contracts – that landlords shirk management – would be mediated in the long run inasmuch as landlords know that tenants would not renew. However, this assertion is not proven either conceptually or empirically. The possibility of improved governance via long-term relationships simply lowers shirking costs; it does not eliminate them. Nonetheless, one might expect that a longer-run version of the EK model would predict a higher incidence of rent contracts than is typically observed. This is suggestive of the need to articulate additional disadvantages of fixed rent arrangements, as in the following section.

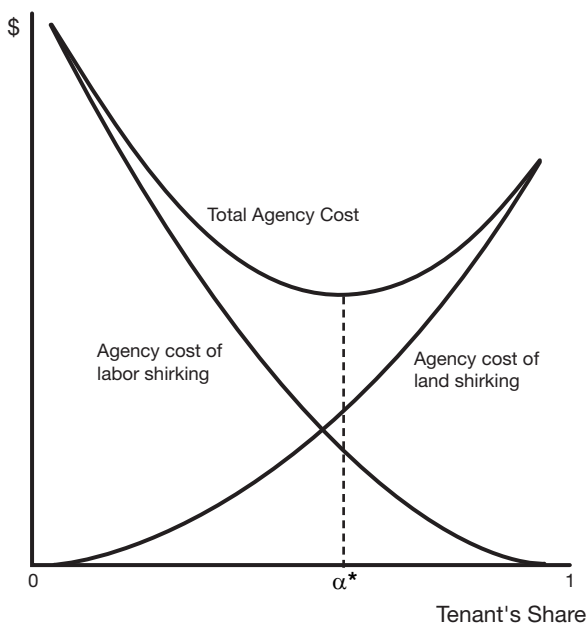
The most telling critique of the EK model is simply that share tenants in Asian agriculture (and in 20$^{th}$-century US) are experienced farmers and do most of the production management themselves. This feature is also built into the model in the following section.

*2.2.1.3. Agency theory with double shirking*

As explained further below, the cost of risk-bearing is likely to be too small (and possibly of the wrong sign) to offset potential shirking problems. A theory that has a chance to explain empirical patterns of tenure choice must contain an additional disadvantage of rent contracts. This is provided by the possibility of "land shirking" or "asset abuse". A farmer on a fixed lease contract "overutilizes any inputs supplied by the landowner". In particular, the farmer may till, cultivate, and accelerate crop rotation in ways that increase current output but degrade the land [Allen and Lueck 1992:401]. Inasmuch as share contracts are typically repeated for several seasons, barring bad behavior, the share tenant is less inclined to abuse the land.

Datta, et al. [1986], Roumasset and Uy [1987], Roumasset [1995] and Allen and Lueck ([1992], [1998]) provide closely-related agency models of share tenancy that balance the costs of labor shirking against those of asset shirking (especially land shirking). As shown in Figure 2 below, the share is determined where the sum of the agency costs of labor and land shirking is minimized.

**FIGURE 2. Double shirking theory of share tenancy (diagram adapted from Hayami and Otsuka [1993])**




As before, the agency cost of labor shirking is the minimized sum of expenditures to decrease shirking (e.g. supervision) and the labor shirking that still prevails in the presence of such expenditures. For higher and higher tenant shares, this cost declines (to zero for rent contracts). The agency cost of land shirking is

the analogous construct for asset abuse. For example, the landlord may insert side conditions into the contract to limit abuse that require her to monitor performance and impose penalties for subpar performance. These costs are negligible for wage contracts and increase with the tenant's share. The optimal tenant share occurs where total agency cost is minimized. This theory provides an efficiency basis for share tenancy, without the contrivance of risk aversion. Moreover, Allen and Lueck ([1998]; [2002]) show that this theory explains the incidence of rent vs. share tenancy in the Midwestern US (Nebraska and South Dakota).

Allen and Lueck [2002] also undertook several empirical tests to justify the assumption of risk neutrality in the double-shirking model by adding variables on farm income variability, yield of crop with different variability and the coefficient of variation of the county-crop yield. The authors conclude that "these tests suggest that risk-sharing is not useful in explaining contract choice" [Allen and Lueck 2002:419].[13]

Nonetheless, H-O [1993:45] reject this class of models since it "applies only to the situation in which the tenancy contract is made for a short period during which the effect of land management is not so evident". This rejection represents a fundamental misunderstanding of the nature of economic methodology, however. Assumptions that abstract from reality (e.g. profit and utility maximization) are not meant to be true but to be useful in understanding key relationships in isolation from the noise that otherwise may obscure them (Friedman [1966]; Roumasset [2014]). The fact that real-world tenancy contracts last for more than one period does not mean that the abstract theory has no place in understanding agricultural contracts. Indeed, the possibility of contract renewal mitigates asset shirking to the extent that tenants seek to avoid dismissal and the possibility of earning a bad reputation. But by the same token, governance possibilities over multiple periods would lessen labor shirking as well. That is, the effect of multiple periods is not to repudiate the double-shirking theory but to shift down the curves of Figure 2. With lower agency costs, the chances that share tenancy can emerge as an optimal contract are in fact increased when multiple periods are considered.

We may now reconcile the apparent contradiction between Stiglitz ([1974]; [1994]; [2001]) and Hayami-Otsuka [1993]. Stiglitz believes that the risk-bearing theory is correct and implies inefficiency tantamount to a 50 percent income tax. H-O believe the same theory is correct but that share tenancy is efficient. First, Stiglitz exaggerates the disincentive effect of a 50 percent share tenancy contract.[14] As shown in the generalized version of the risk-bearing theory seen in Figure 1, governance mechanisms such as monitoring are available to reduce

[13] Strictly speaking, this conclusion does not imply risk neutrality – only risk aversion is at best a very minor factor in the choice of agricultural contracts in the US Midwest.

[14] Implicitly relying on the same assumptions, Hoff [2001] notes that "with imperfect capital markets, the poor may be unable to enter into labor and land rental contracts that provide strong incentives for effort (for example, they may be sharecroppers instead of renters, and entrepreneurial activities may be foreclosed)". See also Hoff [1994].

tenant shirking, even in a single period. As verbally described by H-O, these agency costs will fall even further in a repeated-game setting (illustrated by downward arrows in Figure 1).[15] Moreover, even exogenous monitoring would lower shirking incentives.

But while Stiglitz exaggerates its inefficiency, H-O and Ostuka [2007] do not really show conclusively that share tenancy is efficient as they claim. Stiglitz's ([1974]; [1994]) case against share tenancy, rests ultimately on the Greenwald-Stiglitz (GS) theorem reviewed in Stiglitz [1994]. If government could costlessly transfer land from landlords to share tenants, the argument goes, there would be no need for the agency costs associated with labor shirking. And Stiglitz implicitly assumes that the remaining risk-bearing costs would be minimal due to the former tenant's increased wealth. While H-O do not explicitly engage the logic of the GS theorem, their implicit reasoning is that the agency costs of share tenancy are already low as argued in the preceding paragraph, and when share tenancy is chosen voluntarily, it is the least-cost institution, such that banning it would decrease efficiency.

While they are thus opposed to banning share tenancy, H-O and their co-authors (e.g. Hayami et al. [1990]) seem to support the idea of land to the tiller reform for reasons similar to Stiglitz, i.e. that land reform removes the transaction cost disadvantage of large farms. As discussed below, however, decreasing agency costs by fiat is likely to decrease efficiency by lowering specialization (far) below the optimum.

### *2.3. Critique of the risk-bearing theory*

Despite its support by Stiglitz and H-O there are reasons for being sceptical about the conceptual soundness and its empirical relevance of the risk-bearing theory. First, the theory rests on the proposition that, for a risk-neutral landowner, the optimal tenant share is decreasing in the tenant's degree of risk aversion. As it turns out, however, the proof of that proposition is incomplete.[16] As shown in Deweaver and Roumasset [2002], an increase in the tenant's risk aversion has a direct and an indirect effect on the optimal share. The direct (or Stiglitz) effect is that a lower tenant share implies a lower cost of risk-bearing, ceteris paribus. But as always, ceteris is not paribus. The indirect effect regards the effect of greater risk aversion on tenant effort. With multiplicative risk (as assumed in Stiglitz [1974]), greater effort shifts the entire yield distribution to the right and reduces risk-bearing cost, such that increasing risk aversion above slight to moderate levels induces greater effort.

[15] The costs of risk-bearing similarly decrease in a multiple period setting as the farm avails of coping methods to smooth consumption (Wickramasinghe [1995]; Townsend 1994]).

[16] See the discussion in Deweaver and Roumasset [2002] regarding proposition 11 in Stiglitz [1974].

Combining the direct and indirect effects implies that greater tenant risk aversion has an ambiguous effect on the optimal tenant share. However, when Deweaver and Roumasset [2002] simulate optimal tenant share using Philippine parameters, they find that the direct effect dominates at low values of risk aversion but that the indirect effect is larger for moderate and high values of risk aversion. The result is that optimal tenant share decreases from 1 to 80 percent as risk aversion goes from zero to low values but then increases back to 1 again as risk aversion increases further. That is, even the extended risk-aversion theory is completely at odds with observed tenant shares, which cluster around 1/2 and 2/3. In other words, the theory exaggerates the advantages of rent contracts. In order to explain observed tenant shares, the theory must be replaced, or at least combined with a theory that includes at least one additional disadvantage of rent contracts.[17]

The risk-aversion model presumes that landlords have a comparative advantage in risk-bearing due to their being wealthier than tenants and because risk aversion is inversely correlated with wealth. Neither assumption is empirically supported. For example, Singh [2009] reports that 47 percent of share tenancy contracts in ICRISAT villages involve partners of roughly equal wealth (same farm size category) and 32 percent involved small farmers leasing to larger farmers. In only 22 percent of the cases did large landowners lease-out their land to small and medium size farmers. Similarly, Bellemare [2007] finds that reverse tenancy, where the farmer is wealthier than the landlord, is on the rise in Punjab, Haryana and West Bengal. Singh [2000] likewise notes that share tenants are sometimes poor and sometimes prosperous. And Allen and Lueck ([1992]; [2002]), after noting a similar diversity in the Midwestern US, explain that some landowners rent-in to obtain a more economically-sized operational unit and some landowners rent-out for the same reason. Regarding the presumed inverse relationship between wealth and risk aversion, Binswanger's [1980] classic study finds only slight and statistically insignificant relationship.

[17] Singh [2000] has resurrected the theory that tenant risk aversion and optimal share are inversely related but in an entirely different model. Based on the model of Hart and Holmstrom [1987], production and effort are a dynamic process where both landlord and tenant can monitor the stages of growth of the crop from beginning to end. Production is a random process but the tenant can adjust his effort based on his observation of crop growth in the entire growth process. The assumption that the tenants can adjust effort during the entire growth path restricts the optimal contract to be a linear function of output by limiting the type of contracts that the landlord can offer. Under some assumptions on the functional form of effort cost (for instance, effort cost is $\frac{L^2}{2}$), the optimal tenant share decreases as risk aversion increases. It is unclear, however, whether Singh's adaptation of Hart and Holmstrom's model distinguishes two opposing effects of inherent risk (e.g. variance of a multiplicative error term) on effort. On the one hand, adverse events that limit crop growth mean that less labor is warranted for subsequent tasks such as weeding and harvesting. On the other hand, adverse events increase the marginal benefits of efforts that shift the distribution of returns to the right.

### *2.4. Other advantages of share tenancy*

As Otsuka [2007] reviews, share tenancy serves several additional functions than have already been covered by the models described above. One of the advantages of a share tenancy contract is it incentivizes the direct provision of production credit and other cost sharing arrangements. Bardhan [1980] observes that contracts between landlords and tenants are characterized by several simultaneous interlinked transactions involving land renting, hiring of wage labor, production and consumption credit, and output marketing. In the Philippines and elsewhere the mechanism for credit provision was that the landlord would advance funds for purchased inputs excluding hired labor [Roumasset 1976]. Bardhan also warns that these functions may be lost under land reform such that any potential productivity gains are offset or dominated by losses.

While the loss of credit and other functions may be used as a justification for government provision of credit to land reform beneficiaries, this further undermines market development and raises the costs of the reform program.

Moreover, landlords and tenants are sometimes bound with kinship ties [Sadoulet et al. 1997]. The ties allow tenants to have the landlords as a ready source of emergency loans or credits, especially in such cases as hospitalization and other sudden unfortuitous events. As with other forms of credit mentioned earlier, land reform may inadvertently supplant this institution by altering the kinship ties between landlords and tenants.

Furthermore, share tenancy provides an opportunity to ascend the "agricultural ladder". Spillman [1919] was the first to note that land tenure choices differ at several points in the life-cycle: first, the farmer starts out by being employed as a farm helper or permanent laborer during which he learns different techniques of farming from more experienced farmers. Afterwards, he may ascend the ladder and become a share tenant wherein he receives management know-how and other techniques from his landlord. As he builds up his farming skills and improves his financial standing, he progresses to becoming a fixed-rent leasehold tenant. If he succeeds, then he can buy his own farm and become an owner-farmer. When he becomes older or his farm size increases, he will have the option to hire farm-helpers or rent his land out to tenants.

Although Allen and Lueck [2002] showed that the particular steps of the Spillman ladder were not present in Midwestern US agriculture by the mid-1980s, this does not mean that there is no ladder. There are many forms of fixed-lease and share tenancy. It is in fact possible for a tenant to increase his income while moving from one form of fixed-lease to share tenancy to another form of fixed lease tenancy (Roumasset and Uy [1987]; Roumasset [1995]). James and Roumasset [1984] establish that share tenancy in the Philippines has sometimes served as a rung on the agricultural ladder. Low-asset migrants could begin as share tenants. After typically five years these migrants had established homesteads. Despite earning a lower rate of return they became middle-class households.

### *2.5. Disadvantages of share tenancy*

In general, strengthening property rights may have positive welfare and efficiency implications, especially regarding investment decisions [Besley 1995]. First, strong property rights ensure that other people will not expropriate the investment and the future gains from it. Second, better property rights make it easier to use land as collateral thus alleviating a possible constraint to investment funding. Third, better rights enhance investment incentives by expanding trading opportunities and the ability to exploit gains from trade. Besley found that better land rights (associated with the presence of rights to sell, rent, gift, mortgage, pledge or bequeath each field) indeed facilitated investment in some places in Ghana. Whether these arguments strengthen the case for tenancy reform depends on how secure tenant rights were in the first place and the roles of landlord and tenant in investment.

Banerjee et al. [2002] contend that security of tenure has two opposing effects. On the one hand, landlords may use the threat of eviction to induce tenants to work harder, and disallowing eviction restricts such incentive. On the other hand, greater security of tenure encourages tenant to invest more. In West Bengal, the authors found that the tenancy reforms from Operation Barga increased average rice yields productivity by 20 percent during the period 1979-1993 – representing 28 percent of actual increase in rice yields (69 percent) during the period. It is unclear to what extent yield increases were due to land reform, however, given the effect of other productivity enhancing measures that were contemporaneous with the Operation Barga program (e.g. tubewell investments). The reforms also increased tenant incomes and lowered their liabilities thus lowering shadow price of credit, i.e. the vehicle for the increase in productivity was not necessarily the improvement in security. This study also ignores losses inflicted on landlords and on their investments. In the Philippines, tenants have been primarily responsible for deciding on inputs, but landlords often specialize in land improvements [Roumasset 1995].

Several papers by Feder and colleagues (Feder and Feeny [1991], [1993]; Feder and Nishio [1999]; Feder et al. [1988]) also theoretically and empirically investigated the adverse effect of tenure insecurity on investments and welfare. However, almost all of the studies in Feder and Nishio [1999] as well as Feder et al. [1988] may be susceptible to selection bias. For instance, in Honduras, there was no indication whether the USAID-financed land titling project randomly selected regions to implement the program. Selecting relatively skilled, well-known, or influential beneficiaries would of course bias the results. Moreover, other unobservables such as land quality are not taken into account in the empirical studies.

Other studies find that land held under varying configurations of property rights will not necessarily be farmed at different levels of production efficiency. Gavian and Ehui [1999] use production data from Ethiopia to measure TFP in three informal and less secure land contracts (rented, share-cropped and borrowed)

relative to lands held under formal contract with the Ethiopian government. Although the informally contracted lands yielded 10-16 percent less per hectare, farmers of such lands applied more inputs per unit of land, not less. For this reason, the paper finds no empirical basis to support the hypothesis that land tenure is a constraint to agricultural productivity. Similarly, Holden and Johannes [2002] find that tenure insecurity in Ethiopia has no significant negative effect on the quantity of inputs.

In Ghana, alternative contractual arrangements such as caretaker-ship, rentals, share tenancy, etc. do not result in less planting of cocoa trees compared to owning the land (Otsuka et al. [2003]; Quisumbing et al. [2001a], [2001b]). In Madagascar, Jacoby and Minten [2007] found that land values and investments on titled and untitled plots were not significantly different. The authors conclude that costly formal titling has only supplanted customary land tenure systems in Madagascar that were legitimate, stable and functional.

One cannot assume that share tenants lack property rights. Share contracts are typically long in duration. Moreover, tenants in the Philippines often had the right to sell their tenancy rights to another farmer [Hayami and Kikuchi 1982]. This practice was subsequently been made illegal by the imposition of land reform. Land reform thus deprived share tenants of one right, even as it conferred another right, albeit one constrained by restrictions on disposition and performance conditionalities. Even where security has been improved, it should not come at the expense of other factors, such as the loss of credit, that harm productivity [Lipton 2009].

### *2.6 Towards an eclectic theory of share tenancy*

Singh [2000:21] argues persuasively against the possibility of a single theory of share tenancy:

> Sharecropping has existed in various times and places in various forms. It has disappeared over time and reappeared. Sometimes the tenant's share is one-half; sometimes it is not. Sometimes the output share equals the cost share; sometimes it does not. Sometimes productivity is higher on sharecropped land than on the other types of tenancy or with self-cultivation; sometimes it is not. Sometimes share-croppers are poor; sometimes they are prosperous. Sometimes sharecroppers produce risky cash crops; sometimes they produce for subsistence. I do not think a single theory can capture all of these aspects of sharecropping!

Regardless of whether one puts all causes of share tenancy into a single theory, however, it would not be prudent to base policy analysis on one of many theories to the exclusion of other causes and functions. In the rest of this section, we discuss some candidate theories that may inform a more complete understanding of the institution.

### *2.6.1. Partners for better or for worse*

The static theories reviewed above do not account for the fact that share contracts tend to be of long duration compared to fixed-lease contracts. Moreover, the canonical Stiglitz [1974] theory presumes that share tenants will be paid their reservation wage as agricultural workers. This is at odds with the observation that share tenants were commonly observed to be much better off than unskilled workers (e.g. Roumasset [1976]).

Grossman and Hart [1983] demonstrated that, when utility is additively separable in action and reward, and the agent's participation constraint will be binding for the static case.

This condition is satisfied in the Stiglitz share-tenancy model since the worker's utility function is simplified to take the form $U = EU[Y_w] + V(e)$, where $EU[Y_w]$ is the expected income of the worker and function $V(e)$ captures the disutility of effort $e$. This is additively separable in action (effort) and reward (expected utility). In general, however, there may be instances where the participation constraint does not bind, for example in dynamic models. The landlord has the incentive to keep the tenant since over time the tenant gains idiosyncratic knowledge about the plots that he farms. The tenant has a prior subjective probability distribution about the damage parameter. If damages in the first few years turn out greater than expected, the tenant will revise his expectations accordingly and quit where he only paid the same as an agricultural worker. To avoid losing the value of the tenant's acquired knowledge, the landlord chooses a farm size and share such that the probability of the tenant's quitting is low, i.e. the participation constraint is likely to be non-binding. In other words, the contract is designed such that landlord and tenant remain partners for better or for worse.

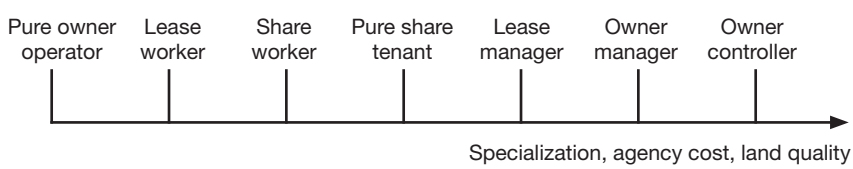
### *2.6.2. Cost sharing, specialization, and transaction cost*

Another stylized fact of agricultural organization in South and Southeast Asia is that the landlord's share in input costs is positively related to the landlord's output share and both positively related to land quality. Furthermore, the landlord's share of input costs is positively related to landlord's contribution to management, the quantity of hired labor, and intensity of cultivation generally (James and Roumasset [1979]; Roumasset [1984]; Hayami and Kikuchi [1982]; Ali [1979]; Bardhan [1984]). The correlation between input and output shares is a direct implication of the first-best principle, which requires that all factors be paid the value of their marginal products. The payment to the landowner should accordingly be approximated by the sum of the marginal product of land times the amount of land plus the marginal product of capital times the amount of capital contributed by the landowner. All other things being equal, the greater the amount of capital contributed by the landowner, the greater will be his share.

As noted by Braverman and Stiglitz [1982], equating input and output shares will avoid moral hazard in the tenant's choice of inputs. Why then are input and output shares often different? The "supportive" or "pure" share tenancy contracts observed on higher quality land involve 50-50 sharing of both outputs and inputs, while "non-supportive" or "share-worker" contracts typically involve no cost sharing but with landlord shares of 33 percent [Roumasset 1976]. This is because 50-50 sharing requires some monitoring of inputs such as seeds, fertilizer, and insecticides, lest the tenant not apply all of what was purchased. Greater agency costs to reduce-input shirking are warranted on high-quality lands where the demand for inputs is higher. But on lower-quality lands, where the demand for inputs is less, the landlord can economize on agency costs and incentivize input application through the higher tenant shares. Moreover, greater landlord contributions to management are warranted on a higher quality of land, and the resultant landlord presence economizes on monitoring costs.

More generally, higher-quality land warrants greater intensity of cultivation and more specialization. This is revealed in part by the positive relationship between land quality and the incidence of different organization forms moving rightwards along the specialization axis in Figure 3. At the extreme left, we have the owner-operated farm with no hired labor and no specialization. At the extreme right we have the capitalistic firm where the owner-controller acts as entrepreneur and hires a plantation manager who in turn oversees "divisions" of the firm such as the planting and harvesting teams, and even a motor pool with its own mechanics. The owner-managed farm is less specialized, with the owner doing the production management as well as the investment and maintenance of the farm infrastructure. Leasehold farms can be similarly distinguished between the lease-worker on lower quality lands who provides much of the farm labor and the lease-manager who focuses on production management and hires most of the labor.[18] That is, the organizational tree gets both wider and steeper as we move towards organizational forms more on the right. Higher land quality warrants greater specialization which warrants higher agency costs.

**FIGURE 3. A spectrum of agricultural firms**




[18] See Roumasset [1995] for additional details of the agricultural firm in the Philippines and Nepal.

In other words, agency costs as a percentage of farm income increase with land quality and specialization [Roumasset and Lee 2007], just as the transaction sector grows as a fraction of the whole economy with economic development [Wallis and North 1986]. The idea that agency or transaction costs are a sign of inefficiency, which is the very essence of the proposition that large farms and share tenancy are inefficient, is exactly backwards.

It is *unit* transaction cost that we want to reduce precisely to increase the *number* of transactions that come with specialization. As the economy proceeds from something closer to autarky to something closer to complete markets, along with an unlimited expansion of intermediate and final products, the number of transactions required increases exponentially such that total transaction costs increase [Yang 2003]. Specialization is the engine of economic development, and agency costs are the glue that facilitates specialization. As reviewed here, the theories of organization that disparage increasing transaction costs miss this distinction entirely.

### *2.6.3. Endogenous matching*

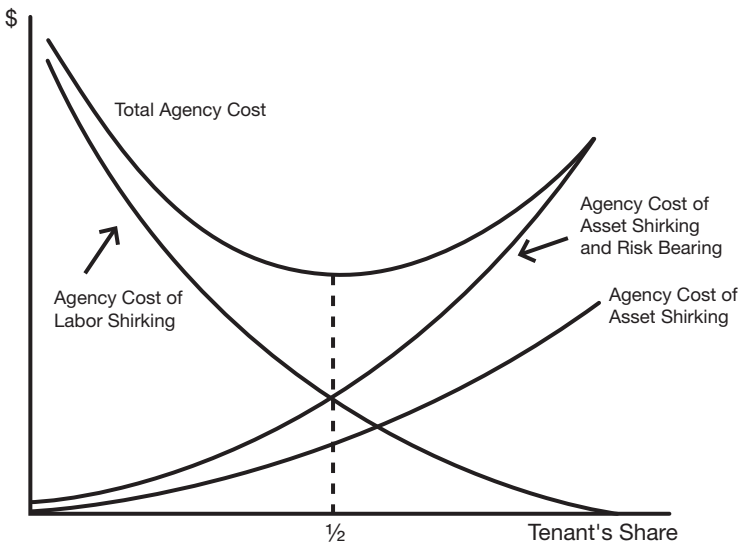
In all of the models discussed above, matching between landlord and tenant is taken as given. But clearly an important part of contracting regards matching of partners. Ghatak and Karaivanov [2013] introduces endogenous matching into a two-sided shirking model. Agents have heterogeneous abilities regarding the provision of managerial (primarily landlord) and labor (primarily tenant) inputs, and complementarities between the skill levels allow the agents to exploit gains from specialization. Share tenancy will dominate owner-operator cultivation and lease contracts where landlord and tenant have sufficient comparative advantages in management and labor respectively.

The assumptions of this model, however, are at odds with the fact that it is the tenant farmer, not the landlord, who typically has a comparative advantage in production management. Moreover, if the landlord does have a comparative advantage in management, he can hire labor, a possibility not allowed by the model. Finally, the model takes farm size and land quality as exogenous. As a result, the model is not likely to be useful for explaining actual patterns regarding farm size, tenure choice, productivity, and skill sets. Nonetheless the idea of endogenous matching is an important topic for a more complete theory of agricultural organization.

To see how different forces shaping share contracts might be combined into a single theory, consider Figure 4, which combines the asset-shirking and risk-bearing theories. The effect of repeating the contract for multiple periods lowers the agency costs from all sources. Since the landlord observes performance over multiple periods, she will be better able to separate the roles of luck and effort/skill in determining yield and thereby to detect subpar performance.

To that composite model, one would then add expected duration as a characteristic of alternative contracts, rising agency costs as a function of optimal specialization, and endogenous matching. In such a model, optimal organizational forms will satisfy multiple functions. The diversity of agroclimatic conditions, land quality, and skill levels and shadow prices across economic agents suggests that efficient agricultural organization will lead to a wide diversity of arrangements, including various types of share tenancy. In this environment, there is a need for more organization forms, not less. To the extent that actual farm organization reflects efficiency, banning some forms from the organizational menu can only subtract from efficiency by forcing agents to substitute forms that are less suited to the multiple functions required. Dynamic efficiency, which involves the evolution of organizational form, will be similarly decreased.

**FIGURE 4. Towards an eclectic theory of share tenancy**




### *2.7. Other empirical findings*

#### *2.7.1. Results supporting inefficiency*

Bell [1977] and Shaban [1987] are well known studies that suggest that share tenancy is inefficient. Both studies compare outputs and inputs of tenants who owned plots and who sharecropped plots in the same farms. Bell, comparing means of output and input variables from owned and shared plots, finds that both input and output per unit of land are higher in the former than in the latter. The Shaban study uses a SUR regression method on pooled Indian village data with different agroclimatic characteristics. Shaban finds that controlling for irrigation,

plot value and soil quality, output per acre is significantly higher by 16.3 percent higher on owned plots relative to sharecropped plots. Shaban also suggests that lease is likely to be more productive than share tenancy, inasmuch as there were no significant yield and input differences between owned plots and rented plots. As pointed out by Hayami and Otsuka [1993], however, the non-significance was due to the rarity of fixed-rent contracts in the sample (i.e. rent contracts were not significantly more productive than share contracts).

H-O also note that the legal prohibition of fixed-rent tenancy presumably biased the effect of share tenancy on outputs and inputs relative to owner-operated farms and claim that these results "represent strong evidence for the inefficiency of share tenancy to emerge under institutional constraints on tenancy choice rather than evidence for the inefficiency of share tenancy generally" [Hayami and Otsuka 1993: 102]. In particular, if the sample of rental farms that converted to share tenancy were of lower land quality, that would lead to the appearance that post-reform share tenancy was less productive.[19]

A more fundamental critique of the Bell-Shaban findings is that they regard contractual choice as exogenous. Since the contract is itself endogenous, regressing yield or other measure of productivity will lead to biased estimates. A better procedure would be to use an instrumental variable in place of contract choice, e.g. as a function of land quality. Again, the validity of the instruments will be crucial in such a study.

### *2.7.2. The case against the case for inefficiency*

Contrary to Bell and Shaban's results, there are studies that do not find that share tenancy is significantly inefficient even for the same farmer that has own and shared plots. For instance, Pender and Fafchamps [2001] do not find empirical support for the "Marshallian" prediction of inefficient sharecropping, since factor intensity and output value are not significantly different on tenants' own vs. sharecropped fields in the Arsi zone of the Oromia region of Ethiopia. In Palanpur in Northern India, Sharma and Dreze [1996] show that tenants, on average, own roughly as much land as landlords and are not significantly poorer. Thus, there is no evidence to suggest that share tenants are worse off.

The literature also provides several possible reasons why it is premature to conclude that share tenancy is inefficient. First, share tenancy may be an efficient response to varying farm conditions. Roumasset ([1976], [1995]) finds diversity in tenure choice under varied agroclimatic conditions and no evidence that these arrangements are inefficient. For example, a sample of rice farms in Laguna with high rents per hectare and favorable soil conditions were operated under a pure

[19] In the Philippines, Estudillo and Otsuka [1999] find significantly lower residual profit per hectare under share tenancy.

share tenancy contract where the landlords receive 50 percent of the gross harvest and paid 50 percent of the cost of seeds and fertilizer. For the sample of farms in Albay where soil and weather conditions are worse, share-lease contracts were used under which landowners receive only 1/3 of the harvest but did not share in the costs.

Second, share tenancy allows for flexibility in input use. Moreover, share tenancy is a form of "partnership" between tenant and landlord regarding complex management decision and joint provision of many inputs. Jodha [1984] uses village survey data to show the prevalence of share tenancy in semiarid tropical India. He finds that tenancy serves several functions. First, the data shows that tenancy is predominant in villages that are prone to drought or have better irrigation. This suggests that share tenancy allows for periodic resource adjustment in the face of varying water supply conditions. Second, the same data showed that entering into a share tenancy agreement often interlocks with factor markets or factor-product markets such as credit and marketing.

Third, share tenancy usually associates with close kinship relations of tenants to landlords. This avoids the "inefficiency" associated with the unenforceability of short-term contracts. Sadoulet et al. [1997] finds evidence from the Philippines that the behavior of share tenants with a kinship relation with their landlord is not affected by the terms of the contract, while behavior of the other share tenants responds to the contract terms.

In general, empirical studies of contractual efficiency suffer from the same problem as those of farm size and efficiency. Both sets of studies fail to fully endogenize the determination of farm size and contractual form.

## 3. Welfare and equity

### *3.1. Mechanisms through which land reform affects economic welfare*

According to Lipton [2009], there are five channels by which land reform can potentially raise welfare of both beneficiaries and non-beneficiaries. We discuss each of these in turn below.

#### *3.1.1. Asset transfer*

Transfer of land makes beneficiaries wealthier and provides them with greater income. For example, a 50 percent share tenant is conferred with a transfer to the extent that the land value exceeds the present value of his mortgage. Moreover, he now receives 100 percent of farm income. Both effects will be partially offset, however, to the extent that the farmer loses access to credit, managerial inputs of the landlord, and other benefits reviewed in Part 2. Given that the share tenants typically owned equity in the farm pre-reform (e.g. equivalent to one year's harvest, Hayami and Kikuchi [1982]), their equity value should be subtracted

from the value of the land before making a comparison with the present value of the mortgage. The value of the transfer will be even lower if the beneficiary was formerly an agricultural worker and has little aptitude, experience, and appetite for farming. There have allegedly been cases on poor quality land where the mortgage liability is greater than the land value (e.g. where the landlord has initiated reform because her potential compensation is greater than the land value).

#### *3.1.2. Farm operation*

Lipton argues that beneficiaries of land reform can earn greater income from operating the farm inasmuch as they now receive the entire production instead of, say, 50 percent. If they were farm workers, they now receive the land rent in addition to the fruits of their labor. However, these gains must be weighed against the loss of management inputs and other functions that the landlord provides the tenants. In addition, the tenant may face a higher shadow price of credit since it loses access to funds from the landlord.

#### *3.1.3. Non-farm income*

Another of Lipton's mechanisms by which beneficiaries increase their welfare from land reform is that increases in farm income have the potential to also increase non-farm income, for example, if profits from farming were invested in other businesses such as a store or other small businesses. However, just as being cut-off from landlord credit may decrease on-farm investments, non-farm investments may be similarly depressed.

#### *3.1.4. Demand for labor*

If small farms are more efficient than large farms, then rendering the distribution of farm sizes more uniform through land reform will increase the demand for labor thereby increasing labor income of the poor. As discussed in Section 1, however, there is no compelling evidence that small farms are truly more efficient. Moreover, the market for hired agricultural labor is likely to shrink, inasmuch as former tenants and workers may not have access to affordable credit.

#### *3.1.5. Reduction in overall land inequality*

Finally, Lipton submits that economic welfare is enhanced by reducing overall land inequality. In the literature, there are many ways in which high levels inequality reduce welfare. First, high inequality levels stunt future economic growth [Persson and Tabellini 1994]. Second, it may exacerbate credit constraints that makes it more difficult for the poor to advance [Deininger and Squire 1998]. Third, it encourages rent-seeking activities [Rodrik 1996]. Finally, high inequality may blunt the effect of economic growth on poverty reduction [Datt and Ravallion

2011]. To the extent that reductions in land inequality translates into a reduction of other forms of inequality, then land reform improves overall economic welfare. However, implementing policies to decrease inequality may not be politically feasible.

According to Acemoglu and Robinson [2012], predatory institutions arise largely as historical accidents and once in place will tend to undermine well-intentioned attempts to redistribute income (see e.g. Part 4 below on the implementation of land reform in the Marcos years). In this view, redistribution requires prior action to unbalance the existing political equilibrium, e.g. by making more transparent who gains and loses from rent-seeking policies. This in turn may contribute to the development of more inclusive institutions to "enforce property rights, create a level playing field, and encourage investments in new technologies and skills are more conducive to economic growth than extractive economic institutions that are structured to extract resources from the many by the few" [429-430].

Reducing land inequality is also thought to improve agricultural policy and research. The argument for making the distribution of farm sizes more equal relates to the bimodal hypothesis according to which countries with highly skewed land distributions (concentrated land ownership and small modal farm size) tend to direct agricultural research towards large commercial farms to the neglect of small holders [Mellor and Johnston 1984; de Janvry and Dethier 1985]. This hypothesis implicitly assumes, however, that redistributing land is politically easier than directing public agricultural research towards it highest and best use. The reality is likely to be the opposite.

Land redistribution as a tool of equity should first recognize the nature of horizontal as well as vertical equity. Vertical equity refers to idea that people with a greater ability to pay bear a larger share of the costs of government. Horizontal equity refers to the principle of equal treatment of equals. As Rawls argues in *The Theory of Justice*, horizontal equity should take precedence over vertical equity for both reasons of justice and policy coherence. Land reform violates horizontal equity by discriminating against one form of wealth (land holdings) vs. others. People unlucky enough to hold land as their main asset are made worse off by the policy. However, even for people who hold land, the policy is even more confiscatory for people with high quality land if the policy fails to properly base landlord compensation on land quality. For instance, by basing compensation on the principle that 25 percent of yield is a fair rent, the reform confiscates value from owners of good and average farms but actually over-rewards owners of poor-quality land [James and Roumasset 1979]. As a result, friends and relatives of some owners of poor-quality land submit bogus claims that they have been working the land as tenants so that the landlord receives more than the land is worth (and ownership remains in the family).

Neither is land reform an effective instrument of vertical equity. In the Philippines, there is evidence that share tenants are not poor in the first place [Hayami and Kikuchi 1982; Roumasset 1976]. The land reform program in the case of rice may have transferred land not to the poorest segments of the society but to more middle class share tenants and farmers.

In short, land reform programs have violated even its principle of achieving vertical and horizontal equity: At least in the Philippine case the land reform program has taken land from the rich and some middle-class landowners and distributed the land not only to the poor but to some middle class share tenants, violating vertical equity. Moreover, other forms of wealth are not taxed and not all poor people are benefiting from the reforms, violating horizontal equity.

Thus, land reform programs may be cost ineffective in the sense that it is not targeting enough poor people while incurring huge economic costs. Fabella [2014] found for example that there were around 26 million poor Filipinos and an estimated 2.6 million farmer beneficiaries. The historical record of the land reform program targeting the poor has been spotty inasmuch as it has transferred land from the rich and middle class to some poor and some middle-class beneficiaries. Moreover, the true economic cost of the program goes beyond the fiscal cost of implementation but should also include the distortions created by the program. Taken together, the land reform program may have generated negative net benefits, that is, small benefits with huge economic costs. Thus, the resources that were devoted to funding the program should have been better spent financing other direct mechanisms for poverty alleviation, such as cash transfers.

### *3.2. Unintended consequences of land reform*

There are many unintended consequences of land reform. In this section we concentrate on those which may be relevant in the Philippine land reform experience.

#### *3.2.1 Immobility in the land market*

Efficiency requires mobility that allows land to be engaged in its ever-changing highest and best use. This can be achieved via an active land market where people can own or lease land to achieve a desired operational land size. Moreover, the comparative advantage of farmers may be highly dynamic, as new opportunities arise, farmers age, etc. An active land market allows agents to adjust to these changing circumstances. Impediments in the ability to adjust operational holdings will correspondingly decrease economic efficiency. In the case of the Philippines, an adverse consequence of land reform is that it tends to suppress the land market by (i) restricting the sale, lease and acquisition of beneficiary lands and (ii) rendering vague the property rights associated with the collective Certificates of Land Ownership Award (CLOA) (Balisacan [2007]; Fabella [2014]).

Regarding (i), Section 27 of the Comprehensive Agrarian Reform Law sets the parameters on the transferability of awarded lands:

> Lands acquired by beneficiaries under this Act may not be sold, transferred or conveyed except through hereditary succession, or to the government, or the LBP, or to other qualified beneficiaries for a period of ten (10) years.

Moreover, beneficiaries can only sell or convert land for non-agricultural uses only if they fully amortize the awarded land.[20] Unfortunately, no systematic information or database exists from the Land Bank on the status of farmer amortizations rendering it difficult to assess the status of beneficiary lands and to enforce collections. While the 10-year moratorium on land transactions is itself contributing to making the land market less active, it is the condition of full amortization that can be binding since there is anecdotal evidence that beneficiaries do not pay off their mortgages on schedule, both because of the lax enforcement effort and because payments would be onerous for some farmers.[21]

The restriction on land markets has limited the potential for more productive farm enterprises and more capable farmers to acquire more land, thus constraining productivity and efficiency. Sicat [2014] regards that "[s]uch freezing of assets from other forms of negotiability hampers the value of [the awarded land]. The farmer is definitely handicapped and farming efficiency is prevented". Fabella [2014] adds that "the resulting demise of the formal land market" has also "effectively eviscerated the formal rural credit market".

In the same manner, the restrictions on transferability may hamper the rural-urban migration process through a lock-in effect that keeps beneficiaries in farming despite more lucrative opportunities, because of the "use it or lose it" provision. This effect prevents market exchanges that would normally exploit comparative advantage to the mutual gains of contracting parties.

In addition, the provision of Section 6 regarding the retention limit of five hectares has impeded efficiency-enhancing consolidations,[22] e.g. as may be

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[20] Section 26 of CARL states that "[l]and awarded pursuant to this Act shall be paid for by the beneficiaries to the LBP in thirty (30) annual amortizations at six percent (6 percent) interest per annum." Furthermore, "[t]he LBP shall have a lien by way of mortgage on the land awarded to beneficiary and this mortgage may be foreclosed by the LBP for non-payment of an aggregate of three (3) annual amortizations. The LBP shall advise the DAR of such proceedings and the latter shall subsequently award the forfeited landholding to other qualified beneficiaries. A beneficiary whose land as provided herein has been foreclosed shall thereafter be permanently disqualified from becoming a beneficiary under this Act."

[21] Sicat [2014] believes that "payments for the land represents a large portion of the [farmer's] work effort".

[22] Section 6 of CARL states that "[e]xcept as otherwise provided in this Act, no person may own or retain, directly, any public or private agricultural land, the size of which shall vary according to factors governing a viable family-sized farm, such as commodity produced, terrain, infrastructure, and soil fertility as determined by the Presidential Agrarian Reform Council (PARC) created hereunder, but *in no case shall the retention by the landowner exceed five (5) hectares*. Three (3) hectares may be awarded to each child of the landowner, subject to the following qualifications: (1) that he is at least fifteen (15) years of age; and (2) that he is actually tilling the land or directly managing the farm." (Emphasis ours)

warranted by the supermarket revolution. One of the facets of the supermarket revolution is the imposition of certain standards which may place small farms at a transaction cost disadvantage in marketing (e.g. [Lipton 2009; Roumasset 2007, 2008, 2010]) and further augmenting the disadvantage they already face in credit markets. This may prevent productivity gains both directly and indirectly through the retardation of on-farm infrastructure such as irrigation and land levelling and off-farm infrastructure for transportation and processing.

Restrictions on the conversion of beneficiary lands to other (non-agricultural) purposes may also prevent the land market from allocating land according the principle of comparative advantage. Section 65 of the CARL states that:

> After the lapse of five (5) years from its award, when the land ceases to be economically feasible and sound for agricultural purposes, or the locality has become urbanized and the land will have greater economic value for residential, commercial or industrial purposes, the DAR, upon application of the beneficiary or the landowner, with due notice to the affected parties, and subject to existing laws, may authorize the reclassification or conversion of the land and its disposition: *Provided, that the beneficiary shall have fully paid his obligation.* (Emphasis ours)

Again, the condition of full payment is likely to be the limiting factor to beneficiaries who may want to convert or sell the land for more profitable uses. Fabella [2014] notes that the response to this provision is often to make the land idle or even destroy irrigation facilities to escape the provisions of land reform.

Regarding (ii), land reform beneficiaries in the Philippines are awarded a Certificate of Land Ownership Award (CLOA), which can either be an individual or collective CLOA. Beneficiaries with individual CLOAs are akin to individual titles. On the other hand, beneficiaries with collective CLOAs do not have property rights to an individual parcel of land. These CLOAs are issued in the name of the co-owners of a collective organization. Collective CLOAs were typically instituted for cost considerations and expediency in land acquisition, especially when parcellization is difficult, e.g. for former sugar plantations. While these were intended to be "transition" titles, around 70 percent of awarded lands are still under collective ownership (World Bank [2009]; Nozawa [2016]).[23] This is another restriction to land market mobility. Beneficiaries cannot sell the land until they have an individual title.

[23] Currently, it is in DAR's mandate to parcellize these CLOAs under Section 10 of Republic Act 9700: "An Act strengthening the Comprehensive Agrarian Reform Program (CARP), extending the acquisition and distribution of all agricultural lands, instituting necessary reforms, amending for the purpose certain provisions of Republic Act No. 6657, otherwise known as the Comprehensive Agrarian Reform Law of 1988, as amended, and appropriating funds therefore".

Although there were cost savings by awarding the CLOAs collectively, for instance, by reducing the need for cadastral surveys for individual plots, it has had the unintended consequence of shutting out the beneficiary from the credit market. Tenants lose access to credit from their landlords and cannot access the formal credit sector inasmuch as CLOAs cannot serve the purpose of collateral for individual loans. As mentioned above, share tenants typically had secure property rights before land reform to the extent that they could even sell said right [Hayami and Kikuchi 1982]. In contrast, beneficiaries with only CLOA credentials are in a kind of limbo. They may be forced to pay high interest rates to informal credit sources, and face a high degree of uncertainty regarding when they will be able to obtain individual titles. This has an inevitable retarding effect on investments in land improvements and farm equipment.

All these restrictions on land markets and the insecurity of property rights due to the Philippine land reform program have contributed to the reduction in competitiveness of agricultural marketing sector. For instance, Dawe et al. [2008] finds overall inefficiency of Philippine agriculture by showing that Central Luzon marketing mark-ups are three times those in Central Plains, Thailand. In addition, the program may have bestowed political power to agents that may potentially lose from agricultural reform. As an illustration, land reform may have encouraged the consolidation of the rice marketing sector, cooperatives and small farmers and impeded the ability to reform highly distortionary rice policy that have potential losses amounting to $2 billion per year.

### *3.2.2. Banning share tenancy*

The banning of share tenancy affects not only the landlord of retained lands who prefers share tenancy over regulated leasehold but also the land reform beneficiary who wants to hire a share tenant, e.g. due to an increase in the beneficiary's shadow price of labor (due to old age, income effects, or other opportunities). As a result, an inferior institution must be used. In the Philippines, the response to the banning of share tenancy was the institutional innovation involving the hiring of permanent workers. Hayami and Otsuka 1993:151 describe a typical permanent worker as:

> either single or married with family. He and his family live in a shanty either inside or outside the employer's residential quarters. He has the obligation to perform certain preassigned tasks, while he is allowed to work outside his master's farm as a casual worker in order to supplement his income, paid in a fixed amount of paddy ranging from 10 to 30 cavans…depending on experience and skill as well as the scope of tasks assigned to him, or a share of output (usually 10 per cent).

Otsuka, Chuma and Hayami [1993] find that the hiring of permanent workers because of the ban on share tenancy regulation was "inefficient" in the sense that residual profit of farms relying on permanent labor is about three-fourths of the profit in farms without that institution. This inefficiency may stem from the high agency cost of supervising permanent farm workers [Hayami and Otsuka 1993] or simple neglect by the owner, who may be pursuing other opportunities. Indeed, CARP-style land reforms with restrictions on lease and sale impede the ability of beneficiaries to take full advantage of land transfers. Because of the wealth effect, beneficiaries want to move away from the more arduous farming tasks [Roumasset and Smith 1981]. As these beneficiaries move up the agricultural ladder, they may want to hire share tenants to perform those tasks or to undertake new ventures altogether. The accompanying restrictions of the reforms may effectively remove these opportunities. If the intention of the reforms was to confer property rights, the restrictions take away with one hand much of what was conferred by the other.

Landlords of retained land, who were previously employing share tenants were forced to convert to regulated leasehold contracts. However, leasehold contracts are less flexible regarding changing conditions. For example, share tenancy allows periodic resource adjustments in the face of varying water supply conditions [Jodha 1984]. Moreover, since the rent is lower than what landlord previously received[24] and because of the difficulty of eviction, landlords are not incentivized to give credit. This further undermines the capability of the former share tenants (now leaseholders) to be productive on the land they are now tilling.

A recent study on the Philippines [Adamopoulos and Restuccia, 2020] confirmed that all of this negative impact resulted in CARP lowering Philippine agricultural productivity by 17 percent. The authors emphasize the loss in economies of scale due to the constraint on farm size, the mismatch of skills, technique and crop choice, and the type and size of farms. In addition, they cite the distortion in the labor market, e.g. driving middle-class landlords to seek other occupations, and keeping workers in agriculture who would otherwise have migrated to other sectors.

### *3.2.3. Black-hole economics*

In response to the perception that land reform may have lowered agricultural productivity, there have been calls for government to step in and provide more "support services", such as credit, for beneficiaries. The repayment record for small farmers receiving government subsidized credit is poor, however [de

[24] Section 34 of Republic Act 3844 states that "the lease of riceland and lands devoted to other crops shall not be more than the equivalent of twenty-five per centum of the average normal harvest during the three agricultural years immediately preceding the date the leasehold was established after deducting the amount used for seeds and the cost of harvesting, threshing, loading, hauling and processing, whichever are applicable."

Aghion and Morduch 2005]. Moreover, to the extent that government subsidies shrink credit provision by the private sector, this will simply increase the need for government involvement, thus creating a black hole of public spending instead of promoting market deepening.

### *3.3. Empirical problems with estimating welfare effects*

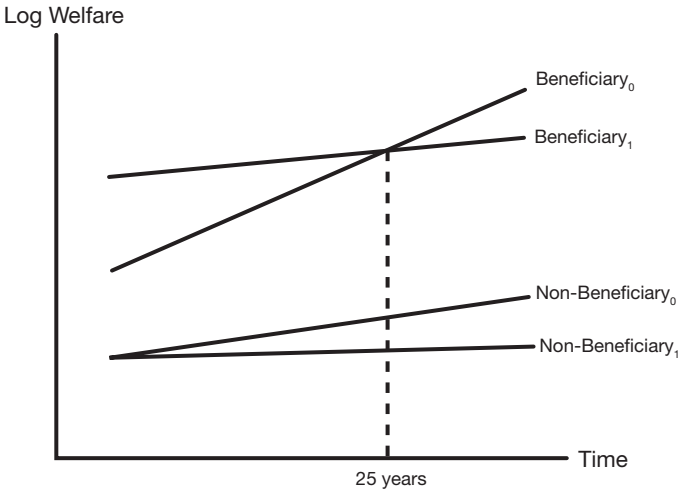
A major concern among land reform policy makers is whether the program is successful in terms of increasing welfare. Welfare here may mean not only welfare of the beneficiaries but also overall welfare (including non-beneficiaries, consumers, etc.) in the economy. In practice, it is difficult to determine the welfare impact of land reform due to the confounding effects of other policies including trade, public investment, and other regulations. All these factors make it difficult to identify the effects of land reform on rural poverty [Balisacan 2007].

It is also difficult to infer the welfare effects of land reform on beneficiaries by comparing their incomes with non-beneficiaries. First, one would need to sort out the effects of reform from the factors leading to the selection of beneficiaries. Secondly, the effects of reform beg the question of the counterfactual – what "beneficiary" incomes would have been in the absence of reforms.

Regarding the second question, Figure 5 illustrates hypothetical welfare trajectories of beneficiaries and non-beneficiaries, where the subscripts 1 and 0 denote with and without land reform. At the start of implementation, there is a marked increase in the welfare of beneficiaries, due to their improved equity position, while those of the non-beneficiaries remain unchanged. However, due to the distortions created by land reform in rural land, labor, and credit markets, the *growth* for both beneficiaries and non-beneficiaries is now slower (but growth of welfare of beneficiaries slightly higher than non-beneficiaries) post-land reform. In this scenario, researchers may be tempted to conclude that land reform has improved the welfare of the beneficiaries.

However, as shown in Figure 5, the welfare of beneficiaries may be the same (e.g. after 25 years) as in the relevant counterfactual and about to become worse, while the welfare of non-beneficiaries has declined. Thus, the observation that the welfare difference has increased for beneficiaries under land reform is only illusory, that is, the slower growth of welfare of non-beneficiaries due to land reform artificially lowered the benchmark by which welfare is compared. This suggests the need for caution in empirical studies of the welfare impact of land reform.

**FIGURE 5. Hypothetical welfare effects of land reform**




## 4. Political economy

As pointed out in Section 3.1, there are several ways in which land reform can increase welfare. To the extent that land reform reduces inequality, it may have the potential to spur subsequent economic growth [Persson and Tabellini 1994]. In particular, land reform proponents often point to land reform as undergirding the economic success of the East Asian Tigers, namely, Japan, South Korea and Taiwan [Studwell 2013]. It is hard to evaluate this claim, however, inasmuch as the preconditions that made land reform successful may have been the drivers of economic success. Hayami et al. [1990] contend that the land reform success of these countries was due to the "favorable conditions" in those countries' political and social environments.

Even if land reform did contribute to economic success, the lesson is not transferable to other countries due to limits of political feasibility. For example, Japan's land reform was successful because of the weak political position of the ruling elite after the loss in World War II. South Korea's success from the end of World War II to the 1950s can be traced to the loss of political clout by the large landowners due the perception of their collaboration with the Japanese. Taiwan's land reform in the 1950s was executed by the exiled Kouminang Nationalist Government, led by Chiang Kai Shek, seizing power from the large Japanese landowners and the local elite, who were political opponents.

In addition, all these successful land reform programs were quickly implemented and were limited in scope. For instance, Japan distributed 1.76 million out of 37 million hectares (4.7 percent) of rice lands while Taiwan distributed 0.5 million out of 3.62 million hectares (14 percent) of rice lands in 5

years or less [Fabella 2014]. The relative underperformance of various land reform programs implemented around the world may be due to the lack of these political and social conditions and the limits in scope that characterized the successful East Asian programs.

It is also debatable whether historical land reform was executed with efficiency considerations in mind. After surveying twenty-six centuries of land reform in different contexts, Tuma [1965:184] concluded that "political objectives were primary in all the reforms" with very few exceptions. Similarly, LaCroix [2014] argues that most of the confiscation and property redistribution in East Asian countries after World War II was to bolster the new government coalition's position and weaken opponents. For instance, Taiwan and Korea expropriated property from lands controlled by Japanese colonizers and corporations and transferred it to indigenous farmers in order to bolster support of the new government. Land reform in China in the early 1950s confiscated agricultural lands from dominant landowners without compensation while executing an estimated one to three million of these landowners. Japan's land reform in the late 1940s was initiated not by the local government but by the US-led Supreme Command of the Allied Powers that seized agricultural lands from both resident and absentee landlords with very minimal compensation [LaCroix 2014].

The history of land reform in the Philippines similarly involves political motives. Government expropriation began with friar land which was thought to be the source of peasant unrest in the early phase of American occupation. It wasn't until Diosdado Macapagal's term that land reform was intended "to create a truly viable social and economic structure in agriculture conducive to greater productivity and higher farm incomes" [Agricultural Land Reform Code RA 3844 of 1963]. Subsequent land reform programs were at least partly designed to quell different phases of peasant unrest including the Sakdals in the 1930s, the Hukbalahaps in the 50s and 60s, and the New People's Army movement in the 70s and 80s.

Land reform was also employed to consolidate the ruling coalition's power by rewarding political allies. For example, during the 1970s, the Bureau of Lands "allowed Danding Cojuangco to exchange 1,600 hectares of developed rice and corn lands … for 16,000 hectares of undeveloped land in Mindanao – which was, of course, exempt from PD 27". 11,000 of those hectares were on Bugsuk Island where hundreds of settlers already had title to their land, and many refused to move. "Cojuangco 'purchased their land rights' and had them 'relocated' to Palawan…But, of course, a lowly bureau director was in no position to halt this totally illegal process." [Wurfel 2000]

Relatedly, land reform was also used to dispossess political rivals and to weaken the opposition.

> Primary was the desire to undermine the strength of landed elites that had provided troublesome opposition before martial law. Aquino family land was among the first to be seized – and not just because it was in the "A's". Sergio Osmena, Jr., of Cebu, who had opposed Marcos in the 1969 elections, owned extensive corn land. (Marcos' opposition among sugar and coconut planters was dealt with somewhat later in another fashion, through marketing monopolies. There was clearly an advantage in confronting different elites at different times.) "Operation Land Transfer" of the Department of Agrarian Reform started to cover large estates first, and, in fact, never finished the category below 24 has. It appears that the presidential disinterest in the programme after the first few years was related to the fact that his primary goal had already been accomplished. [Wurfel 1989]

More recently, President Estrada and President Arroyo also used land reform against the family of former president Cory Aquino when she became critical of both administrations [Borras 2007].

Thus, land reform in the Philippines shared similar characteristics with the experience of other East Asian countries in that it was used to placate peasant unrest and as a political tool by the ruling coalition to dispossess and weaken the opposition. However, the protracted episodes of Philippine land reform with its comprehensive nature (including all lands regardless of crop produced or tenure status) stand in stark contrast to the episodes in post-war East Asia where land reform was limited in scope and accomplished in a short amount of time (Hayami, Qusumbing, and Adriano [1991]; Fabella [2014]).

Another difference, at least in the South Korea case, was that the government left support services such as marketing, credit and input supplies to the market [Ray 1988]. This decreased the dependence of farmers on state subsidies which have the potential to create a black hole of state subsidies requiring future increasing government expenditures as discussed in section 3.2.3.

## 5. Conclusions

Fabella has effectively argued that land reform in the Philippines was ineffective due to problems of design and implementation. In this paper, we have attempted to complement this view by showing that failure was inevitable due to the misconceptions on which the reform was based.

There is widespread support in the literature for land-to-the-tiller reform based on the proposition that large farms face a transaction cost disadvantage with respect to hired labor. Share tenancy is similarly damned in the canonical theory inasmuch as agency costs are thought to be unnecessary once tenants are converted into owner-operators. While the case against share tenancy has been largely discredited on grounds that the agency costs of share tenancy are low in a dynamic setting, even these critics accept the false premise that agency costs should be avoided if possible.

The literature fails to recognize, however, that agency costs are the price of specialization and that agency costs increase in the natural course of economic development. Indeed, the pre-reform agricultural firm in the Philippines was already complex. Share tenancy was a partnership in which landlords contributed credit and land improvements, in addition to land, and participated in innovation; while tenants undertook production management, supervision, and management intensive labor such as the application of agricultural chemicals. Moreover, tenant farmers themselves engaged hired labor using a variety of contractual forms including payment by share, piece, and wage.

To the extent that specialization is the engine of growth, top-down attempts to lower agency costs by mandating owner operator firms is a move backwards on the evolutionary ladder and retards economic development. If the land-to-the-tiller ideal of the reform were achieved, specialization would be entirely eliminated. Given the rarity of the pure owner-operator form, however, agents will not avoid hired labor, but simply move to inferior forms.

With only one exception that we were able to identify, the empirical studies of the productivity effects of small farms and share tenancy suffer from misplaced exogeneity. Inasmuch as both farm size and tenure choice are endogenous, regressing productivity on farm size and/or contractual form leads to biased estimates, regardless of the (invariably incomplete) control variables that are added as regressors.

Land reform also has questionable merits on equity grounds. It violates horizontal equity by discriminating against landowners relative to those holding their wealth in other forms. Vertical equity may be only weakly satisfied since landlords are not necessarily wealthy, beneficiaries are not necessarily poor, and the number of beneficiaries is small relative to the population below the poverty line. Given the administrative and other costs, land reform may be a very leaky bucket in terms of the full economic cost of uplifting the poor.

The effectiveness of land reform may also be limited by the tendency of political objectives to influence implementation. First, reforms can be implemented to strengthen the ruling coalition against opponents. Secondly, opposition to the reforms may limit implementation for example regarding the ability of powerful groups to obtain exceptions.

In general, top-down attempts to redesign agricultural organization are likely to detract from the well-intentioned objectives of increased agricultural productivity and poverty reduction. As Friedrich von Hayek put it in his Nobel-prize acceptance speech:

> If man is not to do more harm than good in his efforts to improve the social order, he will have to learn that in this, as in all other fields where essential complexity of an organized kind prevails, he cannot acquire the full knowledge which would make mastery of the events possible. He will therefore have to use what knowledge he can achieve, not to shape the results as the craftsman shapes his handiwork, but rather to cultivate a growth by providing the appropriate environment, in the manner in which the gardener does this for his plants.

An efficient agricultural tapestry is diverse, with many farm sizes and organizational forms combining and incentivizing different crops, farm sizes, land qualities, skills, and entrepreneurial fervors. Trying to replace the guided market's ability to efficiently organize with top-down bans, constraints, and subsidies requires a level of benevolence, omniscience, and omnipotence of which governments, being run by less than godly humans, are not capable.

Trying to determine which size or contractual form is most efficient is a fool's errand. As Collier and Dercon [2014] have argued for the case of Africa, the massive challenge of increasing agricultural productivity cannot be achieved by a top-down focus on smallholders alone, nor by a "rush to establish mega farms". Rather, a pluralistic approach that facilitates bottom-up responses to new opportunities and the very diverse resources to meet them is indicated.

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