

Fabella, Raul V.

Working Paper

Why fixed rent contracts are less prevalent: Weak third party enforcement and endogenous principal type

UPSE Discussion Paper, No. 2016-06

Provided in Cooperation with:

University of the Philippines School of Economics (UPSE)

Suggested Citation: Fabella, Raul V. (2016) : Why fixed rent contracts are less prevalent: Weak third party enforcement and endogenous principal type, UPSE Discussion Paper, No. 2016-06, University of the Philippines, School of Economics (UPSE), Quezon City

This Version is available at:

<https://hdl.handle.net/10419/162632>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



UP School of Economics Discussion Papers

Discussion Paper No. 2016-06

August 2016

Why Fixed Rent Contracts are Less Prevalent: Weak Third Party Enforcement and Endogenous Principal Type

by

Raul V. Fabella

University of the Philippines School of Economics
and
National Academy of Science and Technology

UPSE Discussion Papers are preliminary versions circulated privately to elicit critical comments. They are protected by Republic Act No. 8293 and are not for quotation or reprinting without prior approval.

**Why Fixed Rent Contracts are Less Prevalent:
Weak Third Party Enforcement and Endogenous Principal Type**

by

Raul V. Fabella

School of Economics University of the Philippines

Abstract

We revisit the question of why fixed rent contracts are less prevalent than crop share contracts despite Marshallian inefficiency. We consider the case where the type of the principal is endogenous to contract provisions and reneging by the principal may pay due to weak third party enforcement (TPE). We imbed the quality of TPE into the participation constraint of the agent in an effort-in-advance P-A model. The governance regime explicitly involves interplay of three categories of the Northian enforcement, viz., first, second and third party enforcement. Weak and strong TPE are formally defined. We show that the general contract derived nests the usual textbook contract when TPE is strong; weak TPE on the other hand results in a strictly positive induced risk aversion which always exceeds the inherent risk aversion of the agent. This prevents the power of the contract to equal one even when the agent is risk-neutral, thus, rendering a fixed-rent contract sub-optimal.

JEL Classification D23, D82, D86

Key words: sharecropping, weak TPE, endogenous type, induced risk aversion

Mailing address: Dr. Raul V. Fabella
School of Economics
University of the Philippines
Diliman, Quezon City 1101
Email: rvfabella@econ.upd.edu.ph; raulfabella@yahoo.com.ph

Acknowledgments: The author thanks Ma. Cristina Bernido-Fabella for excellent editorial help.

1. Introduction

Why are fixed rent contracts (FRC) less prevalent than mid-range agricultural contracts, such as share contracts, despite the classical observation (Smith, 1776; Mill, 1848) made salient by Alfred Marshall's famous footnote (1920) that input use in crop share land will be lower than in own or leased land (see, e.g., Dubois, 2008)? Empirical results seem to favor this view: Shaban (1987) empirically demonstrated that input use in crop share land was significantly lower than input use in owned land and a priori in fixed rent lands. This is corroborated by Laffont and Matuosi (1995) who show that sharecroppers exert less effort than fixed renters. Obviously, factors other than efficiency are at work to make share or mid-range contracting desirable. Braido (2006) however claims that soil quality must be controlled for as crop share lands are generally of lower quality. When such controls are employed the difference in effort by contract chosen appears to diminish.

D. Gale Johnson (1950) argued that repeated contracting could make the productivity of sharecropped land comparable to that under fixed rent contracts. Cheung (1969), echoing Johnson, argued absent transactions cost sufficient competition will mimic a competitive labor market and thus efficient; but with transactions cost such as effort monitoring share contracts mitigates labor shirking relative to the fixed wage contract (FWC) and allows risk sharing as against fixed rent contracts under output volatility. Hoffman (1984) showed for example that distant lands tend to be leased by fixed rent contracts based on historical data on 83 contracts in 16th century France. Allen and Lueck (1992) also show a higher tendency for share contracts (SC) with lower crop division cost. Transaction cost and agency cost was also the motivation of Roumasset and

Uy (1987) and Roumasset (1995) for SC desirability where agents provide multiple inputs making for high monitoring cost. Multi-task models result in moral hazard associated with substitution of effort across tasks which sharecropping can handle better (Luporini and Parigi, 1996). For Joseph Stiglitz (1974), SC provided the optimal tradeoff between risk sharing and incentives for effort. But evidence for the risk sharing motive itself is empirically mixed (Braido, 2005). Allen and Lueck (1992) using crop variability, viz., corn and wheat, conclude that risk sharing is not compelling motive. Laffont and Matuosi (1995) also claim that tenant's wealth, a proxy for risk aversion, does not figure as determinant in the power of contracts in Tunisia. By contrast, Akerberg and Botticini (2002), by accounting for the endogeneity of contract choice, find a positive correlation between the tenant's contract share and the tenants' wealth in support of the insurance motive assuming that wealth is a good proxy for risk aversion. Dubois (2002) also show that measured risk aversion index correlates positively with lower powered contracts after controlling for the endogeneity of contract choice. Dubois (2002; 2008) following Johnson (1950) and Adam Smith (1776) shows how non-contractible land quality can explain sharecropping when this enters separately into the landlord's utility function. Dubois shows that a fixed rent contract is not optimal even with risk neutral tenant. Limited liability, which motivates the tenant's willingness to take on more risk under a high powered contract, is a possible motive for SC (Shetty (1988). Ghatak and Pandey (2000) combines limited liability and a multi-task feature to show that optimal tenancy contract with joint moral hazard in effort and output risk even without risk neutrality of tenants.

Skill level may be a crucial contract choice factor. Eswaran and Kotwal (1985) deduced SCs where unobserved skills of the players affect output. Muthoo (1998) showed that, starting from moral hazard on the tenant's skill level, no uncertainty and full risk-neutrality, FRCs are best for tenants with high skill level while those with low skills work for SC or FWC in the no-renegotiation regime; FRC is only a possibility absent the no-renegotiation condition. Sen (2011) employed price volatility and imperfect competition in the rural product markets to show that the unique contract type robust to the emergence of third agent competing with the landlord is sharecropping.

Imperfect capital market naturally suggests itself as argument in contract choice. Laffont and Matuosi (1995) showed that the power of the contract in Tunisia is negatively related to the landlord's working capital and positively related to the tenant's working capital. Exogenous influences such as crop volatility appears to factor in as well. Pandey (2000) showed that the noisier the output, the lower is the power of the sharecroppers' contracts. Canjels (1998) showed that the likelihood of a plot being under a SC is positively related to the measured risk. But Allen and Lueck (1999) show that output risk does not have a positive impact on the probability of a crop being leased under sharecropping.

Property rights have surfaced severally in the empirical and theoretical literature. For Laffont and Matoussi (1995), crop sharing might constitute a way for the landlord to extract the tenant's surplus due to, as Braido (2005) put it, "the lack of enforceable mechanisms available to the principal to extract the tenant's surplus." Thus, the landlord's preference for SC hangs on weak enforcement. Security of tenure emerges as explanation for differential investment by tenants in owned versus leased land. That

owned lands are less likely to be subject to expropriation seems to explain more specific investments in owned lands than in leased lands in Pakistan (Jacoby and Mansuri, 2006); Bandiera (2003) shows that fruit trees are more likely to be grown by Nicaraguan farmers in their owned lands than in leased lands for the same reason.

An interesting observation on the literature is that contract choice outcomes tend to be interpreted from the preference of the landlord or principal. But the tenant or agent may also reject a take-it-or-leave-it contract offer opting instead for another contract that, say, improves long-term stability. Banerjee and Ghatak (2004) show that eviction threats or absence of property rights security can induce long-term investment by tenants where long-term investments can stay the hand of the potential evictor. The tack we take here dovetails the Laffont and Matuosi view of the absence of adequate third party mechanism to extract tenant's surplus: in our case, however, it is the tenant's inability to compel the landlord to abide by the contract under weak TPE. The tenant may opt for a contract that shares the bounty of a bumper harvest with the landlord to reduce the likelihood of hold-up by the landlord.

Third party enforcement or public ordering made salient by the work of Douglass North (1990) and Oliver Williamson (1985) though most influential in contract theory in general (see e.g., Glanchant and Brousseau, 2002; Malin and Mortimort, 2002) seems to have been given little explicit role in the sharecropping puzzle. Strong TPE is a canonical assumption of orthodox contract theory and TPE weakness is countenanced only when some contract provision is unenforceable by the TPE. When such is the case, the incentives compatibility constraint is deployed to render the optimal ex-ante contract shirking-free ex-post through the granting of informational rent to the agent. But reneging

or hold-up can also be perpetrated by the landlords who, being normally wealthier, may in fact wield more political influence than a tenant in a locality.

The view of North and Williamson that a good deal of economic underdevelopment in many LDCs can be explained by weak TPE is especially pregnant in the contract space. As North (1994) put it: “The inability of societies to develop effective low cost enforcement is the most important source of both historical and contemporary underdevelopment in the Third World.” Strong TPE allows contracts to navigate the asynchrony in the *quid* and the *quo* of contracts allowing greater contracting options and deeper markets (Williamson, 1983). Weak TPE severely narrows the mid-range contracting space to small coherent groups where threat of penalty is effective. As we will show here, one way it does so is to effectively bar fixed rate contracts.

Weak TPE may be in part due to one of the contractors being himself associated in the contract enforcement. The state which supplies enforcement services in its jurisdiction may for example be also either a principal or a partner in many long-term contracts with the private sector participants. When the state has a weak commitment to the rule of law, it may be unable to resist the popular clamor for change in rules in times a private sector partner is showing profits. This surfaced recently in Metro-Manila, Philippines, where the state regulator of water services, the Metropolitan Water and Services System (MWSS), decided to deny the tariff adjustment petition of the two private water service concessionaires, the Manila Water Company and Maynilad Water Company, on the grounds of a new and different interpretation of the income tax privilege of concessionaires in the governing concession contract. This, it seems upon seeing that the concessionaires have begun showing profits since previous dispensations

did not raise the issue when the concessionaires were still struggling. The concessionaires view this as a violation of the concession contract which, had it been known ex-ante, would have changed their behavior or even deterred them from signing up. The issue is still under dispute (Wallace, 2015) “This gov’t does not honor contracts” Inquirer Opinion, ABS-CBN News, Aug 10, 2015; Philippine Center for Investigative Journalism (PCIJ), July 4, 2013). The behavior of the principal may thus be dependent on the observed outcomes.

The crucial assumption we make here is that the type of the principal/landlord may be endogenous to the realized outcome of the contract and hold-up by the landlord may pay due to weak TPE. This feature of endogenous principal type is in accord with North’s (1994) concept of “evolving mental models” where the behavioral type of players may vary to accord with changing perception of circumstances and information. This is also consistent with new results in cognitive psychology (see e.g., Costa-Gomez and Weizsacker, 2008; Post et al., 2008). Contract theory already allows for multiple behavioral types in the population but each agent has one fixed type. This already allows an average variable, say, quality, to be endogenous which motivates, for example, credit rationing in the Stiglitz-Weiss credit rationing model (1981) where the high interest rate induces the flocking of bad borrowers that raises the risk load of loan portfolios.

In this paper, it is the size of the realized wage that may induce the principal to shift types from abider type to hold-up type. Perhaps closest to this view in incomplete contract theory is the tradeoff between rigidity and flexibility and the Hart and Moore’s (2007) idea of “shading” on effort by parties under different contractual regimes. Sharecropping is flexible as to the returns to the landlord while fixed rent is rigid. In a

fixed rent contract there is no adjusting to the state of nature. This may motivate hold-up by the principal in times of plenty and peasant revolt in times of scarcity (Scott, 1976). In our case however, the choice of ex-ante contract is precisely to avoid costly hold-up.

The power of the contract defined as the degree of responsiveness of the agent's pay to the realized/observed output/revenue is an important concept in contract choice theory. In a pure risk-sharing environment (i.e., with observable effort and random output), the power of the contract is determined solely by the risk attitudes of the principal P and the agent A . When $w'(x) = 1$, we say that FRC solves the optimal contract problem. Thus, under a strong TPE, the contract choice is determined solely by the inherent risk attitudes of players. Under weak TPE, this may no longer be the case.

When TPE is weak and the contract is effort-in-advance, the principal may withhold the future payment. The principal, who delivers his contract obligation last, enjoys what Hume (1769) called the "possession of advantage." This asymmetric empowerment alters the power of the contract.

In this paper, we explicitly imbed the TPE feature in the design of an effort-in-advance adverse selection contracting model general enough to apply to both strong and weak TPE environments. In the latter case, P may benefit by refusing to fully honor the contracted wage, especially in instances when the contracted wage is especially high. Thus, the type of the principal is endogenous to the quality of TPE and the realized outcome. To focus analysis on the adverse selection and the governance angles, we eschew moral hazard.

We show how contracts tend to combine weak TPE with second party provision; in this case, the choice of contract to keep the contract within what Klein (1996) calls

“the self-enforcing range of the contract.” In Section 2, we present as benchmark the familiar P - A model where the type of the principal is fixed and known up to a fixed probability distribution and the implicit underlying TPE is strong. In Section 3, we explicitly imbed a TPE regime in the participation constraint defining along the way weak and strong TPE. To relate the type of the principal with the wage rate, the probability q that the principal abides by the contract is first derived as a positive function of the TPE regime, a negative function of the contracted wage. In Section 4, we first show that the derived general contract nests the familiar textbook optimal contract when TPE is strong. We make a distinction between the inherent risk aversion and the induced risk aversion of the agent and show that the latter exceeds the former only under weak TPE. Thus, the power of the contract is always lower under weak—than under strong—TPE. We then show that a fixed rent contract is never optimal under weak TPE even when the agent is inherently risk-neutral and principal is risk-averse, conditions which normally suffice for a fixed rent contract under strong TPE. The reason is that the agent’s induced risk aversion in weak TPE regimes exceeds zero even as the inherent risk aversion is zero. We summarize in Section 5.

2. The Benchmark Model

In this section, we present the textbook model of optimal contract which will serve as benchmark for our result in the next section. Consider the case of a principal P producing revenue x using the services e of one agent A . Revenue x is a random variable with density function $f(x, e)$, $x \in X$, e is effort and $f' = (\partial f / \partial e) > 0$. Revenue x is costlessly observable ex-post. P ’s utility is $B(\pi)$, $\pi = x - w$, where π is profit, w is the wage of A and

$B' > 0$, $B'' \leq 0$. A 's utility is $U(w(x), e) = u(w(x)) - v(e)$ where $u'(w) > 0$, $u''(w) < 0$ and $v'(e) > 0$, $v''(e) > 0$. A 's reservation utility is U^0 . To isolate the problem of governance, we let e be costlessly observable. The optimal contract $C(w, e)$ solves the problem **P.1** as follows:

$$\begin{aligned} \max_{w, e} \quad & \int B(x - w) f(x, e) dx \\ \text{s.t.} \quad & \int [u(w(x)) - v(e)] f(x, e) dx \geq U^0. \end{aligned} \tag{1}$$

The first order conditions for an interior maximum are:

$$\begin{aligned} \text{(i)} \quad & -B'(x - w) + \lambda u'(w) = 0 \\ \text{(ii)} \quad & B(x - w) + \lambda [u(w) - v'(e)] = 0. \end{aligned} \tag{2}$$

(2)(i) implies that $\lambda > 0$ and the participation constraint (PC) in (1) holds as equality. Combining (2.i) and (2.ii) eliminates λ and generates the efficiency condition which, together with the PC, forms two equations in two unknowns w and e . Solving for w and e gives the optimal risk sharing contract $C(w_0, e_0)$. The cost of the contract to the principal is w_0 .

Differentiating (2.i) with respect to x , substituting for λ and solving for $w'(x)$ gives the standard power of the contract, $w'(x)_0$:

$$w'(x)_0 = R_P(R_P + R_A)^{-1}, \tag{3}$$

where $R_P = (B''/B')$ and $R_A = -(u''/u')$ are Arrow-Pratt measures of absolute risk aversion for P and A , respectively. We will call R_A the *inherent absolute risk-aversion of A* since it is based on A 's utility function alone. $w'(x)_0$ measures the responsiveness of w to actually observed x and $0 < w'(x)_0 \leq 1$. If $R_P = 0$, ($B'' = 0$), and A is risk-averse, then $w'(x)_0 = 0$, so the contract is a fixed wage contract where P bears all and A bears no risk. If $R_P > 0$ and $R_A = 0$, $w'(x)_0 = 1$ and the contract is a franchise or a pure rent contract and A bears all the risk while P bears no risk by receiving a fixed rent.

If $w'(x)_0 > 0$, then part or even the entire wage is necessarily paid after realized x is observed at the end of the cycle. This comes as a share of the surplus or output. As long as part of the payment is delayed till the end of the cycle, it is vulnerable to *ex-post opportunism* since effort e_0 once expended cannot be redeployed and thus has the property of asset specificity.

Suppose the reneging principal pays A not the contracted w^* but something less, w^0 . For example, in a linear effort-in-advance contract, $w = a + bx$, P may withhold bx and A receives only $w^0 = a$. P 's ex-post profit will be higher by bx . The textbook contracting literature says that P will not renege because there is an outside third party that will mete out a penalty $L > bx$ on P with probability one. Thus, effort-in-advance contracts become insulated from ex-post opportunism in a strong TPE environment. Another way of stating this is that strong TPE dissolves the distinction between spot and forward contracts. Unfortunately and especially in developing economies, the enforcement environment is not so reliable as was shown in our example on water concession contracts in Metro-Manila.

3. The TPE Environment

A. Principal Type

Suppose that P has only two options, either to pay the contracted wage w or to pay a fixed $w^0 < w$. The issue is the likelihood that P will renege, i.e., pay only w^0 in a particular TPE environment. If TPE is strong, P will never renege since the subsequent punishment is certain and by definition in excess of opportunism gain. If TPE is weak, P may be tempted to renege if the gain attached to the opportunism is substantial and exceeds the expected penalty. In this case, P 's type is endogenous.

Suppose there are N potential principals producing x using the same technology. Let g be the probability of being punished and $L > 0$ be the statutory penalty attached to P 's reneging on the contract of this type. The typical (see, e.g., Cooter, 1996) expected benefit, Er_i , $i = 1, 2, \dots, n$, from reneging is thus:

$$Er_i = (w - w^0) - gL - A_i, \quad i = 1, 2, \dots, N \quad (4)$$

where $A_i > 0$ is P_i 's *personal conscience cost* of reneging by i , $(w - w^0)$ is the gain from paying w^0 instead of the full w . Suppose A_i is uniformly distributed in the interval $[0, A_0]$ where A_0 is the highest possible conscience cost. Note that P_i abides by the contract if $Er_i \leq 0$ or $A_i \geq (w - w^0) - gL$. The probability that any randomly drawn P_i is an *abider* (i.e., pays the contracted wage w) is, in view of the uniform distribution, $(1 - A_i/A_0) = q$, or

$$q = [A_0 + gL - (w - w^0)]/A_0. \quad (5)$$

Agent A knows A_0 , g , L and w^0 which are public knowledge ex-ante. The interesting aspect is that the likelihood, q , that the principal is an abider depends not only on the TPE

quality, gL , and the inherent rectitude A_0 of the principal but also on contract provision w . It is linear and negative in w . A_0 , the conscience cost of reneging, stands for North's first party enforcement while gL is proxy for North's TPE. The contract structure which is endogenous to TPE is proxy for North's second party enforcement (SPE). The present model thus exhibits interplay between the three Northian enforcement categories in optimal contracts. Note that as A_0 becomes very large, q approaches 1 or the principal is an abider. This may be the case within small coherent groups where hardwired abidance is the norm. The same happens if gL becomes very large. But where these two factors are weak, a rising w can reduce the likelihood of compliance by P .

B. A's Expected Utility

When $q < 1$, the PC of A is

$$\int [qu(w) + (1 - q)u(w^0) - v(e)]f(x, e)dx \geq U^0. \quad (6)$$

The analysis assumes a strictly positive expected marginal utility of w , i.e.,

$$\int [qu'(w) + q'(u(w) - u(w^0))]f(x, e)dx > 0 \quad (7)$$

which, however, is lower than when q is exogenous since $q' \leq 0$. A 's benefit from increased w is tempered by the higher likelihood that P will cross over to being a renegade. Of course, if $q = 1$ and $q' = 0$, (7) reduces to $\int u'(w)f(\cdot)dx$, the familiar textbook expected marginal utility of w to A .

C. Taxonomy of TPE

Definition 1: (i) The TPE environment is strong if $gL \geq (w - w^0)$, that is, if $q \geq 1$ (truncated as $q = 1$) and $q' = 0$; (ii) It is weak if $gL < (w - w^0)$ that is, if $q < 1$ and $q' < 0$.

Remark: (1.i) says that the penalty meted by the TPE for opportunism by P exceeds the gain $(w - w^0)$ from the same act. If TPE is absent ($gL = 0$), $q < 1$ and $q' < 0$.

D. Contract Structure

P now solves the programming problem **P.2**, which maximizes the same objective function as in (1) subject to the new PC given by (6). The first order necessary condition for an interior maximum are:

$$\begin{aligned} \text{(i)} \quad & -B' + \lambda[qu'(w) + q'(u(w) - u(w^0))] = 0 \\ \text{(ii)} \quad & B(x - w) + \lambda(qu(w) + (1 - q)u(w^0) - v') = 0. \end{aligned} \tag{8}$$

Since the expected marginal utility to A of w is always positive by (7), $\lambda > 0$ from (8.i) and the PC binds as equality. Combining (8.i) and (8.ii) gives the efficiency condition which together with the PC can be solved for the generalized optimal contract $C(w^{**}, e^{**})$. If we let $q = 1$ and $q' = 0$, (8) exactly reduces to (2) above and the resulting contracts are identical. Therefore, the contract in (2), $C(w^*, e^*)$, is nested in (8) as a special case when TPE is strong. Likewise, $C(w^{**}, e^{**})$ approaches $C(w^*, e^*)$ in the limit as A_0 approaches infinity, that is, if the conscience cost A_0 of reneging, is infinite. The foregoing shows that the familiar textbook contract is a special case of the contract derived here. We formally state this:

Proposition 1: (i) $(w^{**}, e^{**}) = (w^*, e^*)$ if TPE is strong. (ii) $(w^{**}, e^{**}) \rightarrow (w^*, e^*)$ as $A_0 \rightarrow \infty$.

A multiplicity of types of contract is possible depending on the strength of the TPE. We now explore the implication of weak TPE on the power of the contract. It is easy to show that for a given effort level, the optimal wage w is higher under weak TPE, thus making the contract cheaper for the principal.

4. POWER of the CONTRACT

In this section, we derive the power of the contract under weak TPE as described above. Differentiating (8.i) with respect to x and solving for $w'(x)$ gives

$$w'(x) = R_P[R_P + R_A^0]^{-1} \quad (9)$$

which differs from (3) only with the replacement of R_A by R_A^0 . Now

$$R_A^0 = -(H'' + h')(H' + h)^{-1}$$

where

$$H'' = qu''(w) < 0$$

since

$$H' = qu'(w) > 0,$$

and

$$h' = 2q'u'(w) \leq 0,$$

since

$$h = q'[u(w) - u(w^0)] \leq 0$$

and $q' \leq 0$. Thus, R_A^0 can be viewed as the *induced measure of absolute risk aversion* of the agent. Note that by (7), $[H' + h] > 0$. Note also that if $q' = 0$ ($q = 1$), R_A^0 reduces to R_A in (2). We have the following:

Lemma 1: The *Induced Index of Absolute Risk Aversion* R_A^0 has the following properties: (i) $R_A^0 > R_A$, that is, the induced index of absolute risk aversion of A is higher than the inherent index of absolute risk aversion of A under weak TPE. (ii) $R_A^0 = R_A$ under strong TPE; (iii) $R_A^0 > 0$ under weak TPE even when the agent is inherently risk-neutral ($R_A = 0$).

Proof: (i) The induced absolute risk aversion of A under weak TPE is $R_A^0 = -(H'' + h')(H' + h)^{-1}$. The same under strong TPE is $[-(H'')(H')^{-1}] = [-(u''(w)/u'(w))] = R_A$. But $h' < 0$ under weak TPE and when added to $H'' < 0$ only raises the numerator, while $h < 0$ under weak TPE added to $H' > 0$ reduces the denominator which however remains positive by (7). Thus, $R_A^0 > R_A$. (ii) Under strong TPE both $h, h' = 0$ since $q' = 0$. Thus, $R_A^0 = R_A$. (iii) Suppose A is risk neutral, $u''(w) = 0$, then $R_A^0 = -(h')(H' + h)^{-1} > 0$. In contrast to $R_A = 0$ when $u''(w) = 0$. Thus, $R_A^0 > R_A$ when A is risk-neutral. QED

Proposition 2: (i) $w'(x) = w'(x)_0$, when TPE is strong. (ii) $w'(x) < w'(x)_0$ when TPE is weak.

Proof: (i) If TPE is strong, $R_A^0 = R_A$ from the *Lemma 1* and $w'(x) = w'(x)_0$; (ii) If TPE is weak, $R_A^0 > R_A$, so $w'(x) < w'(x)_0$ by *Lemma 1*. Q.E.D.

Thus, the power of the contract under strong TPE is nested in the power of the contract under the more general model. When A knows that a very generous offer by P (high w) has no effect on the likelihood of contract abidance by P , the power of the contract is unaffected. Otherwise, the power of the contract will respond. Why this happens is of interest. The advantage of a high powered contract is that A shares in high realizations of x . But it is also in those times when the gain from renegeing ($w(x) - w^0$) is higher and the temptation for P to renege is stronger under weak TPE. An instance of induced risk aversion sometimes occurs in the financial sector: when a bank starts to offer abnormally high interest on savings deposits, alert depositors become more vigilant because a default may be in the offing. In effect, A is induced towards more risk aversion. A corollary of (2.ii) is that the combination of inherent risk neutrality in A and strict risk aversion in P under weak TPE do not suffice to make a franchise/fixed rent contract optimal as they do under strong TPE.

Proposition 3: (Sub-optimality of Fixed Rent Contracts Under Weak TPE):

Suppose A is inherently risk-neutral ($u'' = 0$) and P is strictly risk-averse ($B'' < 0$). If TPE is weak, $w'(x) < 1$, the fixed wage contract is never optimal.

Proof: A fixed rent contract under a weak TPE requires $w'(x) = 1$. But by *Lemma* (1.iii), $R_A^0 > 0$ under risk neutrality in A . Thus, $w'(x) < 1$ or a fixed rent contract is never optimal under weak TPE. QED

The more power a contract has, the greater the likelihood of a hold-up by P under weak TPE when the x is large. The temptation to renege is especially great in the fixed rent farm contracts when the harvest is bumper as all the incremental benefits accrues to A and nothing to P . In this case, the tenant or agent insists that the contract gives landlord or principal property rights over a part of the best possible outcome; agent A prefers a contract that divides ex-post rents, as it were, more equitably (Masten, 1988). Similarly this preference for sharecropping keeps the relationship within the self-enforcing range of the contract (Klein, 1996). This also instances what Williamson called *hazard equilibration* (see, e.g., Masten and Saussier, 2000). This helps explain the more widespread adoption of share tenancy not only in the past but also still in the present.

This also calls to mind the trade-off between contract flexibility and rigidity introduced by Hart and Moore (2007) in incomplete contracting. In incomplete contracting, contracts are left purposely incomplete until the required information becomes available in the future. There follows a renegotiation to divide the fruits of non-contractible investments. But due to the sharing ex-post, parties may “shade” on their effort. A SC is flexible, that is, adjusts returns to parties according to the state of nature but the tenant may shade on effort; the fixed rent contract elicits full effort but cannot adjust to the state of nature. In these circumstances, the tenant will either shade on effort under a fixed rent contract to manage a likelihood of hold-up and recontracting or ex ante choose the SC to attain the same thing—keep the contract within the self-enforcing range. This strategy prevents costly hold-up and recontracting.

The application of the view herein proposed naturally goes beyond agriculture. This may also explain the dominance of large politically connected enterprises (*The*

Economist, 2001, “In Praise of Rules,” Survey of Asian Business). Weak TPE or alternatively weak rule of law means a constant threat of adverse changes in rules by the state when business is booming. Connected dealings, like a SC, makes the political establishment a party to the bounty and thus eases the threat. The phenomenon of large businesses in many LDCs having either direct or indirect—and many times, elicit connected dealings with the political establishment—may be viewed from this lens as a form of an implicit SC where the political establishment, in exchange for the connected flows, protects the firm from outright expropriation by the state when profit is high. Truly unconnected and rules-based large private businesses—especially those involved with basic services such as water and power—run the constant risk of expropriation by rules change. Only when states have demonstrated credible commitment to the rule of law do truly unconnected firms become viable. The parliamentary control of government finances in England (North and Weingast, 1989) was an example of such credible commitment. This rendered market players comfortable enough not only to extend long term loans to the sovereign but also to increasingly own and run unconnected large independent enterprises.

5. Conclusion

Why are FRCs less prevalent than SCs despite the superior efficiency attached to the former? One reason among others is that under weak TPE, the agent or tenant tries to reduce the risk of contract reneging by the principal/landlord in times of bumper harvest to which the landlord has no claim under FRC. A SC does this. We show this by considering an adverse selection effort-in-advance principal-agent contract where the

type of the principal is endogenous to contract terms and the quality of TPE. The probability that the principal will renege rises with gain from reneging which rises with the bumper harvest. We formally characterize strong TPE as one that eliminates the possibility of ex-post opportunism through the certainty of penalty in excess of the gains from reneging. Weak TPE in contrast leaves room for profitable reneging. When TPE is strong, the optimal contract in this model is identical to the familiar textbook principal-agent contract. Thus, the textbook optimal contract model is nested in the more general model presented here. They differ markedly when TPE is weak. One difference is in the power of the contract.

The paper first deduces the likelihood that the principal will cross over from abider to renegade. This likelihood displays an interesting interplay between the three Northian enforcement categories in the contracting space: first party, second party and third party enforcement. This likelihood rises with the gain from reneging which rises with the contracted wage rate. This in turn induces a risk aversion in the agent in excess of his inherent risk aversion. This impacts the power of the contract. A contract has more incentive power when A 's pay is more closely tied to the outcome x . But if high w due to high x also raises the risk of reneging by P , it is less desirable even to a risk neutral A . We show that the power of the contract under weak TPE is always less than the power of the same contract under strong TPE. In particular, a fixed rent contract is never optimal even when the principal is risk-averse and the agent inherently risk neutral. When the harvest is bumper, the income of the agent from the output under a fixed rent contract spikes and to which P has no claim. The high return to reneging will tempt the principal to break the contract and appropriate part of the bumper harvest for himself. Where third party

enforcement is weak (the principal may sometimes himself be the contract enforcer, as in a feudal regime), this contract type will be avoided.

Weak TPE has been implicated as culprit in the poor performance of economies. Here, we suggest two pathways by which market is fettered and poor performance is induced by weak TPE. First of all, certain contracts (e.g., the fixed rent contracts) become barred even when efficient for risk sharing under strong TPE. Thus, weak TPE induces a shallow market among large heterogeneous populations. Second, the cost of contracts for upright principals (those with very high A_0 and have no intention to renege) rises. In markets where abiders and renegers compete, the abiders will be selected for extinction. Thus, the weak TPE also acts as a selection mechanism for poor quality principals and poor outcomes.

References

- ABS-CBN News (PHL). August 10, 2015. Water income tax dispute subject to arbitration. *Philippine Center for Investigative Journalism* (PCIJ), July 4, 2013.
- Ackerberg, Daniel A. and Maristella Botticini. 2002. Endogenous matching and the empirical determinants of contract form. *Journal of Political Economy* 110 (3), 564-591.
- Allen, Douglas W. and Dean Lueck. 1992. Contract choice in modern agriculture: Cash rent versus cropshare. *Journal of Law and Economics* 35 (2), 397-426.
- Allen, Douglas W. and Dean Lueck. 1999. The role of risk in contract choice. *Journal of Law, Economics and Organization*, vol. 15(3), 704-36.
- Bandiera, Oriana. 2003. Contract duration and investment incentives: Evidence from land tenancy agreements. Mimeo, London School of Economics.
- Banerjee, Abhijit and Maitreesh Ghatak. 2004. Eviction threats and investment incentives. *Journal of Development Economics* 74 (2), 469-488.
- Braido, Luis H.B. 2005. "Insurance and incentives in sharecropping," in P. Chiappori and C. Gollier (eds), *Insurance: Theoretical Analysis and Policy Implications*. MIT Press, Cambridge, MA.
- Braido, Luis H.B. 2006. "Insurance and Incentives in Sharecropping," in P. Chiappori and C. Gollier (eds), *Competitive Failures in Insurance Markets*. MIT Press, Cambridge, MA.
- Brousseau, E. and J.M. Glanchant, 2002. "The economics of contracts and the renewal of economics," in E.E. Brousseau and J.M. Glanchant (eds.). *The Economics of Contracts: Theories and Applications*. Cambridge University Press, Cambridge.
- Canjels, Eugene. 1998. Does risk affect the choice between share and fixed rent contracts? Mimeo, New School University.
- Cheung, Steven N.S. 1969. Transaction costs, risk aversion, and the choice of contractual arrangements. *Journal of Law & Economics* 12 (1): 23-42.
- Cooter, R. 1996. "The rule of state law and the rule-of-law state: Economic analysis of the legal foundations of development," in Bruno, M. and B. Pleskovic (eds.), *Annual World Bank Conference on Development Economics*. The World Bank, Washington DC.
- Costa-Gomez, M.A. and G. Weizacker. 2008. Stated beliefs and play in normal form games. *The Review of Economic Studies* 75 (3), 729-762.
- Dubois, P. 2002. Moral hazard, land fertility and sharecropping in a rural area of the Philippines. *Journal of Development Economics* 68, 35-64.
- Dubois, Pierre. "Sharecropping." *The New Palgrave Dictionary of Economics*, second edition. Eds. Steven N. Durlauf and Lawrence E. Blume. Palgrave Macmillan. The New Palgrave Dictionary of Economics Online. Palgrave Macmillan. 18 November 2008.

Eswaran, Mukesh and Ashok Kotwal. 1985. A theory of contractual structure in agriculture. *American Economic Review* 75: 352–367.

Ghatak, M. and Pandey, P. 2000. Contract choice in agriculture with joint moral hazard in effort and risk. *Journal of Development Economics* 63, 303-26.

Hart, Oliver and John Moore. 2007. Incomplete contracts and ownership: Some new thoughts. *American Economic Review* 97(2), 182-186.

Hoffman, Philip T. 1984. The economic theory of sharecropping in early modern France. *Journal of Economic History* 44 (2), 309-319.

Hume, David. 1978 [1740, 1888]. A treatise of human nature. L.A. Selby-Bigge (ed.). Revised 2nd edition by P. Nidditch. Clarendon Press, Oxford.

Jacoby, Hanan and Ghazala Mansuri. 2006. Incomplete contracts and investment: A study of land tenancy in Pakistan. World Bank Policy Research Working Paper 3826, February 2006.

Johnson, D. Gale. 1950. Resource allocation under share contracts. *Journal of Political Economy* 58 (2), 111-123.

Klein, B. 1996. Why hold-up occur: the self-enforcing range of contractual relationships. *Economic Inquiry* 34:444-463.

Laffont, Jean-Jacques and Mohamed S. Matoussi. 1995. Moral hazard, financial constraints and sharecropping in El Oulja. *Review of Economic Studies* 62(3), 381-399.

Luporini, A. and Parigi, B. 1996. Multi-task sharecropping contracts: the Italian Mezzadria. *Economica* 63, 445–57.

Malin, Eric and David Mortimort, 2002. Transaction Costs and Contract Theory. Paper provided by HAL in its series Post-Print with number halshs-00440475.

Marshall, Alfred. 1920. Principles of economics (8th ed.). Macmillan and Co., Ltd., London.

Masten, Scott E. 1988. Minimum bill contracts: theory and policy. *Journal of Industrial Economics*, vol. 37(1), 85-97.

Masten, Scott E. and Stéphane Saussier. 2000. Econometrics of contracts: An assessment of Developments in the empirical literature on contracting. *Revue d'Économie Industrielle, Programme National Persée*, vol. 92(1), 215-236.

Mill, John S. 1848. Principles of Political Economy. Edited by W. J. Ashley, Longmans Company, London (1936).

Muthoo, Abhinay. 1998. Renegotiation-proof tenurial contracts as screening mechanisms. *Journal of Development Economics* 56: 1–26.

North, D. 1990. Institutions, institutional change and economic performance. Cambridge University Press, Cambridge.

North, D. 1994. Economic performance through time. *The American Economic Review* 84, pp. 359-368.

North, D. and B. Weingast. 1989. Constitutions and commitment: The evolution of institutions governing public choice in 17th century England,” *Journal of Economic History* 1993, pp. 51-69.

Pandey, Priyanka. 2000. Contract choice in agriculture with joint moral hazard in effort and risk. *Journal of Development Economics* 63(2): 303-326.

Post, T, Van den Assem M J, Balthussen G and R H Thaler. 2008. Deal or no deal? Decision making under risk in a large payoff game. *The American Economic Review*, 38-71.

Roumasset, James and Marilou Uy. 1987. Agency costs and the agricultural firm. *Land Economics* vol. 63(3), 290-302.

Roumasset, James. March 1995. The nature of the agricultural firm. *Journal of Economic Behavior & Organization* 26 (2): 161-177.

Scott, James. 1976. The moral economy of the peasant: Rebellion and subsistence in Southeast Asia. Princeton University Press: Princeton, New Jersey.

Sen, Debapriya. 2011. A theory of sharecropping: the role of price behavior and imperfect competition. *Journal of Economic Behavior & Organization* 80 (1):181–199.

Shaban, Radwan Ali. 1987. Testing between competing models of sharecropping. *Journal of Political Economy*, vol. 95, no. 5 (October 1987), pp. 893-920.

Shetty, Sudhir. 1988. Limited liability, wealth differences, and the tenancy ladder in agrarian economies. *Journal of Development Economics* 29: 1-22.

Smith, Adam. 1776. An inquiry into the nature and causes of the wealth of nations. Edited by Edwin Cannan, University of Chicago Press, Chicago.

Stiglitz, Joseph. 1974. Incentives and risk sharing in sharecropping. *The Review of Economic Studies* 41 (2): 219–255.

Stiglitz, Joseph and Andrew Weiss. 1981. Credit rationing in markets with imperfect information. *The American Economic Review* 71, no. 3, 313-333.

Wallace, P. December 29, 2015. This government does not honor contracts, Inquirer Opinion, ABS-CBN News, Aug 10, 2015; *Philippine Center for Investigative Journalism* (PCIJ), July 4, 2013.

Williamson, Oliver. 1983. Credible commitments: Using hostages to support exchange. *American Economic Review* 73, pp.519-540.

Williamson, Oliver. 1985. The economic institutions of capitalism: Firms, markets, relational contracting. The Free Press, New York.