

CONTRACT COSTS AND ADMINISTERED PRICES:
AN ECONOMIC THEORY OF RIGID WAGES

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Working Paper #318

January 1984

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*I am grateful to Roy W. Kenney and Kevin M. Murphy for valuable comments and to The Sloan Foundation grant to UCLA for the study of contractual relationships for research support.

I. Introduction

Macroeconomists have long puzzled over the fact that nominal wages are largely insensitive to aggregate economic activity. Until relatively recently this phenomenon and the supposedly resulting unemployment was "explained" by the Keynesian assumption of predetermined money wages. Although this old view can still be found in most textbooks, a new theoretical view of the labor market has developed which attempts to explain this phenomenon by emphasizing the fact that most labor market relationships are de facto long-term and that workers are risk averse.¹ A labor contract is considered similar to a mortgage with the wage merely an installment payment on a long-term "implicit" commitment to transfer a certain amount of wealth in exchange for a certain amount of labor services.² Under such circumstances we would expect the time path of wage payments to be determined solely by the convenience of the transacting parties. Since workers are risk averse and are not likely to be able to borrow or lend as cheaply as firms, the firm pays a wage over time that smooths out worker income fluctuations.

While risk aversion may exist in the labor market, rigid wages are an unlikely substitute for worker savings. These contracts generally do not cover the poorest workers nor do they smooth real (as opposed to nominal) wages. Most importantly, rigid or administered prices appear to be present in many markets where large corporations are on both sides of the transaction and hence where risk aversion is unlikely to be the prime concern. This paper attempts to apply the theoretical insights that can be obtained from these corporate contractual arrangements to the labor market and thereby begin to develop a microeconomic foundation for macroeconomic analysis based on the assumption of risk neutrality.

II. The "Hold-Up" Problem

An economist that asks why wages are sticky is essentially asking why labor is not sold in a spot auction market. Restated in this way the answer to the question is fairly obvious. Labor (and most other inputs) are purchased by explicit and implicit long-term contracts rather than in spot markets because of the presence of firm specific investments. My earlier work analyzed the potential "hold-up" problem involved when such specific investments are made by one of the parties to a transaction (Klein, Crawford and Alchian). After a firm invests in an asset with a low salvage value and a quasi-rent stream highly dependent upon some other asset, the owner of the other asset has the potential to "hold-up" by appropriating the quasi-rent stream. For example, one would not build a house on land rented for a short-term. After the rental agreement expires, the landowner could raise the rental price to reflect the costs of moving the house to another lot.

In the labor market these considerations are paramount. Many jobs require significant firm specific investments, including the investment of time on the part of the worker in learning to work with the specific team of workers within the firm's specific organizational framework.

Because the firm's brand name in most cases is likely to be relatively larger than the worker's, the worker can be expected to make much of the specific investment and the firm guarantee that it will not "hold-up" the worker by reducing his wage below the value of his marginal product. A firm generally has lower costs of creating brand name capital and hence contract fulfillment credibility because of its increased repeat purchase frequency. While a firm is always hiring additional workers and must bear the future cost from cheating now, workers have limited lifetimes and working opportunities. In addition, because of the larger size of firms compared to individual

workers, cheating firms are likely to become known more quickly than cheating workers, also reducing the short-run cheating potential for firms relative to workers.

However, it is unlikely that the equilibrium will have the worker making the entire specific investment. This corner solution would require too much firm brand name capital. Letting the firm finance some of the specific investment does not significantly increase the hold-up potential on the part of the worker. As long as he continues to make a significant investment, his threat to leave unless the wage is adjusted upward is not credible. Hence financing of the firm specific human capital investment is likely to be shared to some extent by the worker and the firm.

III. Explicit and Implicit Contractual Solutions

Although I have emphasized vertical integration as a mechanism to solve the hold-up problem, it is not possible in the labor market. In addition to legal prohibitions on slavery, incentive problems are present when we are dealing with the ownership of human capital as opposed to physical capital. However, vertical intergration need not be relied on if preinvestment one can write a complete enforceable long-term contract. It may not be necessary, for example, to own the land upon which one intends to build a house if an enforceable long-term lease is obtained before the house is built. The interesting economic question relates to the type of long-term contract that is likely to be most efficient. In particular, while the presence of specific human capital implies the necessity for a long-term contractual relationship, why are wages often set by a long-term implicit contract rather than by a long-term explicit contract?

The existing literature makes no economic distinction between explicit

and implicit contracts. Contracts are referred to as "implicit" solely in the sense of an unwritten understanding. One does not observe an explicit, written contract, yet the transacting parties are assumed to behave as if it existed. But this is a distinction without a difference. All contracts, whether written down or not, are assumed to be costlessly enforceable.

It is useful to classify contracts or elements of contractual relationships by the enforcement mechanism adopted by the contracting parties. Contractual performance can be assured either by explicit sanctions which are imposed by a third-party (e.g., a court) or by implicit two-party sanctions, namely termination of the contractual relationship. If the individual facing termination expect to be earning a quasi-rent stream in the future, the present discounted value of which is greater than the immediate short-run gain from breach divided by the probability of detection, the threat of termination will be sufficient to assure performance.³

Court enforced sanctions have the advantage over two-party sanctions in that money can be awarded to one or the other party ex post and hence the timing of performance by the transacting parties is irrelevant. Timing is, on the other hand, crucial in the implicit contract case. This is because the only sanction is the termination of the agreement and everyone keeps what they have at the point of termination. Therefore it is crucial that the future expected premium stream be greater than the hold-up potential at every point in time. With a court imposed sanction, on the other hand, the transacting parties can agree to do things in the future that will not ex post be incentive compatible. Since the court can in a sense put things back together again, exchanges can be structured so that performance by the parties need not be simultaneous. Performance can be sequential without the expected future premium stream being present in the correct magnitude at every point in time.

In choosing a contractual arrangement, transactors will trade off the costs of enforcing performance via these alternative mechanisms. Explicit contracts entail the transaction costs of writing everything down. These costs refer not merely to the ink costs involved but, in an uncertain world with a large number of possible contingencies, to the significant real resource costs of discovering all the possible things that can happen in the future and figuring out the optimal response by the transacting parties for all these hypothetical, largely irrelevant, states. Individuals will also devote time and money in attempting to obtain an informational advantage over their transacting partners and in bargaining over mutually acceptable contingent terms.

Explicit contracts are also costly to enforce because particular performance, such as the level of energy an employee is to devote to a complex task, may be prohibitively costly to measure and hence to specify contractually. Therefore contractual breach and the extent of damages will be difficult to prove to the satisfaction of a third party enforcer such as a court. Transacting parties generally rely on some proxy measure of performance, but even these proxies are often extremely complex. An employer may observe and monitor many aspects of employee behavior before deciding on termination or promotion and these signals may be extremely costly to communicate to the court.

It is therefore unlikely to find in the real world, as opposed to the standard economic model, complete, fully contingent, court enforced contracts. Such contracts are not cheaply specifiable nor cheaply enforceable. All contracts are, by necessity, somewhat vague. However, it is also highly unlikely to find a real world corner solution in the other direction. While incomplete two-party arrangements economize on the

transaction costs of writing and enforcing complete explicit contracts, they entail the costs of performance-assurance premiums and the possibility that inefficiently large "brand name" (firm specific, nonsalvageable) investments will have to be made (see Klein and Leffler).

Hence most actual contractual arrangements, including labor contracts, can be expected to consist of a combination of explicit and implicit enforcement mechanisms. Some elements of performance will be specified and enforced by third-party sanctions while the residual elements of performance will be enforced by the implicit threat of termination of the transactional relationship. The future expected quasi-rent stream received by the worker on his specific investment will generally be more than sufficient to prevent shirking and the firm's brand name capital will then prevent the firm from holding up the worker for the specific investment above this minimum amount.

It is important to recognize that workers would not be paid more than their marginal products to provide performance incentives. The wage premium to prevent shirking need only be greater than the worker's opportunity cost and with specific capital this need not be greater than the worker's marginal product. Lazear on the other hand, claims that to provide optimal incentives the worker is paid less than his marginal product in the beginning of his career and more than his marginal product at the end of his career. However, in the absence of specific capital the agency problem could be solved merely with lagged payment. While Lazear's payment scheme is a form of lagged payment, his model does not explain the particular payment path chosen. Without specific capital there would be no need for long-term employment relationships. Workers could be hired on a spot basis and paid with a lag. The brand name of the firm, namely the potential capital loss it would incur if it were not able to hire in this manner in the future, would prevent the

firm from cheating workers by not paying. In the Lazear framework there is no convincing reason for the worker's bond not to be paid all at once, similar to the initial franchisee lump sum payment (see Klein). In our framework, the wage may appear to be less than marginal product in the beginning of the worker's career because the worker is financing the specific investment out of current income. The specific investment is not all paid at once because the extent of the investment is unknown and such a payment would increase the firm's cheating potential and hence the required brand name capital costs.

IV. Explicit Contract Rigidity

Another cost of explicit contracts compared to implicit contracts is the increased rigidity of such arrangements. This implies that an explicit contract term, such as price, is more likely to differ from the "perfectively competitive" level. When this occurs, resource misallocations, in addition to wealth distribution changes, occur. These costly effects may be avoided by more flexible implicit contract terms.

This can be illustrated by considering a particular real world example — the supply of automobile bodies by Fisher Body Corporation to General Motors.⁵ In 1919, as the production process for automobiles was shifting from individually constructed open, largely wooden, bodies to metal closed body construction, General Motors entered a contractual agreement with Fisher Body for the supply of closed auto bodies. Since Fisher Body had to make a highly specific investment in stamping machines and dies, it is obvious that a short-term spot contract could not be used. Instead, a long-term (ten-year) fixed formula price contract was negotiated with the price set equal to cost plus 17.6 percent.

However, even if price is effectively fixed a buyer may be able to hold-up a seller who has made a buyer-specific investment by threatening, unless some price adjustment or side payment is made, to vary quantity demanded, including the threat of complete termination. To prevent this the General Motors - Fisher Body contract included an exclusive dealing clause, whereby G.M. agreed to buy over the period of the contract all their closed bodies from Fisher. This arrangement significantly reduced the possibility of G.M. acting opportunistically after Fisher made the specific investment in production capacity.⁶

Labor contracts often include lay-off terms which are analytically similar to this exclusive dealing arrangement adopted by G.M. and Fisher Body. If, for example, in the face of a claim of declining demand, a firm must keep wages fixed and lay off workers and is prevented from hiring additional workers of the same type at a lower wage, a contractual arrangement exists which substantially reduces the incentive for the firm to claim opportunistically a false decrease in demand. This seniority-type rule implies that the firm must also hurt itself when it threatens to lay off workers.

Within this exclusive dealing-fixed wage context the firm may still attempt to hold up workers by varying quantity demanded. Since the firm may not be hurt as much as the worker who made the specific investment, he may be able to credibly threaten layoffs to appropriate the worker's quasi-rents. To prevent this, the contract may require payment whether or not workers are working (see Feldstein). Fixed price take-or-pay contract terms made by natural gas pipeline companies are an obvious example of this in a non-labor market.⁷

While these contractual arrangements may effectively prevent the hold-up, they may produce severe misallocation problems because of their pre-set price terms. As noted above, because of information and measurement costs it is extremely difficult, if not impossible, to specify all performance terms ex ante. In the G.M. - Fisher Body case omissions in the contract were glaring and caused problems almost immediately. First of all, although the price was set on a cost plus basis, cost was defined exclusive of interest on invested capital. Given the absence of a capital cost pass through, Fisher shifted towards a low capital intensity form of production with resulting higher prices to General Motors. In addition, because transportation costs were reimburseable as part of the price formula, Fisher refused to locate their body plants adjacent to G.M.'s assembly plant, a move which G.M. claimed was necessary for production efficiency.⁸

These difficulties were not entirely unanticipated by General Motors and Fisher Body. In an attempt to prevent such problems, the contract included provisions that the price charged G.M. could not be greater than what Fisher charged other automobile manufacturers for similar bodies. However, this "most favored nation" clause proved to be ineffective, apparently because of the difficulty of defining what is "similar"⁹

It is common for transacting parties, including participants in the labor market, to use such "price protection" rules to prevent the hold-up. In this way a price increase or decrease to any supplier is guaranteed to be given to all suppliers. Established workers that are "locked-in" by a specific investment are protected by the necessity of the firm to hire new workers. While such clauses may appear to be collusive and to produce rigidity they efficiently raise the cost to the firm of cheating and thereby lower the firm's required brand name capital.¹⁰

Because of the difficulties in specifying and enforcing contractual performance these difficulties are inherent to any long-term explicit fixed price contract and are likely to be particularly severe for labor services. It is important to recognize that these problems are produced by rigid contract terms, such as price determined by a pre-set formula, and not necessarily by fixed prices. Prices are "sticky" in the sense that they do not track market conditions perfectly, that is, in the sense that formulas are imperfect. A firm may attempt to index worker compensation to market conditions, but this will necessarily be imperfect when attempting to track the return on a firm specific human capital investment. Economy-wide indices, such as the price level or the money supply, will move in the incorrect direction in response to relative (firm or industry) shocks and therefore will be used only when the economy-wide variance is large.

The benefit from such imperfect explicit contractual arrangements is obvious. They may prevent in an inexpensive manner a hold-up by the firm. But, as in the G.M.-Fisher Body case, the cost is also obvious. Sellers or buyers may take advantage of inappropriate prices and resources will be misallocated in the process. The question is whether these inefficiencies are small enough to more than compensate for the hold-up prevention benefit of fixing terms. Often, especially when demand and/or supply changes are significantly greater than anticipated, the inefficient under or overutilization of fixed price inputs becomes intolerable. In addition to the distribution effects of an incorrect price and the possible bankruptcy of one of the parties, real resource misallocation costs are created by the supplier (demander) attempting to take advantage of the high (low) price. Further, the transactor placed at a disadvantage may attempt to renege on the contract, creating unnecessary disruptions and legal expenses.

In the labor market it is highly unlikely that the wage will always be correct and it is necessary for the contract to have some flexibility to prevent worker misallocation. Given the presence of firm specific capital an incorrect wage is unlikely to lead to worker termination of the firm (quitting). In addition, shirking is not likely to occur unless the wage gets very low (when the discounted value of the premium above the worker's opportunity wage is less than the short-run gain from shirking). However, the worker can stop making continuing firm specific investments. This is analytically equivalent to partial termination and will be costly to the firm given its complementary investments. Hence the transacting parties will generally opt to "have an out" if market conditions get out of line. It generally will be efficient for the parties to bear the brand name costs involved in incomplete, implicit contracts and thereby have the ability to make adjustments to the arrangement.

V. Implicit Contract Flexibility

The difficulties outlined above lead in 1926 to the merger of G.M. and Fisher Body. More generally, however, vertical integration is not the adopted solution. Instead, the transacting parties will rely on each other's brand names, namely the present discounted value of quasi-rents connected with the transaction, to provide adjustments in the unspecified terms of the contract. In the G.M.-Fisher Body case, the current contractual period (ten year) demand grew unanticipatedly rapidly relative to the future demand so that the loss of future rents to Fisher from the failure of G.M. to renew the contract became insufficient to assure implicitly understood performance.¹¹ The short-run (in this case, ten-year) Fisher cheating potential became greater than anticipated at the time the contract was made and the arrangement

broke down.

More generally, however, contractual adjustments and renegotiation to recognized changing conditions will occur. This is the advantage of implicitly setting some contractual terms rather than attempting to explicitly fix all contractual terms ex ante. While the brand name costs (firm specific premium rents) associated with implicit contractual enforcement can be saved if contract terms are explicitly set, implicit contracts can be freely terminated and therefore the transactors "have an out" if conditions change unexpectedly.

Flexibility in price is enforced by the threatened loss of future rents from termination. For example, if the contract price becomes too low, the buyer will adjust it upward if future expected quasi-rents are sufficient; if the contract price becomes too high, the seller will adjust it downward if future expected quasi-rents are sufficient. As long as sufficient brand name capital exists, contract terms will adjust to all changes which both parties possess information about.

If, however, only one party to the transaction (say the buyer) is aware of the changing conditions that necessitates a price change, he may decide to keep price unchanged so as to minimize seller monitoring expenditures and inefficient adjustments. The asymmetric information may be, for example, that the firm knows that his demand and the worker's value of marginal product has declined without the worker knowing that this has occurred. Even though the firm is operating under an implicit contract which permits a change in the wage, in such a situation he may decide not to make the adjustment because such a change may tend to create suspicion on the part of the worker regarding the purpose of the contract alteration. The worker may believe that this is merely an attempt by the firm to seize some of his firm specific rents. This

in turn will lead the worker to increase his costly monitoring activities and, if he believe the change is unjustified, reduce his continuing investment in firm specific human capital. The firm may optimally keep the wage unchanged, foregoing the benefit of a correct marginal price (which in this case will be largely insignificant), but preventing the cost of inappropriate worker investment decisions.

Firms with extremely large brand names and hence much to lose from cheating workers are less likely to take the chance of cheating. Because worker estimates of the probability of firm cheating in such a case are so low, workers are unlikely to respond to wage decreases by inefficiently reducing firm specific investments. Therefore it will be optimal for such firms to freely adjust wages. This may explain why Japanese firms that possess such large brand name capital (because of their very high anticipated growth rates and hence the high associated future costs of currently being detected cheating) have such flexible wages.¹²

VI. Conclusion

If we are to explain satisfactorily the form of particular complex contracts adopted in the marketplace, we must consider the cost of enforcing performance in the particular transaction under investigation. As a useful starting point of analysis we have outlined a general theoretical framework of contract enforcement. The important economic questions we have examined within this framework relate to a) how incomplete the contract is likely to be, i.e., how much reliance will be placed on implicit rather than explicit enforcement mechanisms, b) what explicit terms are likely to be used in the contract, and c) what responses to unexpected changes are likely to be made by the transacting parties.

As we have seen, the extent of reliance on implicit enforcement mechanisms is dependent in part upon the costs of creating brand name capital compared to the misallocation costs of incorrect explicitly fixed contract terms. Particular explicit contractual terms, such as exclusive dealing and price protection provisions, may appear non-competitive but they efficiently economize on the required brand name capital without imposing too high a misallocation cost. A major benefit of an implicit contract is that the transacting parties can adjust to symmetric information that is not written down ex ante. The adjustment response will depend upon the magnitude of the distortion present and the quantity of brand name capital that exists.

A labor contract, is not like a mortgage contract. Although they are both long-term contractual agreements, the enforcement difficulties are much greater in the labor market. While the amount of wealth to be transferred to the worker over the life of the contract would be reasonably specified in an enforceable way, the supply of labor services to be transferred to the firm over the contract life could not be so specified. Risk neutral firms will not commit themselves to an explicitly long-term, fixed price relationship not because of the potential distribution effects caused by unanticipated changes in the market wage, but because they want to have "an out" so that contract terms can be adjusted and workers can be terminated. If the market wage, ex post, is out of line with the explicitly set wage, the contract will not be able to prevent workers from altering their behavior, including their investments in firm specific human capital and possible shirking. However, the use of an implicit contract implies that a sufficient amount of firm brand name capital must exist for the contract to be enforceable.

Our analysis obviously was meant to be suggestive and awaits empirical testing. We must "get our hands dirty" by closely investigating the facts of

particular transactions to determine hold-up possibilities and contract enforcement difficulties. Kenney and Klein presents an example of the type of analysis that might be used to analyze the role of particular explicit contract terms in efficiently reducing brand name costs. We are also attempting to verify the framework by time series and cross section analysis of industrial price behavior.

Finally, it is important to recognize that the contractual terms and responses we have examined imply price rigidity only compared to the unrealistic spot market alternative of the standard economic paradigm. Given the presence of firm specific capital and hence a potential hold-up, the long-term contracts we have been investigating are more flexible than the relevant alternative benchmark of a long-term fixed price contract. We should note however, that all of this has brought us very little distance in our attempt to understand macroeconomic fluctuations. While sticky wages would produce unemployment within the context of a spot auction market, there is no apparent reason for such a response within our framework. Firms can be expected to possess sufficient brand name capital to hire the correct amount of labor independent of the short-run behavior of wages.

FOOTNOTES

¹Important theoretical contributions have been made by Baily, Azariadis and Gordon. Wachter and Williamson and Mayers and Thaler develop explanations for rigid wages that, in the spirit of our analysis, do not rely on risk aversion.

²See Hall. He estimates that half of all workers are in jobs that will last fifteen years or more.

³See Klein for a discussion of this mechanism in the franchising context.

⁴Compulsory retirement is included as part of the contract because no matter how great the specific investment made by the worker a last period problem exists. A point will always be reached at which the expected future rent will be less than the amount needed to prevent shirking. If, after some point, sufficient investments to the worker's pension cannot be provided or withheld, mandatory retirement will have to be used.

⁵The manufacturing agreement between G.M. and Fisher Body can be found in the minutes of the Board of Directors of Fisher Body Corporation for November 7, 1919. See Klein, Crawford, and Alchian, pp. 308-310 for a discussion of the contract.

⁶If it is efficient for the buyer to purchase from many sources, the contract may call for the buyer to purchase all that an individual seller can supply at a pre-set price. Natural gas supply contracts made with monopolistic pipeline companies are an obvious example. Analogously, if a buyer makes a seller-specific investment, an agreement to supply the buyers "requirements" will effectively prevent the seller hold-up.

⁷The recent problems experienced with these contracts as market prices have declined drastically are illustrative of our concerns.

⁸See deposition and direct testimony of Alfred P. Sloan, Jr. in *United States v. DuPont & Co.*, 366 U.S. 316 (1961), 186-90 (April 28, 1952) and 2908-14 (March 17, 1953).

⁹The original contract also stated that the price could not be greater than the average market price of similar bodies produced by companies other than Fisher. In addition it included provisions for compulsory arbitration in the event of any dispute regarding price. These provisions also proved ineffective.

¹⁰For similar arrangements see *In re Ethyl Corp., et al.*, FTC Dkt. No. 9128, March 22, 1983. Posted prices for crude oil and for tuna have similar most favored nation clauses. See Gallick and Klein.

¹¹From 1919, when closed bodies were essentially a novelty, demand grew by 1924 to account for more than 65 percent of G.M. automobile production. See *Sixteenth Annual Report of the General Motors Corporation*, year ended December 31, 1924.

¹²Mitchell finds that U.S. manufacturing wages were more flexible in the 1920's than they are today. This is consistent with our analysis since demand was growing more rapidly during the 1920's. Similarly, Goldberg and Erickson find a movement to shorter term contracts for petroleum coke after the 1973 oil price rise and decrease in expected demand growth.

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