Market Intervention, for Better or for Worse: Gasoline Taxes and Agricultural Subsidies

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There are some things that markets do well, and other things that they do badly or cannot do at all. In many instances, free markets create efficiency. There are several different notions of efficiency, but most of them focus on using scarce resources in the best possible way, in an aggregate sense (i.e., the total welfare of market participants is maximized, without regard for how this welfare is distributed). Markets are generally not very good at creating equity, or fairness. What is equitable is subjective, but free markets do not achieve many reasonable definitions of equity. Some kind of efficiency is usually the best we can hope for. When we consider the various ways in which government might intervene in a market, it is clear that the goal of many forms of intervention is to create greater equity. For example, the U.S. income tax system is not only a means of raising government revenue; it is also a means of redistributing income. It is a progressive tax system, meaning that those with higher incomes pay a higher percentage of their incomes in taxes (not just a higher total amount). Those with the lowest incomes receive a payment from the Internal Revenue Service rather than paying income tax in the form of the Earned Income Credit.

Efficiency and equity are fundamentally different concepts, and they are often at odds with each other. The income tax system satisfies some notion of equity, but it also makes the labor market less efficient. Generally, imposing a tax on some kind of exchange (e.g., a worker selling labor to an employer) reduces the volume of exchange. Assuming that the exchange is beneficial, reducing the amount exchanged reduces the total benefit generated. In the labor market, a worker whose income is taxed might have less incentive to work more hours. This effect is more extreme at higher income levels, where the degree of taxation is larger. However, this is not to say that income taxes are bad or that progressive income taxes are especially bad. It is simply a matter of weighing benefits (more equity, greater government revenue) against costs (less efficiency). A government policy might be regarded as a good one if the benefits outweigh the costs; however, this may involve a subjective assessment of the equity effects of the policy.

In some cases, a government policy may increase equity at the expense of efficiency, but there are other cases in which free markets are not efficient and can be made more efficient by some kind of government intervention. This paper considers the rationale for two different forms of government intervention: gasoline taxes and agricultural subsidies. In both cases, it will be argued that current policies are misguided, although in opposite directions: Gasoline taxes should be higher, and agricultural subsidies

should be lower or nonexistent. When considering any specific government policy that involves intervening in a market, it is useful to ask three questions:

- What is the policy meant to accomplish? Specifically, what do we think the market is not accomplishing on its own? What problem is being generated that we think needs to be fixed?
- What are the actual effects of the proposed policy? Does it have the desired effect? Are there undesired side effects?
- Even if we can agree that there is a problem that needs to be solved and that the policy accomplishes it, are there better ways of accomplishing the same solution? Can we achieve the same desired effect and at the same time reduce or eliminate the undesired effects?

Since evaluating equity effects is necessarily subjective, there may be reasonable disagreement over the desirability of a particular policy. However, a defensible opinion must consider these questions, at least implicitly. It is simply naïve to support a policy for its positive effects without considering the adverse effects, as well as any reasonable alternatives.

Gasoline Taxes

Many economists support a dramatic increase in gasoline taxes in the U.S. Now and then a politician, such as 1992 presidential candidate Ross Perot, supports this as well. The rationale is that driving gasoline-powered automobiles generates externalities. This means that there are costs associated with gasoline consumption that are not borne by the person who makes the decision to consume the fuel. There are three kinds of costs in this case:

- Burning gasoline causes pollution, which contributes to global warming, which is costly to everyone on the planet (Poterba, 1993);
- An additional car on the road increases congestion, which imposes a time cost on other drivers (Diamond, 1973);
- An additional car on the road increases the likelihood of accidents, which is costly not only to the accident victims themselves, but also to the entire health-care system (Dubner & Levitt, 2008).

The fact that one decision-maker can impose costs upon others not involved in the decision-making can legitimately be viewed as unfair, but it creates inefficiency as well. Consider the following analogy. My friend Bob and I go out to dinner and decide to split the check evenly, no matter what each of us orders. After we have ordered and eaten our entrees, the waiter presents us with dessert selections. If I value a dessert at $6 (meaning that I am willing to pay no more than $6 to consume the dessert), but the dessert is priced at $10, I will order the dessert, knowing that this decision will only raise my share of the check by $5. Because I do not bear the entire cost of the dessert, I make an inefficient decision: The total value of the meal to Bob and me increases by $5, but the cost of the meal increases by $10. In a similar fashion, consumers of gasoline consume more gasoline than is socially desirable because individual consumers do not bear the entire cost of their own gasoline consumption, i.e., consumption is greater than what would be chosen by a single decision-maker who bears all of the costs and realizes all of the benefits generated by gasoline consumption.

A tax on gasoline can be used to induce consumers to adopt more efficient behavior. The optimal tax would be the amount that induces each consumer to act as if he is personally bearing all of the costs of his own consumption. In the case of my dinner with Bob, if the restaurant imposes a "dessert tax" of $5 for each dessert ordered, then I will only order the dessert if I value it at least $10, since the cost I bear of ordering the dessert is $10 ($5 increase in my share of the check and $5 tax). Figuring the optimal tax on gasoline is much trickier, because it is difficult to assess the costs of gasoline consumption in precise monetary terms. Economist Steven Levitt, author of *Freakonomics,* has estimated that correcting the three externalities associated with gasoline consumption would necessitate increasing gasoline taxes by at least $1 per gallon, which would mean approximately tripling current gasoline taxes (Levitt, 2007).

Such a tax has never been implemented because of its political unpopularity. To a certain extent, Americans simply don't like paying taxes and object to any tax increase (and according to UCLA transportation expert Eric Morris taxpayers find gas taxes particularly noticeable

and objectionable) (Dubner, 2008). A specific criticism of gasoline taxes is that they are regressive: those with lower incomes spend a higher percentage of their income on gas, and thus pay a higher percentage of income toward the tax. This is the case because, to some extent, gasoline is considered a necessity: gasoline consumption is not as dependent upon income as consumption of many other goods (Dahl & Sterner, 1991). In Summer 2008, when U.S. gas prices surpassed $4 per gallon, the average American was spending 4% of his take-home income on gasoline. At the same time, in some rural areas, the figure was more than 13%, due to two factors: lower average incomes in these areas, and reliance on gasoline-powered vehicles for commuting greater distances to work (Krauss, 2008). One might argue that high gasoline taxes are simply too burdensome to many Americans in the lower income brackets.

To understand how misguided this criticism is, consider another example of a good for which lower-income consumers spend a greater percentage of their income: food. What if food prices are too burdensome to many low-income Americans? Surely, food is at least as necessary as gasoline. Imagine that, because we are troubled by how difficult it is for low-income families to afford food, we subsidize food purchases—paying food retailers a fixed amount for each unit sold, resulting in a lower market price for food—for everyone, not just low-income food buyers. Then it would be easier for those with low incomes to afford food, but it would also be easier for those with average or high incomes. Because consumers would not bear the whole cost of food consumed, they would have greater incentive to buy food. This would again lead to inefficient consumption: there would be more consumption than what would be chosen by a single decision-maker who bears all of the costs and realizes all of the benefits generated by food consumption.

An across-the-board food subsidy would allow those with low incomes to afford food, which may seem equitable, but it would also distort food consumption for the entire market, which could in aggregate be very costly. Even if we agree that enabling low-income consumers to afford food is necessary, such a subsidy is pretty clearly a bad idea, especially given that there are better alternatives. A program like food stamps achieves the same equity effect without the dramatic loss of efficiency, since the benefit can be directed at low-income consumers only.

Not taxing gasoline more heavily has essentially the same efficiency effect as the hypothetical food subsidy: gasoline is consumed to the point where the costs exceed the benefits, because not all of the costs are borne by the buyer of gasoline.

Still, we are left with the potentially objectionable equity issue, that an efficient gas tax will be a relatively greater burden to lower income consumers. Here is a proposal to alleviate that concern. First note that higher gasoline taxes would generate government revenue. The imposition of the tax corrects the inefficiency of the market by decreasing gasoline consumption. It might seem like a good idea to spend the tax revenue on repairing some of the damage caused by gasoline consumption, but how the revenue is spent does not directly impact the efficiency effect of the tax. If part of this revenue were given to low-income families, the undesirable equity effect of the tax could be eliminated or at least lessened. This benefit could most easily be administered through the income tax system, where there are already mechanisms in place for the gathering of relevant income information and the transfer of dollars between citizens and government. Perhaps it would even be possible to base the benefit on a person's estimated annual fuel consumption as well as income.

A crucial point is that there should not be a tax rebate based on one's actual consumption of gas, as this nullifies the efficiency effect of the tax. If increasing the gas tax results in an increase in the price of gas of $1 and a low-income consumer will receive an income tax credit equal to $1 for every gallon consumed, then that consumer has the same incentive to consume gasoline as before the tax increase. The idea of the tax is to force the consumer to take all of the costs, social and private, into consideration when deciding whether to drive an additional mile, or to buy an additional gallon of gas. Even a low-income consumer will choose to pay a high price for gas if this enables him to drive to work and if the alternatives to driving are sufficiently costly or inconvenient, but this same person might choose to drive less when the benefit

of driving is not as high or where the alternatives are more attractive (Dahl & Sterner, 1991). Every gasoline consumer faces some degree of choice; higher taxes lead to more efficient choices. If we turn part of the tax revenue into lump-sum benefits for low-income consumers, they will still be able to drive themselves to work.

One issue to bear in mind is that the pollution externality results from burning gasoline but not necessarily driving, whereas the congestion and safety externalities result from driving but not necessarily from burning gasoline. If we consider alternatives to high gas taxes, we must consider other ways to discourage driving as well as other ways to discourage gasoline consumption. There are basically two ways to discourage driving: to impose a cost per mile driven, or to impose a cost per car or per driver. Imposing a cost per car or per driver could potentially have the desired efficiency effect, but only if the cost results in some people not driving at all. This would raise an even greater equity concern than the gas tax would: now those with low incomes could not afford to drive at all. Imposing a cost per mile without taxing fuel consumption would rely on some kind of monitoring of miles driven, which would be impractical and at least as objectionable as taxing gasoline. Another way to discourage gasoline consumption itself is to subsidize the development of non-gasoline-powered engines. This would have a dubious effect on consumers' driving behavior; if people are offered an alternative to driving a gasoline-powered engine, nothing says they have to take it. Furthermore, taxing gasoline has a more direct effect on development of alternative technologies: in the presence of high gas taxes, such alternatives are valuable to consumers and thus profitable for producers.

Agricultural Subsidies

Although there is no general subsidy for retail food products, as in the hypothetical example given previously, the U.S. government does support the production of many agricultural products. This support may take various forms, but it is convenient for present purposes to think of agricultural supports in terms of direct subsidies, wherein a farmer receives a payment from the government that increases with his volume of production. (There are other agricultural policies, such as soil conservation, with somewhat different implications from those of subsidies and similar supports.) Subsidies clearly benefit the recipients, while at the same time encouraging greater production; the subsidy has the same effect as raising the market price the farmer receives.

As of 2006, the U.S. government was spending approximately $25 billion annually on agricultural subsidies. More than two dozen commodities are supported, but more than 90% of the total government expenditure is directed to five crops: wheat, cotton, corn, soybeans, and rice (Riedl, 2007). Most of the benefit goes to large corporate farms: according to the Environmental Working Group's Farm Subsidy Database, the largest 10% of subsidy recipients received 74% of government subsidies from 1995 to 2006. These kinds of subsidies were first introduced in the Great Depression (Rausser, 1992) when low prices threatened the well-being of American farmers, who comprised 25% of the population at the time (Riedl, 2007).

Agricultural subsidies are costly in a number of ways, in addition to the government expenditure. Subsidies result in overproduction; thus, agricultural products are produced and consumed past the point where the costs outweigh the benefits (Rausser, 1992). The surplus goods generated are often given away as foreign aid or sold on the world market for less than the domestic price. This depresses world prices for agricultural products, which harms foreign producers and may have political consequences for the United States (Roningen & Dixit, 1989). Another effect is that more capital flows to the U.S. agriculture industry, which depresses the productivity of other U.S. industries (Hertel, Thompson, & Tsigas, 1989).

There does not appear to be a consensus regarding the rationale for today's agricultural supports, but we can examine a number of potential rationales to determine their validity. A well-known effect of subsidies is that the market price is lower than it would be without the subsidy (Cramer, Jensen, & Southgate, 2001). Making food more affordable to the poor could be one policy goal. However, as noted previously, there are more efficient ways of achieving this same equity effect.

Another possible rationale is that many farms would go out of business without subsidies. That eliminating subsidies would drive many farms out of business is not a matter of debate, but it is not clear that this is actually a problem. It cannot be that subsidies are necessary to ensure that enough of these agricultural products are produced. This is one of the things the market can accomplish on its own—price adjusts so that supply meets demand. The number of firms in the industry adjusts so that those in the industry can survive at the market price; those that cannot survive exit the industry.

A related concern is that we need to ensure the domestic supply of agricultural products, so that we are not at the mercy of foreign firms located in countries we may or not be friendly in the future. One can easily make this sort of national security argument for something like defense products, since there is a clear advantage to ensuring that American missiles are produced by American firms. For American agriculture, there are good reasons to think that the industry will continue to thrive in the absence of subsidies. One is that subsidized commodities are largely exported; it is thus possible to reduce subsidies so that exports are reduced without threatening domestic supply (Sumner, 2007). Another is that the lack of subsidies for many agricultural products (e.g., beef, poultry, and many fruits and vegetables) has not eliminated domestic production of these products (Reidl, 2007). Furthermore, if relations between the United States and the rest of the world ever deteriorate to the point where there is no one to buy food from, we will have problems that subsidies cannot fix.

Yet another rationale is that subsidies smooth out the fluctuations in the industry, so that firms do not have to exit the industry when growing conditions are unfavorable and reenter later. Here again, this is something that the market can deal with on its own. A business owner that expects his business to be profitable on average has incentive to stay in the market during a lean year, even if this means going into debt temporarily, and future markets have the effect of smoothing prices and production over time. Furthermore, if the purpose of subsidies were to protect against market fluctuations, we would expect to see subsidies during years that are unfavorable to the farmer, whereas U.S. agricultural subsidies recur year after year (Morgan, Cohen, & Gaul, 2006).

It could be that agricultural subsidies are politically feasible in the United States because many voters feel sympathetic to the plight of the farmer, and not many understand the implications of subsidies. We see that some farms are in danger of failing, and this is not just a matter of a business exiting an industry but perhaps a family's loss of a generations-old way of life. In deciding what to do about this situation, a good start is to consider why so many farms are in danger of failing so much of the time. The forces pressuring firms to exit the industry are certainly not unique to agriculture. Many firms exit many industries every year, and it is usually efficient for them to do so. A firm becomes unprofitable because demand for the firm's product is not sufficient to compensate for the resources employed by the firm. If the firm goes out of business, these resources will eventually be redirected to other uses. Over time, capital resources end up where they are valued most highly. More efficient firms may remain in an industry while others exit. If demand for an entire industry's output wanes, the industry as a whole may shrink or disappear altogether. Technological advances within an industry may lead to consolidation of many small firms into a few large firms.

As an illustration, consider the shoemaking industry. Two hundred years ago, shoemaking was very labor-intensive. Any shoe sold was made by a skilled craftsman who produced relatively little output, and there were many such craftsmen. Over time, the industry evolved because of technological advances. It became possible to manufacture shoes by machine, and it was most cost-effective for large firms to use this machinery to manufacture large quantities of shoes. Now, handmade shoes still exist as a specialty item, but the vast majority of shoes are machine-manufactured by a relatively large firm. In retrospect, it is clear that it would have been pointless to subsidize shoemakers to keep them in business in the face of technological advance and industry consolidation. To do so would have been postponing the inevitable at great cost. It clearly benefits society as a whole for the shoemaking industry to evolve, although this necessitates some individual shoemakers going out of business in the short term (Jones, 2009).

Technology and consolidation threaten the American farmer. Farming has become less labor-intensive, and large farms can employ less labor and more machinery to be more cost-effective. Foreign competition is another factor. Whatever the source, there are market forces pressuring some farms to exit the industry. Using subsidies only postpones this, and it incurs the costs described previously (i.e., increased government expenditure and decreased efficiency). Letting the market operate freely allows some firms to exit and leads to a more efficient distribution of resources. This benefits society as a whole, although some farmers are clearly worse off in the short term. When an economist says he does not support agricultural subsidies, it does not mean that he does not care about the farmer. The emotional trauma engendered by losing one's business, especially when one's sense of self resides largely in the business, is a very real cost.

The question is not whether government policy should concern itself with this kind of cost, but how to do it. If the government wants to help the farmer while minimizing the cost to the taxpayer, there are a number of other measures that could ease the farmer's transition out of the farming industry, instead of using subsidies to keep farms afloat indefinitely. The resources employed by a failing firm eventually find a more productive use, but the process can be aided by government intervention. The money used for subsidies could instead be used for job retraining, loans to start new businesses, or basic grants. If the government simply wrote the farmer a check for the profits he would receive under the subsidy (without tying the payment to the farmer's production), it would actually be less costly than a subsidy because it would not be accompanied by market distortion. To do something like this for existing farmers, but not for any new entrants, would protect those farmers who would go out of business in the absence of subsidies without creating long-term overproduction and inefficiency.

Conclusion

Markets do some things well. In a free market, resources tend to be used in the way that is most valuable to society as a whole. Sometimes the market fails to provide efficiency, as when the costs of an activity are not incurred by those engaged in the activity. In such a case, government intervention can create more efficient incentives for market participants, and thus a more efficient outcome. Other times, the market creates an inequitable situation, as when some market participants suffer unduly for the sake of efficiency. Here, market intervention can create greater equity. It is worthwhile to pinpoint what deficiency of the market one is trying to correct, to identify all the effects of different kinds of market intervention, and to consider alternative methods of market intervention in order to produce the best solution, not just a solution.

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Biography

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