Preferences for Firearms and Their Implications for Regulation

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More than 40 percent of Americans reside in a household that contains at least one firearm. Combined, American civilians own roughly 400 million firearms. Both the popularity of firearms and the codification of the right to bear arms in the U.S. Constitution suggest that gun ownership confers substantial enjoyment to consumers in the United States. Although the vast majority of purchased firearms are not used in violent crime, the toll of gun-related injuries is high. In 2020, there were more than 45,000 gun-related deaths in the United States. Our research develops a framework for evaluating gun policy that simultaneously respects the individual enjoyment of gun ownership and takes seriously the harm caused by guns.

Our research provides estimates of how alternative firearms regulations affect both overall gun sales and the types of guns in circulation; the latter may matter because different types of firearms are associated with different crime rates. We estimate demand for firearms, allowing for consumers to switch between gun types as prices change. Our demand model also allows for individuals to differ in their preferences for firearms. We leverage our estimates of consumer price sensitivity and switching behavior across different firearms to estimate the effects of price- and quantity-based regulations that have never been implemented (e.g., a ban on handguns). This framework can help a policymaker evaluate how well different policies can achieve their intended goals and at what cost to gun owners. Our estimates can also be used to put bounds on the cost of a hypothetical firearm buyback program.

Our research does not estimate a causal link between gun ownership and crime or deaths. Instead, it estimates the effects of policy on both the number and types of guns sold, as well as the enjoyment that accrues to gun owners from their purchases. Our framework allows policymakers to combine their prior beliefs about the causal link between guns and crime with our estimates to evaluate the expected costs and benefits of possible regulations. If

a policymaker believes there is no causal link between the number of guns and gun deaths, our framework can still be helpful, as estimates of consumer enjoyment shed light on the cost of gun policies to gun owners.

The dearth of data on the volume of firearms sold and their corresponding purchase prices is a major challenge in estimating demand in this market. To our knowledge, no centralized database contains information about either individual-level or aggregate gun purchases matched with prices. Proxies for purchases that have been used in previous research—such as background checks and the share of suicides committed with firearms—are neither detailed to the gun model nor matched with prices. In fact, regulation restricts how certain government agencies collect, process, and share data on firearm ownership.

We addressed this data availability challenge by conducting a stated-choice-based conjoint analysis. This type of survey is used in marketing to forecast demand for new products where no sales data are available. The survey presents respondents with a sequence of choices between alternative firearms. In the survey, we experimentally manipulated prices and choice sets, allowing us to infer the way that respondents trade off different product attributes.

Our demand analysis yields three important findings. First, consumers are relatively price insensitive, but the demand for handguns is most price sensitive. Second, when prices change, there is considerable switching from semiautomatic rifles and shotguns (often labeled "assault weapons") to handguns, but little switching in the reverse direction. Finally, potential first-time gun owners are more price sensitive and have a stronger preference for handguns relative to repeat buyers.

We validated our demand estimates with two sources of aggregate data: data on background checks from the National Instant Criminal Background Check System and data on prices and out-of-stock gun models from GalleryofGuns.com. Our model predicts just over 37 million gun purchases in 2020, remarkably similar to the 39.7 million background checks processed by the FBI that year. The model also predicts that handgun sales account for about 65 percent of gun purchases, which is again similar to the observed share of background checks that were for handguns in 2020 (60 percent). Finally, our estimated price sensitivities suggest that retailers may be setting prices "too low" from the perspective of profit maximization. Data from GalleryofGuns.com indicate a high frequency of out-of-stock gun models, consistent with this observation.

We next turned to estimating the effects of alternative policies on the market for firearms. We considered an assault weapons ban, a handgun ban, and a tax that increases the price of all firearms by 10 percent. We find that an assault weapons ban would induce many consumers to switch to handguns and would induce only a minimal reduction in the overall number of firearms sold. A handgun ban, on the other hand, would substantially reduce the number of guns sold. The reason for this asymmetry is that many consumers who are in the market to buy a handgun do not consider purchasing a long gun at all, while many consumers who consider purchasing a long gun are also interested in buying a handgun. Finally, because consumers are relatively price insensitive, we estimate that a 10 percent price increase leads to a small reduction in sales.

Our estimates also allow us to compute the effects of hypothetical policies on consumer surplus, which measures the benefit that consumers enjoy from buying a gun net of the purchase price. These estimates can help us understand the underlying economic cost of different policies to participants in the firearms market. In addition, these estimates may help provide context to the political and fiscal difficulties of enacting policy. For example, we find that a handgun ban affects more consumers than an assault weapons ban, and consequently that it leads to a bigger reduction in aggregate consumer surplus; however, there is a considerable mass of handgun buyers who lose very little surplus under a handgun ban.

These consumer surplus numbers are also helpful in conceptualizing the potential cost of a gun buyback program. A primary challenge in regulating the gun market is that guns are long-lasting products; an estimated 400 million guns are in circulation in the United States, and those firearms could be bought or sold in secondary markets. New Zealand spent $102.2 million on a mandatory buyback for semiautomatic firearms and military-style weapons in 2019, but we know of no estimate for the cost of a similar or expanded program in the United States. We estimate the cost of buying back recent gun purchases, focusing on

guns that our model predicts would be purchased in the next year. We find that the overall consumer valuation of firearm ownership is quite large. Our estimates imply that averting 90 percent of gun sales over the next year would cost approximately $6,499 per gun.