Slave Redemption When it Takes Time to Redeem Slaves

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Abstract: We analyze slave redemption programs—the buying of slaves to give them their freedom--in a simple matching model, i.e., under the assumption that it takes time to find slaves to buy or sell. Unlike in a supply and demand framework, where sufficiently large and effective redemption programs must lead to an increase in the price at which slaves are exchanged, we find that such programs do not necessarily raise the price of slaves. We also use the model to explain why a slave redemption program can slow the flow of people into the actual state of slavery, but at the same time can increase the number of people captured to be slaves. We present contemporary examples to suggest that the weight that should be assigned to costs inflicted on the extra captured people, versus the benefits enjoyed by those redeemed, depends critically on the nature of the experience at, and just after, capture.

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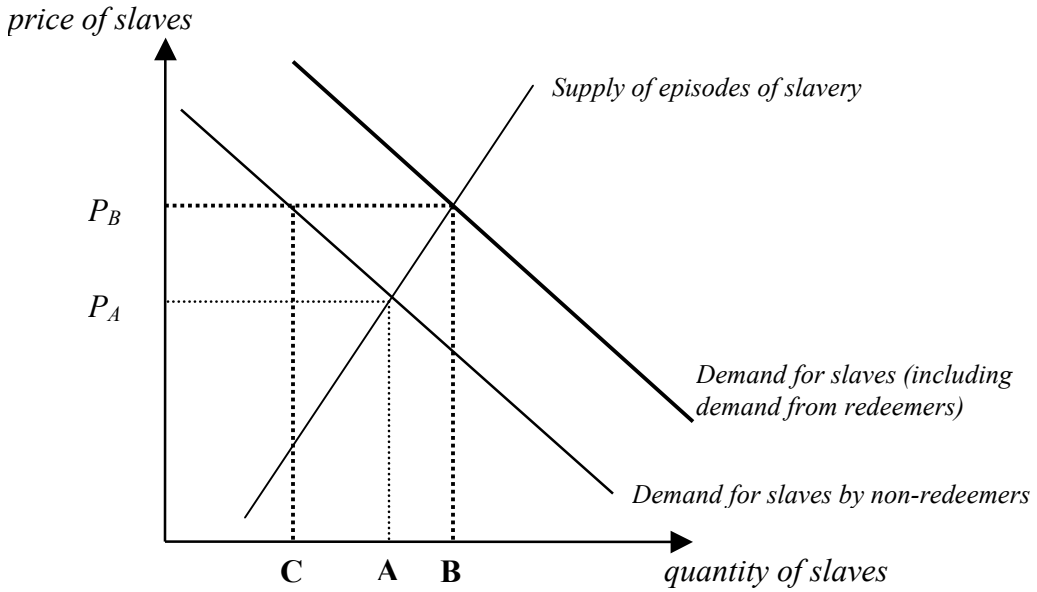
The main purpose of this chapter is to analyze the impact of slave redemption programs in the context of an economic model in which it takes time to find slaves to redeem. The model discussed in the previous chapter by Dean Karlan and Alan Krueger overlooks this kind of market friction. While many of the insights of the model they present do not change in our model, some do, particularly those concerning what happens to the price at which slaves are exchanged. For example, in the Karlan and Krueger framework, a redemption program causes the price of slaves to rise at the same time that it reduces the number of slaves. A rise in the price of slaves necessarily indicates that the number of slaves fell. In the model we discuss, a fall in the number of slaves, *ceteris paribus,* can be accompanied by an increase, decrease, or no change the price of slaves. Therefore, the behavior of the price of slaves is not a sufficient indicator of what has happened to the number of slaves, nor need it convey information about other factors that might affect the welfare of slaves.

This chapter unfolds in four sections. In the next, we briefly review the supply-and-demand model, highlighting the features that will be compared and contrasted with results of our subsequent analysis. Section 3 presents our analysis of slave redemption in a "matching" model that allows sellers and buyers of slaves to take time find each other. Both the supply-and-demand and matching models suggest reason to be concerned that a redemption-induced reduction in the number of people remaining in slavery comes at the expense of causing more people to experience some slavery, at least temporarily, and so the costs of experiencing some slavery are important to a welfare evaluation of redemption programs. Our third section discusses this issue at some length. The final section offers concluding remarks.

A Brief Review of the Supply-and-Demand Framework

Figure 1 is essentially the diagram that Karlan and Krueger use to motivate their discussion. The supply curve shows how the *number of episodes of slavery* that occur depends on the market price of slaves. The inner-most downward-sloping curve is the demand curve from non-redeemers. This curve shows how the number of slaves held by those who demand slaves for use as slave labor depends on the market price of slaves. Before the institution of a slave redemption program, the equilibrium price of slaves is P_A, and the number of episodes of slavery is the same as the number of people demanded and enslaved, i.e., the quantity at point *A*. The redemption program demands *BC* slaves, so that the total demand for slaves becomes the demand generated by those who buy slaves with the intention of using them as such, *plus* the demand of the redeemers who intend to free the slaves they buy. The market demand curve becomes the outer-most downward-sloping curve. The supply of slaves must be at least equal to the number of slaves actually bought, and so even though the redemption program leads to a decline in the number of people held in slavery to point *C*, it also must lead to an increase in the number, to point *B*, of people who suffer an episode of slavery. In this framework, it must also lead to an increase in the price at which slaves are exchanged, i.e., from P_A to P_B.

Figure 1



A Matching Model of Slave Redemption

The supply-and-demand model does not explicitly discuss the factors that affect the time it will take to achieve the predicted reduction in the number of slaves or the time spent in slavery by the additional people who endure an episode of slavery due to the redemption program. For instances where it takes time to complete a transaction, economists turn to "search" or "matching" theory (See, e.g., Pissarides 1990). This theory has been used, for example, to analyze labor markets--how long it takes someone to find a job; marriage matches--how long it takes someone to find a spouse; and, real estate markets—how long it takes someone to find a spouse. It has also been used to explain how time affects the precise terms on which these deals are consummated, e.g., a workers' wage, a marriage dowry, or a home price.

Since it likely does take time for sellers and buyers of slaves to find each other, we think it is natural to analyze the market for slaves in a matching model. As we shall see, some of the predictions of the supply and demand model continue to be true in such a framework. However,

our simple matching model produces two new insights. The first is that the increase in the number of episodes of slavery can occur *even if there is no increase in the price of slaves.* The second is that *unless there is an increase in the price of slaves*, redemption programs do not secure the freedom of any person enslaved when the program began. Absent a price increase, redemption programs can at best slow the flow of new slaves into slavery.

There are two key features to a matching model. One determines the likelihood that a buyer meets a seller in a fixed period of time. The other addresses how they settle on the price at which they will exchange a slave when they do meet. In building our model, we need to allow for two types of buyers. One type buys slaves for the purpose of using them to produce some good or to provide them some service. We refer to these as *buyers*. The others are *redeemers* who buy slaves to give them their freedom. We also allow for two potential types of sellers: *slaveholders* who use slaves for the production of some good, or the provision of some service; and, *slave-raiders* who capture slaves with the express intention of selling them to someone else.

Let us suppose that the value that a slave can provide for *anyone* who uses the slave to produce a good or service is z. Now consider what happens if a buyer and slaveholder come together to negotiate an exchange of a slave. The slave may be exchanged *if and only if* the price is z. The slave produces z for the slaveholder, so the slaveholder will not let the slave go for any less. The slave would only produce z for the buyer, so the buyer would not pay any more. We note that at the price of z the slave need not be exchanged: both the buyer and seller are strictly indifferent between making the exchange. Nevertheless, *unless* the price is z, at least one or the other *would not even consider* making the exchange.

Let us now turn to exchanges that involve slave-raiders. We will assume that each slave-raider deals with only one slave at a time, and that each buyer and redeemer seeks to buy just one

slave. These assumptions simplify the exposition of the matching model, but are not essential to our conclusions, which remain valid if more than one slave can be exchanged at a time.

The first thing a slave-raider needs to do is to capture a slave to sell. Adopting the assumption that generated the upward sloping supply curve in the supply and demand model, we assume that cost of capturing a slave is a function of the aggregate number of slaves offered by slave-raiders, and that this cost increases with the number offered. Call this function $C(S)$. Note that this cost is "sunk" at the time of capture.

After securing a slave to offer, a slave-raider must find someone to buy the slave. For the moment, we assume that there are no redeemers and just concentrate on how a slave-raider achieves an exchange with a buyer. We avoid a discussion of the many ways that a slave-raider may search for a buyer and instead follow the convention in matching models of positing that in any given period of time, a slave-raider has some probability of success, q, of finding a buyer. This probability is related to the level of aggregate activity in the market for slaves. To capture this, we posit the existence of a function, $q(\frac{B}{S})$, where B stands for the total number of buyers searching for one slave each and S for the number of slave-raiders looking for buyers. The probability that an individual slave-raider is matched with a buyer is thus a function of the ratio of the aggregate number of buyers to slave-raiders in the market. It is natural to assume that as there are more buyers per slave-raider, the probability that a slave raider will find a buyer goes up, so that q increases as $\frac{B}{S}$ increases. Nevertheless, a slave-raider is never absolutely certain to find a buyer in a given period of time, so q is always strictly less than one.

The average time it takes a slave-raider to sell a slave is related to the probability, q, that a slave-raider finds a buyer in a given period of time. To see how, suppose that q is the

probability of finding a buyer in one month, and that this probability is one in 12. With the monthly probability of meeting a buyer at $\frac{1}{12}$, the seller expects to wait 12 months to find a buyer. As this example implies, generally, the expected time to sale of a slave is the inverse of the probability of sale; therefore, from the time that a slave-raider secures a slave to sell, he expects it to take $\frac{1}{q}$ periods to find a buyer for that slave.

When the raider and buyer meet, they must negotiate a price at which the slave will be exchanged. Assuming the slave-raider incurs no per-period costs to support a slave, so that there are no costs to be saved by unloading the slave, the pay-off to the slave-raider from selling a slave is the price, p, at which the exchange occurs. We could include a cost-savings from unloading the slave, but doing that would only make our mathematical expressions more complex without changing the nature of our analysis. Note as well that the cost of capture, $C(S)$, does not figure into the slave-raider's pay-off. Since that cost was incurred at the time of capture, it cannot be saved. For the buyer, the payoff to making the exchange is the value earned from using the slave to produce a good or service less the price paid to purchase the slave, i.e., $z - p$. Clearly, the buyer will not deal if the price of the slave exceeds z, and so the price bargained must be between zero and z. The precise price bargained depends on the relative bargaining strength of the two parties, and on assumptions about the bargaining process.

In economics, it is typical to assume that bargaining power is set and is known to the negotiating parties, and that the price ultimately bargained is *Pareto efficient* in the eyes of the two parties to the bargain. This means that there is no other price that would be preferred by both parties. The well-known Nash-Bargaining problem leads to Pareto-efficient bargains. In our setting, the Nash-Bargaining problem may be stated as:

Choose p to maximize $[z - p]^{\beta}[p]^{1-\beta}$,

where the parameter β indexes the relative bargaining strength of the buyer and $1-\beta$ is the strength of the seller. We assume that all buyer and seller pairs have exactly the same distribution of bargaining power within their negotiation, although this assumption can be relaxed without changing the nature of our discussion. Note as well that the function maximized is factored into (functions of) the buyer's and the slave-raider's pay-offs.

Letting p^* be the solution to our Nash-bargaining problem. It is straightforward to show that

$$p^* = (1-\beta)z .$$

To see how intuitive this solution is, notice that p^* is lower the higher is β , the relative bargaining power of the buyer. In particular, note that if the buyer has all the bargaining power ($\beta = 1$), p^*=0; while if the slave-raider has all the power (β =0), p^*=*z*. A critical feature of the solution for our later discussion is that so long as the buyer exercises *some* bargaining power ($\beta > 0$), p^* is *less than z.*

We can now discuss how the number of slaves captured is determined. When deciding whether to capture a slave, a slave-raider expects to receive a payoff of p^* at $\frac{1}{q}$ periods in the future. Suppose an earlier payoff is preferred to a later one: payoffs received in the future are discounted at rate *i*. This means that a payoff of *p* received one period in the future would have a present value of $p\left(\frac{1}{1+i}\right)$, a payoff of *p* received two periods in the future would have a

present value of $p\left(\frac{1}{1+i}\right)^2$, and so forth. Since the expected amount of time until a slave raider is matched with a buyer and receives payoff p^* is equal to $\frac{1}{q\left(\frac{B}{S}\right)}$, the expected value of this payoff at the time the raider captures the slave is:

$$\textit{Expected present value of selling the slave} = p^*\left(\frac{1}{1+i}\right)^{\frac{1}{q\left(\frac{B}{S}\right)}}.$$

Let us simplify this expression by using the notation $F(B/S)$ to stand for the *discount factor* $\left(\frac{1}{1+i}\right)^{\frac{1}{q\left(\frac{B}{S}\right)}}$, so that the expected present value of selling the slave can be written as $p^*F(B/S)$. We note that this present value increases when the ratio of buyers to sellers increases. That is because the larger is this ratio, the higher is the probability that a seller finds a buyer in a given period of time, and the shorter is the length of time to a sale.

The expected present value is the same as the expected benefit, as of the time of capture, from capturing the slave. So long as this expected benefit exceeds the cost of capture, $C(S)$, raiding is expected to be a profitable endeavor, and more slave-raiders will want to undertake the activity. In fact, absent binding restrictions on raiding activities, additional raiding will occur until the expected benefit of selling a slave is equal to the cost of capture. That is, until

$$p^*F\left(\frac{B}{S}\right) = C(\mathrm{S}). \qquad (\textit{Equilibrium condition, no redeemers})$$

Now let us assume that R redeemers enter this market. For the moment, let us also assume that they bargain in precisely the same way as other buyers, so that there is no change in

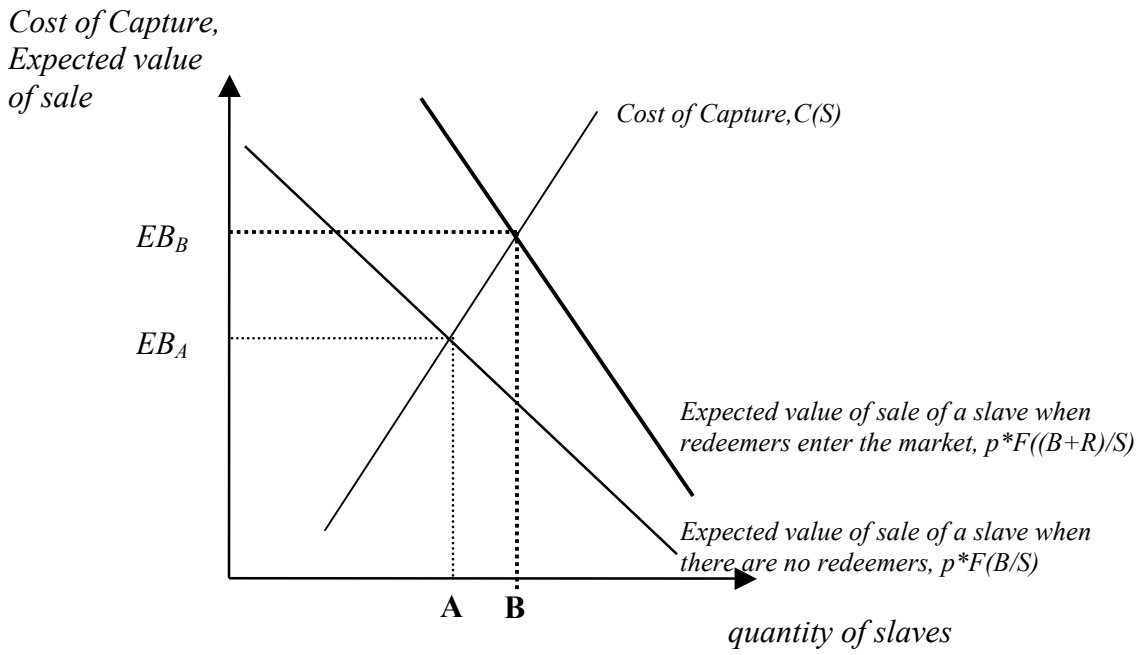
the bargained price, i.e., it stays at the same value p^*. With redeemers, the equilibrium condition becomes:

$$p^* F\left(\frac{B+R}{S}\right) = C(S) \qquad \text{(\textit{Equilibrium condition with redeemers})}$$

Using the two alternative equilibrium conditions, we can produce a diagram that looks somewhat like Figure 1, but with a different interpretation.

In Figure 2, we have graphed the equilibrium conditions as functions of S. The upward-sloping line is the function $C(S)$. The innermost downward-sloping line is the expected value to a slave-raider of selling a slave when there are no redeemers in the market, $p^* F\left(\frac{B}{S}\right)$. The expected value line slopes downward because for a given number of buyers, an increase in slave-raiders selling slaves *lowers* the ratio of buyers to slaves to be sold, thereby lowering the probability that a seller finds a buyer in a fixed period of time, and *increasing* the length of time to sale. Since sales farther off in the future are worth less today, the expected value of making sale falls when there are more slave-raiders trying to sell in the market. When there are no redeemers looking for slaves to redeem, equilibrium occurs at point A.

Figure 2



If redeemers enter the market with the intention of redeeming a positive number, R, slaves, the expected value of selling a slave becomes $p * F\left(\frac{B+R}{S}\right)$. This expected value is represented in Figure 2 by the outermost downward-sloping curve. Redeemers essentially shift the expected value curve upwards. When redeemers enter the market, there are more buyers per seller making it easier to sell a slave in a given period of time. So the duration to sale falls, and the expected value of a slave rises. Unlike in the supply and demand framework, the two expected value curves are not parallel, and the horizontal distance between them is not equal to R. This is because the shift in Figure 2 does not represent a direct increase in the demand for slaves, but rather the effect of the redeemers on the length of time it takes to sell a slave *i.e.*, on $\frac{1}{q}$. Redemption activity reduces the duration of time to a sale, but this fall does not affect the

expected value of sale by the same amount at each level of *S*. This means that we will not be able to read the number of slaves that remain in slavery after redemption programs directly off the Figure.

What we can read from Figure 2 is the effect of redemption on the quantity of slaves captured who are *either* destined for buyers *or* for redeemers. A redemption program causes an increase from *A* to *B* in the number of people who suffer slavery, similar to the effect seen in Figure 1. The move from *A* to *B* represents the increased capture of slaves due to redemption, and it represents an increase in the total number of slaves available for sale. We can also see from Figure 2 that redemption programs cause the expected value from the sale of a slave to increase from EB_A to EB_B. Because we have assumed the price of slaves to be fixed in all instances at p^*, this is of a similar spirit to, but not the same as, the price effect shown in Figure 1. In this example, the expected value goes up because redemption programs make the sale of slaves happen more quickly, *not because of changes in the price of a slave.*

In addition to the obvious contrast with the prediction about price from Figure 1, this point may be of some practical relevance because one way in which redemption programs have been defended against concerns that they are having some negative impact is to point out that their activities have had no upward effect on the price of slaves exchanged. Jok Madut Jok (2001, p. 175) notes from his experience observing slavery in Sudan that the price at which slaves are exchanged remained at around $50 after the entry of international redeemers into the market. He also (p. 176) cites one redeemer working in Sudan on behalf of Christian Solidarity International (CSI) who says he will not pay more than $50 for a slave, and will stop redeeming if the practice evolves in to a "free market." Finally, Jok reviews arguments that suggest that local redeemers, e.g., families, friends and neighbors, of those captured would resist the activities

of the outside redeemers because it would raise the price they must pay. He (p.178) finds that instead the local redeemers welcome the help from outsiders. These arguments all turn implicitly on the notion that absence of an increase in the price of slaves is a good indicator that redemption programs are having no unintended negative impacts. But in our model, negative impacts have no necessary implication for price, and so price is not a relevant indicator for assessing whether slave redemption programs are having some negative impact.

In the context of our model, we can make an even stronger point. Suppose redeemers determine the price they will pay for slaves by observing the average selling price in the market, and decide to make take-it-or-leave it offers of just that price. Before redeemers enter the market, slaves can be exchanged at two prices, z, and p^*, which is strictly less than z. The average of these two prices must be strictly less than z. So the price a redeemer will pay must necessarily be less than z. If this is how redeemers operate, they will never be able to buy back slaves actually being used in production. Only a slave-raider would sell a slave at a price below z. In order to buy from slaveholders, the redeemer therefore needs to be prepared to raise the price that he will pay to z or higher. Certainly, the assumption that we made that each slave produces z for a slaveholder drives the result that no slave in production will be redeemed unless redeemers are prepared to pay higher than the observed market price; however, the more general point is that some slaves will be worth more than the observed price to their slaveholders, and redeemers will never be of any help to these slaves unless they are willing to pay higher than that price.

It is also worth noting that were redeemers to offer a price of slightly more than z, the effect may not be to induce more slave-raiding. A price of slightly more than z would induce slaveholders to join slave-raiders as willing sellers in the market. This would have the effect of

lowering the ratio of buyers and redeemers to sellers and therefore of lowering the probability that a seller makes a sale. Unless the higher price paid by redeemers is high enough, the expected value of a sale could fall, relative to both that in our prior equilibrium with redeemers, and even with respect to that observed in the equilibrium without redeemers. In this latter instance, redemption rescues existing slaves while creating an incentive to capture *fewer* new slaves. An increase in price in this instance implies that redemption does not cause harm, and in fact is a positive indicator of successful slave redemption programs.

Returning to the assumption that redeemers pay p^*, we see that the only effect that redeemers have is on the flow of new slaves into slavery. With Figure 2 we have already shown that redeemers' presence increases the capturing activities of slave-raiders. We have yet to determine how many of the extra captured slaves go to buyers, and thus remain in slavery, and how many are redeemed. While Figure 2 does not aid in making this determination, it is possible to use the equilibrium equation on which this Figure is based to determine the *elasticity* of sales by slave-raiders with respect to the number of redemptions. An elasticity is the percentage change in one variable (sales by slave-raiders) with respect to a change of one percent in another (number of redemptions). If the elasticity of sales by slave-raider with respect to redemptions is greater than one, then more slaves are sold than are redeemed, implying that some of the slaves who are captured because of the redemption program must remain in slavery. If the elasticity is less than one, then more slaves are redeemed than were captured, implying that redemption ends more episodes of slavery than it created, and the number of people left to flow into slavery falls.

The equilibrium equation (with redeemers) can be shown to imply that the elasticity of slave-raiding with respect to redemptions is less than one. In terms of Figure 2, this means that while redemption programs induce AB more episodes of slavery, they redeem more than AB

slaves. Intuitively, this is for two reasons. The first is that since capturing an additional slave raises the cost of capturing still more, there is a natural brake on the number of new episodes of slavery. The second reason is that the redemption programs raise the opportunity cost of holding onto a slave to look for a buyer because the expected value of selling a slave decreases as the date to sale is put off. Because rising costs of capture tend to discourage more capture, and because rising opportunity costs tend to discourage waiting for buyers, the net effect of slave redemption programs is to cause the number of people sold to buyers to fall, even though they cause more people to be captured by slave-raiders.

From the perspective of the people who suffer through slavery, the important social welfare trade off to evaluate is whether reducing the number of people who enter into longer-term slavery is worth exposing more people to the capture that creates the supply of potential slaves. Two questions seem relevant to the evaluation of this trade-off. The first is how long are the redemption-induced captives held by slave-raiders? The answer to this is that the time to redemption for any slave redeemed should be, on average, $\frac{1}{q}$ periods. The second is what is the nature of the experience of an eventually redeemed captive while waiting to be redeemed? We discuss this question in the next section.

Costs Associated with Redemption Induced Episodes of Slavery

Unless the price at which slaves are exchanged rises so high that all slaveholders would rather sell their slaves than hold on to them, both the supply-and-demand and the matching models unambiguously predict that the benefit of slave-redemption in terms of lowering the number or stock of slaves comes with a cost of exposing some people to slavery who otherwise would not have been. In the matching model, we saw explicitly that these redemption-induced slaves will suffer some time in slavery. So the nature of their experience during this time, i.e.,

the costs imposed upon them, is relevant in evaluating the benefits against the costs of slave redemption.

Much of the balance in this evaluation should turn on those costs that are imposed on everyone who experiences sometime as a slave, at or near the time they enter slavery. If these "up-front" costs are particularly high, redeemers should be especially cautious about the risk of inflicting them on more people. However, from our reading of a variety of stories about how people come to be slaves, it is clear that there is no universal argument to be made that the risk of these up-front costs should be of overriding concern. They should probably be given very high weight in some contexts but little in others. We discuss three examples that illustrate this point.

The first example comes from the Sudan, circa the mid-to-late 1990s. A number of sources (e.g., UN Special Rapporteurs 1995 and 1999; Jok 2001; Report of the International Eminent Persons Group 2002) establish the existence of slavery and a slave trade in that country and at that time. All deal to some extent with the way slaves enter slavery, but Jok (2001, 33-40) paints the most vivid picture. Women and children are taken in raids on Dinka (a Southern Sudanese tribe) villages. They may be raped, beaten or both. Often the men in the villages--the fathers, sons and brothers--are killed. Livestock, the main productive asset, is stolen. Villages are burned to the ground. The women and children endure an arduous trip to the place where they take up their slave duties. More beatings and rape occur along the way. All of this harm, just at the very beginning of someone's time as a slave: harm to their own physical and mental welfare, loss of family members, and destruction of livelihood and homes. If just becoming a slave involves these harms; then slave redemption, if it does increase the number of episodes of slavery, is responsible for the imposition of these costs on some people.

In fact, in the case of modern-day Sudanese slavery the physical harm done at the beginning may be the bulk of the *physical* harm inflicted:

> . . .It is easy for an Arab slave owner to avoid criticism as well as his free his conscience if he can create a situation for the Southerners displaced to the North where they have attempted to justify keeping slaves by claiming it to be an act of mercy . . . The slavers are often convinced that they are doing a favor for the captives; they regard the Dinka culture as inferior and believe that these Southerners are fortunate to have been incorporated into a superior culture. This is the kind of explanation that has caused some historians to describe early slavery in the Muslim world as benign. Some writers are doing the same regarding present-day slavery in Sudan.
>
> A courteous treatment of slaves, undoubtedly, makes slavery more acceptable to the northern society and sometimes to the slaves who were caught at a very young age and incorporated into northern culture and religion. But does not make it less than slavery. A slave is a slave. Moreover, the current Sudanese slavery is less an economic practice than a cultural project, because there are many poor Baggara who hold slaves that often live no worse than their master. (Jok 2001, 63)

Inasmuch as this quotation suggests that the daily life of being a slave once one has been a slave for awhile may be less harsh than what one suffers early in their tenure of being a slave, it suggests reason to be more worried about the costs that may be inflicted on redemption-induced slaves, than benefits produced by securing the saving of other slaves.

Slave redemption did occur during this time in Sudan, and it spurred great controversy. Some of the controversy was specifically about whether or not redemption programs encouraged more raiding for slaves (see, e.g., Miniter 1999, and Human Rights Watch 2002). In response to concerns that they did or could, one group of redeemers, Christian Solidarity International (CSI, 2002) issued a statement that said, in part:

> The fact is that since 1998, while CSI has redeemed increasing numbers of slaves, the number of slave raids and the number of women and children taken into bondage have diminished. This trend has been confirmed by the independent UN Special Rapporteur for Sudan, Gerhart Baum in his most recent report to the UN Commission for Human Rights.

What the CSI statement does not acknowledge, but what is clear from reading many of the other already cited sources, including those from the United Nations, is that there were a variety of

other initiatives taking place in the Sudan at the time aimed at reducing raiding, and it is not at all clear that CSI is justified in the causal implication it makes. Returning to the view from the model of the previous section, the fact that redeemers apparently did not cause an increase in the price of slaves suggests another reason to be skeptical that redemption lead to a decrease in raiding activities. We tend to share the view of Jok (2001 p.175) that there is no empirical evidence to evaluate the true impact of slave redemption on the incidence of Sudanese slave raids. In light of this, the fact that the raids in general are so violent, and the fact that economic theory suggests that redemption should lead to more of them, leads us to counsel extreme caution to redeemers in situations such as the one discussed in Sudan.

People who become slaves do not always enter slavery through violent raids or abductions. Our second example concerns trafficking in human beings. Trafficking, particularly in children and women, is a well-known and global phenomenon that often leads to slavery. But during the time of traffic, it may not be particularly harmful. This is because victims of trafficking are often tricked into willingly going with their trafficker (see, e.g., Bales 1999; KC et. al 2001; and, Rogers and Swinnerton 2004). The victim leaves her home on the promise of a better life—a good job or better schooling--in some far-off destination. But when she arrives to her ultimate destination and is enslaved, she finds her ability to leave severely restricted: sometimes violently, but perhaps also or instead through psychological manipulation or the theft of necessary travel documentation.

It is easy enough to recast our model as one of trafficking if we re-label our model's "slave-raiders" as "traffickers." Then we see that, at worst, redemption increases the flow of people trafficked, but stems the flow of people who actually make it to the final destination of slave. In most of the stories we have read, the victim does not realize she has been tricked until

she reaches the final destination, i.e., after she has left her trafficker, and the horrors recounted occur from this point on. Rarely have we seen an explicit or detailed treatment of a victim while being trafficked. But precisely because the conditions endured during trafficking are not addressed by those concerned with the phenomenon, it seems possible that, at least compared to the way people become slaves in Sudan, the treatment is relatively benign, and that taking the risk of encouraging trafficking to stem the flow into slavery may be more palatable in the context of trafficking than it may be in a situation like Sudan.

Our final example concerns instances when people enter into situations voluntarily that either appear to be slavery to others, or may not become "forced" slavery until later in a person's tenure in their situation. The chapter by Stanley Engerman in this volume gives a number of historical examples of "voluntary slavery." A recent study of girl and boy victims of sexual exploitation in Mexico (Azaola, 2000) gives some examples of children who knowingly, voluntarily and without any coercion, enter prostitution. A few - - willingly, knowingly, and without coercion - - choose to do that permanently. Others decide they would like to leave and can do so without being prevented from doing so. Still other are, at the time they want to leave, subjected to a variety of coercive mechanisms that prevent them from doing so. The analysis relevant for the last group is essentially the same as for the trafficking example discussed earlier. Our concern now is with the case when entry and exit is purely voluntary.

Again we turn to our model to provide some insights on the downside risk of redemption programs in these situations. This time, we re-label the slave-raiders as the "victims" themselves and note that the upward sloping $C(S)$ curve in Figure 2 suggests that as more and more victims make themselves available, the cost of purchasing them rises. This is because the latest victims to enter will likely require a higher payoff to do so than the earlier ones. A redemption program

increases the number of victims who make themselves available, but decreases the number who actually enter, prostitution. In this instance, a redemption program provides the victims who participate with a better option than prostitution. And since the offering of this option causes more people to choose to leave than choose to enter, and since "victims" in all instances make choices, we may be least concerned about "up-front" costs associated with redemption programs in these instances.

Concluding Remarks

In this chapter we analyzed slave redemption programs in a simple matching model. Unlike in a simple supply and demand framework, where sufficiently large and effective redemption programs must lead to an increase in the price at which slaves are exchanged, we find that such programs have no necessary impact on price. We also demonstrate that a slave redemption program can slow the flow of people into the actual state of slavery, but at the same time can increase the number of people captured to be slaves. We discussed redemption programs in the context of three contemporary examples of slavery. This discussion suggested that downside risk of harming someone in the name of helping someone else appears highest in situations where violence or coercion occurs immediately, lower in situations where the individual is not harmed until some later time, and lowest when the individual enters the situation of their own accord.

The welfare comparisons discussed so far in this paper have all been focused on slaves and potential slaves. There is another welfare issue to consider: redeemers and society at large may be better off if some program can be devised to bring about a reduction in slavery without first, or in part, encouraging more of it to occur. There is likely an endless list of alternative policy options and actors to consider, and all probably deserve at least the same analytical

attention we pay here to redemption. We conclude by just listing a few, in the context of our examples from the previous section. We also limit ourselves to suggestions that could conceivably be funded in the same manner as redemption programs have been recently, namely, by appealing to individuals to make voluntary donations in the hopes of helping other individuals.

In the case of Sudan, not only is the vulnerable population—the Dinka--identifiable by ethnicity, according to Jok (2001), so are the slave-raiders. They are the Baggara. We suggest two alternative options, one targeted at each group. To target the Dinka, it may be worth considering refugee sponsorship programs that offer them the opportunity to move from the place where slave-raiding is likely to occur and re-settles them in other countries. To target the Baggara, perhaps a scheme whereby they are paid not to raid could be considered.

In instances of trafficking (via trickery) and "voluntary slavery," a productive solution may lie in finding ways to give vulnerable people better choices so that they do not make themselves available for these situations. For example, if someone is vulnerable to entering the sex trade because their other economic opportunities are dismal, can something be done to better the other opportunities so that at least one is better than the sex trade? This is in fact similar to a question that is receiving much attention in the area of child labor policy (see, e.g., United States Department of Labor, 2000 and 2002), where, for example, strategies such as subsidies to families who send their children to school and the provision of income-generating assets to families vulnerable to participation in child labor have been devised to try to expand the set of choices from which families can choose, and hopefully, offer one that is better than child labor. In fact, in some instances the question is the same, as some forms of child labor that concern

policymakers are in fact practices that many would label slavery (see, e.g., International Labor Organization 1999).

The point of this concluding discussion is not to advocate for another option over redemption so much as to point out that there are other feasible policy options. In some full social welfare accounting, informed not only by economics but also by ethics, the benefits of slave redemption may outweigh the costs. But it certainly is also wise to consider, and more extensively than we have the opportunity to do here, the possibility that some other program might generate equal benefit at lower costs.

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