Decoupled Programs, Payment Incidence, and Factor Markets: Evidence from Market Experiments

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Title

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Abstract

We use laboratory market experiments to assess the impact of asymmetric knowledge of a per-unit subsidy and the effect of a decoupled annual income subsidy on factor market outcomes. Results indicate that when the subsidy is tied to the factor as a per-unit subsidy, regardless of full or asymmetric knowledge for market participants, subsidized factor buyers distribute nearly 22 percent of the subsidy to factor sellers. When the subsidy is fully decoupled from the factor, as is the case with the annual payment, payment incidence is mitigated and prices are not statistically different from the no-policy treatment.

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Subsidies designed to transfer income to agricultural producers have received increased scrutiny given global trade rules agreed to in the Uruguay Round Agreement on Agriculture (Bhaskar and Beghin 2009; Coble, Miller and Hudson 2008). Researchers have addressed how alternative subsidies may impact agricultural production decisions and the associated commodity markets, but have focused less attention on potential distortions to factor markets (Phillips et al. 2010). It is common knowledge that traditional agricultural subsidies, such as target-price deficiency payments, are passed on to landowners via higher rents and capitalized into land prices (Goodwin, Mishra and Ortalo-Magne 2003; Lence and Mishra 2003; Weersink et al. 1999). This phenomenon is often referred to as payment incidence. But, what are the effects of a decoupled-income subsidy on land values and rental rates? It is possible that the less connected subsidies are to crop prices and production levels, the less capitalized the subsidy may become in factor markets such as land. Bhaskar and Beghin (2009) indicate that existing policies deemed acceptable by World Trade Organization standards still can have a large impact on land values and rental rates causing allocative inefficiencies, suggesting decoupled policies may have indirect impacts in factor markets.

Research regarding estimation of the rate of payment incidence in land markets has indicated a wide variation in percentage of a subsidy paid to tenant producers that is passed on to landowners. Predictions from theoretical models indicate all of the subsidy should go to landowners given an inelastic supply of land (Schmitz and Just 2002; Schultze 1971). Barnard et al. (2001) find empirically that subsidies account for up to 24 percent of farmland market values

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in the Heartland region of the Midwest. Roberts, Kirwan, and Hopkins (2003) use micro data from 1992 and 1997 from the *U. S. Census of Agriculture* and report that in 1997 land rents increased from between $0.33 and $1.55 for each dollar of government payment. Kirwan (2009) econometrically estimates the average payment incidence in farmland rental markets at 20 to 25 percent going to the landlord, and the author suggests this could be related to the imperfectly competitive nature of agricultural land rental markets. Kirwan goes on to suggest payment incidence could also be impacted by social norms or fairness but is unable to test this hypothesis given the nature of the data used in his analysis.

We believe economic experiments can help explain the incidence theoretical anomaly; specifically we look at the role of market and other-regarding behavior. The objective of our research is to not only provide a point estimate of payment incidence, but also to explore factors contributing to this incidence and to test the payment incidence of alternative policies. We believe our research may be applied to policy design and improve allocative efficiencies across agricultural product and factor markets.

Two interesting questions arise from the payment incidence literature. First, why does payment incidence exist if market participants exhibit self-interest? Second, can income transfer mechanisms be decoupled to create little or no distortion in related factor markets? To answer such questions, alternative policies need to be tested. A major obstacle to research assessing the impacts of agricultural policies *ex ante* is the lack of adequate data when programs have not been implemented. Another is the difficulty in identifying a standard against which to compare observed market outcomes, such as a baseline, no-policy comparator. These obstacles limit the application of traditional econometric methods in analyses of policy alternatives *ex ante*. A third obstacle lies in controlling for unobserved factors that may seriously impact econometric results

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even if data for a policy study exist, making it difficult to interpret policy impacts *ceteris paribus* and their potential causes (Roberts, Kirwan and Hopkins 2003).

We use laboratory market experiments to test participant self-interest. We accomplished this by designing experiments to assess whether asymmetric knowledge of a subsidy will impact bargaining behavior and the resulting payment incidence. That is, is payment incidence related to common knowledge that either the buyer or seller receives a subsidy, thereby inducing bargaining behavior that distributes part of the subsidy to both sides of the market? Second, we test a decoupled-income subsidy alternative on factor market outcomes such as negotiated price or land rental values. We believe this research should contribute to an understanding of the phenomenon of payment incidence and improve decoupled policy design.

Background and Motivation

Decoupled Programs

Bhaskar and Beghin (2009) review the literature regarding decoupled programs and focus their survey of the literature on analyses of farm programs of the last ten years. These include production flexibility contract (PFC) payments from the 1996 Federal Agriculture Improvement and Reform (FAIR) Act that were continued under the 2002 Farm Security and Rural Investment (FSRI) Act and counter-cyclical payments (CCPs) in the United States. They conclude that such programs are coupled indirectly as they "potentially have some allocative effects due to uncertainty, imperfect credit, land and labor markets, and farmer expectations" (p. 132).

Even though the direct PFC payments and later CCPs implemented under the FSRI Act were not directly tied to production and prices, these programs were related to the historical crop acreage. Coble, Miller, and Hudson (2008) analyze a survey delivered by the National Agricultural Statistics Service in Mississippi and Iowa during the spring of 2005. These authors

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conclude that producers have an incentive to think about current production decisions and how they may impact future farm program benefits. Such results suggest subsidies connected to the land base may not be as "decoupled" as originally desired by policy makers.

Given the literature indicates current or traditional programs may not be fully decoupled, *ex ante* analyses of other potential policies is warranted. Bastian et al. (2008), in a laboratory market, test the impacts of a decoupled bond scheme that transfers income to sellers as a lump-sum or periodic (annual) payment regardless of the production decision as compared to no policy and a stylized coupled target-price deficiency payment program. The authors find that the target-price program resulted in the lowest price and highest quantities produced as compared to switching to one of the decoupled programs. Prices for the decoupled programs were slightly lower than the no-policy treatment but, as expected, they were higher than the coupled program. Moreover, quantity levels were equal to or near no-policy levels for the decoupled programs. They conclude there is a moral-hazard-like issue when sellers negotiate market prices after receiving a subsidy (that is, sellers are less aggressive at garnering high bid prices when they receive a subsidy), but that decoupled programs are more efficient at transferring income to producers with the least quantity distortion compared to the coupled program.

Phillips et al. (2010) investigate alternative target-price levels in addition to lump-sum and annual payment schemes as income transfer mechanisms for commodity sellers across seller-only and posted-bid institutions. These authors conclude the moral hazard issue is the worst for the coupled program as price levels approach predicted Cournot levels for the higher target price level tested. As a result, the distribution of earnings between buyers (agribusiness) and sellers (agricultural producers) is impacted. Quantity distortion was least for the lump-sum income

transfer mechanism. They also indicate that the literature would benefit from analyses related to the impact of bond scheme type programs on factor markets such as land.

Overall, the literature indicates current payment programs, thought to be decoupled, may in fact not be fully decoupled as they may induce indirect effects. One indirect effect that has the potential for causing distortion is payment incidence and the resulting potential allocative inefficiency caused in land markets. Experimental evidence suggests decoupled policies that transfer income to commodity sellers as a lump-sum or annual payments not tied to production or price create fewer direct market impacts or distortions related to production (Phillips et al. 2010; Nagler et al. 2009; Bastian et al. 2008). There, however, is some indication that sellers are willing to negotiate lower market prices thereby benefiting buyers even when the subsidies are "decoupled." Moreover, the impacts of these types of decoupled programs on factor markets are not fully understood.

Self-interest

The above discussion indicates there may be a moral hazard-like phenomenon related to commodity sellers' market behavior when they receive a subsidy and negotiate for commodity trade prices. This result suggests self-interest and individual wealth maximization may not be the only motivation for behavior, even in a competitive market setting. The reported literature, however, offers little insight as to why we might see payment incidence in factor markets such as is seen in land markets. Laboratory market experiments offer a way to isolate and test factors impacting market negotiations and payment incidence phenomena.

If self-interest were the primary motivator of producers renting land, the expectation would be that tenant producers renting land should not be willing to bargain away any of the subsidy they receive to landowners. On the other hand, given landowners have knowledge that

producers receive a subsidy for their production from the land, self-interest may induce

landowners to bargain for prices higher than what the income potential from production alone

might dictate. As potential evidence of this, Roth (1995) indicates that in many bargaining

situations participants often bargain toward a 50/50 split of the available surplus. Moreover,

Kirwan (2009) suggests that neoclassical theory, assuming an inelastic supply of land and a

perfectly competitive market, predicts landowners would capture the entire subsidy from tenants.

Thus, neoclassical-based expectations seem to offer a broad range of potential market outcomes

associated with land rental negotiations impacted by a subsidy.

Fairness and Other-regarding Behavior

Another possible explanation for the payment incidence is that of fairness or generosity as a

behavioral motivator when the producer and landowner bargain for rental price. Kahneman,

Knetsch, and Thaler (1986) propose that firm profit-maximization is subject to a fairness

constraint, in addition to traditional resource constraints. Fehr and Schmidt (2006) review the

experimental and psychological literature and conclude there is overwhelming evidence that

what is referred to as other-regarding behavior strongly motivates many people as it relates to

distributing surplus. They report results across numerous experiments and find other-regarding

behavior is prevalent across students and non-students, as well as across cultures and stake or

surplus levels. Thus, market participants may simply feel it is more fair to split at least some of

the subsidy available to one side of the market (tenant producers in the case of land), thereby

contributing to payment incidence during negotiations.

Given these potential causes of payment incidence, researchers must determine whether

steps can be taken to reduce the allocative inefficiencies associated with policies designed to

transfer income to producers. The broad literature associated with bargaining and other-regarding

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behavior suggests many avenues of research may exist to study the payment incidence phenomenon. Surprisingly, few examples of testing other-regarding behavior exist in market experiments, however, as most other-regarding behavior experiments have focused primarily on variations of the ultimatum, gift exchange, power-to-take, and third party punishment games (Fehr and Schmidt 2006).

Research Questions and Methodology

From the above, relevant questions include: Does knowledge of the subsidy impact bargaining outcomes given self-interest or is payment incidence related to other-regarding behavior?; Can policy design mitigate the potential allocative inefficiencies associated with payment incidence even in the face of self-interest or other-regarding behavior? We propose the use of market experiments as an appropriate methodology to address these issues. We first design a "partially decoupled" per-unit subsidy in the sense that it is tied to the unit being traded (that is, tied to the factor), but it is not connected to a commodity production decision on the land unit being traded. We then test if full or asymmetric knowledge of the per-unit subsidy impacts potential payment incidence. We believe these treatment results will discern if payment incidence is related to self-interested bargaining behavior or other-regarding behavior. We then test whether changing to a subsidy "fully decoupled" from the factor mitigates payment incidence. We use decoupled subsidies similar to those tested in the literature (Bastian et al. 2008; Phillips et al. 2010).

Conceptual Framework

A conceptual framework for our proposed research is illustrated in figure 1. This conceptual framework outlines the essential elements and variables of interest for the experimental design. As previously discussed, subsidy mechanisms, both coupled and decoupled from the factor, may interact with a behavioral filter that distinguishes between self-interest and other-regarding

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behavior during private negotiation of factor rental agreements. Two resulting outcomes could occur from this interaction. One outcome would be that of a well-functioning factor market that signals efficient allocation of resources. Another outcome could be one in which a market distortion, such as payment incidence, provides market signals that result in inefficient resource allocation. In our market experiments we intend to assess the potential impact of the behavioral filter (self-interest versus other-regarding behavior) via information treatments (full versus private information). If self-interest were the primary motivator of participants in land rental markets, the expectation would be that tenant producers renting land should not be willing to bargain away any subsidy to landowners. Another possible explanation for payment incidence is that of fairness or generosity as a behavioral motivator when the producer and landowner bargain for rental price. We will test whether the presence of full information regarding the subsidy received by land renters impacts bargaining behavior and the resulting market outcomes. Outcomes from our market experiments include price, number of trades, and buyer and seller earnings.

Testable hypotheses include:

Hypothesis 1 - Ho: Information (full versus asymmetric information) does not impact market outcomes or payment incidence.

Hypothesis 2 - Ho: Subsidy type (per-unit versus annual or periodic subsidy) does not impact market outcomes or payment incidence.

Methods and Procedures

A private negotiation, laboratory market with production-to-demand or forward delivery was designed to assess the impact of subsidies paid to tenant producers in a land rental market. Experimental procedures follow standard practices (Friedman and Sunder 1994; Davis and Holt

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1993) and related previous research (Menkhaus et al. 2007; Menkhaus et al. 2003). Design

considerations including induced-value performance, anonymity, standardized recruitment, and

laboratory procedures were considered to minimize subject bias when designing experimental

methods and procedures.

Experimental Market and Treatment Design

A market consists of a trading institution and method of delivery. The trading institution defines

the rules by which buyers and sellers interact and arrive at trades. Private negotiation is the

relevant trading institution in agricultural land rental markets. In private negotiation two agents,

a buyer and a seller, make offers and counteroffers until there is agreement on price and other

contractual arrangements. Two methods may be used in delivery of goods traded: advance

production or forward delivery. In advance production sellers enter a market with inventory in

stock, incurring sunk costs before sales. In a forward market transaction, price and quantity are

agreed upon before production. In the land market, sunk costs associated with advance

production (and their resulting risks and incentives) are not relevant. A forward delivery market

is therefore used in the market design.

Four agricultural policy and information treatments are investigated. The first is a market

in which no support is paid out. This "no subsidy" or base treatment allows for comparison of

how the market might be impacted by government intervention. In the second treatment, buyers

(land renters) received a per-unit subsidy of 20 tokens in addition to their market profits on each

unit they purchased and both buyers and sellers were made aware of this subsidy during the

instructions (full information). This treatment captures other-regarding behavior or

fairness/generosity as it relates to distribution of the subsidy. In the third treatment, buyers again

receive the per-unit subsidy (and received private information to this effect) but sellers were *not*

told via instructions (had "no common knowledge" – asymmetric information) that buyers would receive an additional 20-token payment on each unit traded. In the fourth treatment, buyers (tenant producers) are subsidized with a periodic "annual" payment of 100 tokens per trading period and both buyers and sellers are made aware of this subsidy during the instructions (full information).[1]

Laboratory Procedures

Experimental sessions occurred in an experimental economics laboratory using a computer network. University students were recruited to participate, mainly from business and economics classes. Participants were paid a $10 show-up fee in addition to earnings generated via trading in the market. Earnings were denoted in a monetarily-convertible currency referred to as tokens (one token equaled one cent). Market earnings accumulated during the sequence of trading periods and token earnings were cashed in at the end of the experiment. Average market earnings, paid to participants in addition to show-up fees, were $27 for sessions that lasted about an hour and a half.

Each experimental session began with a standard presentation of instructions followed by one or more practice sessions (using different unit costs and values than in the primary experiment). At the beginning of each trading period four buyers and four sellers were randomly paired to negotiate prices and sequentially trade up to eight units over three one-minute bargaining rounds. Random pairing controls for the confounding effects reputation can have on outcomes. Before trading began each buyer was given a private table of unit redemption values for eight units and each seller was given a table of unit costs for eight units. Redemption values started at 130 tokens for the first unit and decreased by ten to 60 tokens for the eighth unit; costs began at 30 tokens increasing by ten to 100 tokens. As trades were made buyers earned the

difference between the redemption value for the unit traded and the negotiated price; sellers earned the agreed price minus their unit cost. At the end of the trading period each participant's earnings was privately displayed, after which a new period began. Each session consisted of 20 or more trading periods. In order to avoid strategic behavior in the final round(s), participants did not know when the experimental session would end.

Individual and aggregate unit cost and unit redemption value schedules are step functions following Davis and Holt (1993, pp. 9–14). Summing the aggregate supply (cost) and demand (redemption value) relationships results in induced supply and demand from which equilibrium market outcomes are predicted. The predicted equilibrium price is 80 tokens, quantity (trades) is between 20 and 24 units, and relative earnings are 150 tokens per buyer and seller in a market with four buyers and four sellers not including potential subsidy income.

Analysis

Data were analyzed using a convergence model. The following general convergence model (1), based on those developed by Ashenfelter et al. (1992) and Noussair, Plott, and Riezmen (1995), was estimated to describe the data and allow for statistical comparison:

$$Z_{it} = B_0\big[(t-1)/t\big] + B_1(1/t) + \sum_{j=1}^{i-1} \alpha_j D_j\big[(t-1)/t\big] + \sum_{j=1}^{i-1} \beta_j D_j(1/t) + u_{it'} \tag{1}$$

where Z_{it} is the market outcome of interest, such as average sale price (or units traded or earnings) across replications and all trades for each of t periods (1, ... , 20) in cross section (treatment) i; B_0 is the predicted asymptote and B_1 is the starting level of the dependent variable for the base treatment; α and β are, respectively, adjustments to the asymptote and starting level for each treatment's relation to the base; D_j is a dummy variable separating j treatments; and u_{it} is an error term. The Parks method (1967; SAS 2008, pp. 1300-1302) was used to estimate the model as it accounts for unique statistical properties resulting from the panel data sets. Analyses

were conducted in SAS using the PANEL procedure, and tests across treatments are evaluated by testing potential differences in asymptote convergence levels (SAS 2008, Chapter 19). The t-test used to infer differences between convergence estimates assumes a normally distributed sample (Neter, Wasserman and Kutner 1985); the distribution of residuals for each market outcome was tested using standard normality tests (Steel and Torrie 1960). The normality assumption was met in all cases. Three replications were conducted for each of the four treatments described above. The data represent averages for each trading period across these replications.

Market Results

A summary of experimental results can be found in table 1 which includes parameter estimates and statistical tests from the convergence analysis for all market outcomes.

Price

Negotiated prices in the base market with no subsidy paid out converged at 81.6 tokens, just above the predicted equilibrium of 80 tokens. When a periodic "annual payment" known to all participants was paid to buyers prices converged at 79.5 tokens, below but not significantly different from the base/no-subsidy treatment. With a known 20-token per-unit subsidy paid to buyers in the market on each unit they purchased, prices rose significantly, converging at 86.0 tokens (table 1). This increase indicates a significant portion of the subsidy was passed to the seller via market negotiations. Average prices rose 4.4 tokens when the 20-token coupled payment was made to the buyer, resulting in a pass-through rate of 21.8 percent.[2] Thus, our null hypothesis (H_O 2) regarding subsidy type is rejected, suggesting subsidy type does matter. With asymmetric knowledge, that is when sellers were not told of the buyer per-unit subsidy, average prices converged at 85.9 tokens (table 1). This average price is not significantly different from the market when the per-unit subsidy was known to all participants. This suggests that even

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with asymmetric information, factor buyers were willing to offer some of the per-unit subsidy to factor sellers. We cannot reject our null hypothesis (H$_O$ 1) regarding information treatment. Overall, we believe this points to other-regarding behavior as a possible explanation for payment incidence.

Trades

Trading levels in all treatments were below the predicted equilibrium of 20 to 24 units per period. This is expected given limited matches and private negotiation as the market institution (Menkhaus et al. 2007). The number of trades per period converged at 16.6 in the no-subsidy treatment. A known annual payment and per-unit subsidy paid to buyers resulted in trading levels significantly above the base at 17.7 and 17.4, respectively, with no difference between the subsidy types (table 1). When sellers had no knowledge of the per-unit subsidy paid to buyers, trades converged at 18.0 per period—not significantly different from the known annual and per-unit treatments (table 1). Overall, these results suggest subsidy type seems to impact price (and the resulting payment incidence), but it does not impact quantity traded.

Earnings

Average seller earnings in the base/no-subsidy treatment converged at 140.5 tokens per period. With a known annual payment given to buyers, seller earnings (139.2 tokens) were not significantly different from the base. This is consistent with expectations given observed price and trade levels for these treatments. A per-unit subsidy, known to sellers, however, resulted in significantly higher seller earnings—converging at 167.5 tokens per period (table 1). When sellers were unaware of the per-unit buyer subsidy their earnings increased slightly, but not significantly, to 169.5 tokens per period (table 1). Again these results suggest subsidy type does matter, and information does not impact bargaining outcomes given the per-unit subsidy.

Buyer's market earnings—not including subsidy payments—were lower than seller earnings in every treatment. Average buyer earnings converged at 126.4 tokens per period with no subsidy in the market. A known annual payment to buyers resulted in slightly but not significantly higher earnings, converging to 136.9 tokens per period (table 1). Unsubsidized market earnings for buyers were lowest when they were paid a per-unit subsidy on each unit purchased which was known to sellers in the market, with earnings converging significantly below the base at 102.9 tokens per period. This reflects decreased earnings for buyers associated with higher prices and similar quantities traded. When the same subsidy was not known to sellers in the market, buyer earnings did not change significantly: asymmetric knowledge per-unit subsidy earnings for buyers converged at 109.2 tokens per period (table 1). These results overall suggest that distribution of earnings generally favors sellers when the subsidy is coupled to the factor and results in higher prices and payment incidence.

Conclusions

Regardless of whether or not both sides of the market were aware of the per-unit subsidy tied to the factor, buyers negotiated higher prices and shared surplus with sellers. Moreover, the payment incidence level of nearly 22 percent was similar to levels of payment incidence found in the literature. This payment incidence was true across both information treatments suggesting that other-regarding behavior may be impacting payment incidence rather than self-interest in bargaining behavior.

When the subsidy is viewed by participants as being attached to the factor, buyer participants behave as if it is more "fair" to pass some of the subsidy on to the factor seller. Interestingly, once the subsidy is not attached to the factor, factor buyers do not share part of subsidy. This detachment of the subsidy from the factor or surplus to be bargained for is a

marked departure from much of the literature investigating other-regarding behavior. Moreover, these results offer some insights into possible explanations behind payment incidence that augment conclusions by Kirwan (2009) and the potential to design policies that reduce the allocative inefficiencies associated with this phenomenon.

The results indicate that policy design can mitigate payment incidence, regardless of potential motivations related to other-regarding behavior, thereby reducing direct factor market distortions and allocative inefficiencies. Even in the face of full knowledge, when the subsidy is fully decoupled from the factor, such as the stylized annual payment bond schemes tested here, payment incidence is mitigated. This suggests that income transfer mechanisms can be designed that create less allocative inefficiencies associated with payment incidence in land markets. Policies designed to be fully decoupled from both commodity production and related production factors will have less direct distortionary impacts across both commodity and factor markets. It is important to note that this research does not address other potential indirect effects that may arise from decoupled subsidy programs as discussed by Bhaskin and Beghin (2009). Moreover, our results suggest additional research investigating the potential of other-regarding behavior as a motivator for payment incidence could make an important contribution. Despite these limitations, we believe this research offers an important contribution and also points toward the use of experimental techniques for *ex ante* policy analyses.

Endnotes

[1] It was not necessary to test information asymmetry for this subsidy type given results indicated that even in the face of full information payment incidence did not occur.

[2] The incidence or pass-through rate is calculated as the difference between the converged average price for subsidized and unsubsidized treatments divided by the subsidy per unit: 85.98 - 81.63) / 20 = 0.218 or 21.8 percent. In related research, we find that an experiment with agricultural professionals using the same design as for student participants results in an identical payment incidence, although different price and trade levels were observed.

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Table 1. Convergence Estimates and Tests for Significance between Market Outcomes

Treatment	Price	Trades	Seller Earnings	Buyer Earnings*
No Subsidy	81.6[a]	16.6[a]	140.5[a]	126.4[a]
Annual Payment, Common Knowledge	79.5[a]	17.7[b]	139.2[a]	136.9[a]
Per-Unit Subsidy, Common Knowledge	86.0[b]	17.4[b]	167.5[b]	102.9[b]
Per-Unit Subsidy, Asymmetric Knowledge	85.9[b]	18.0[b]	169.5[b]	109.2[b]

[a..c] Different letters in a column indicate significant difference between convergence levels at a 95% significance level.

* Buyer earnings are market earnings and do not include subsidy amounts.

Normal distribution of residuals was confirmed for all market outcomes using a Shapiro-Wilk test for normality at a 99% confidence level.

Figure 1. Conceptual Framework

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                    ┌─────────────────┐
                    │     Subsidy     │
                    │    Mechanism    │
┌──────────────────┐└─────────────────┘┌──────────────────┐
│ Decoupled from   │                   │ Coupled to Factor│
│     Factor       │                   │                  │
└──────────────────┘                   └──────────────────┘
                    ↓               ↓
            ┌───────────────────────────────┐
            │ Behavioral Filter: Self-interest versus │
            │    Other-regarding Behavior    │
            └───────────────────────────────┘
                            ↓
                    ┌─────────────────┐
                    │    Exchange     │
                    │   Institution   │
                    └─────────────────┘
                   ↙                   ↘
   ┌──────────────────────┐       ┌──────────────────────┐
   │ Well-functioning     │       │  Market Distortion    │
   │   Factor Market      │       │ (e.g., Payment        │
   │                      │       │   Incidence)          │
   └──────────────────────┘       └──────────────────────┘
              ↓                              ↓
   ┌──────────────────────┐       ┌──────────────────────┐
   │ Price same as no     │       │ Price higher than no  │
   │ subsidy and equitable│       │ subsidy and inequity  │
   │ distribution of      │       │ in distribution of    │
   │ earnings             │       │ earnings              │
   └──────────────────────┘       └──────────────────────┘
                   ↘                   ↙
            ┌───────────────────────────────┐
            │    Resource Allocation:       │
            │  Efficient versus Inefficient │
            └───────────────────────────────┘
```