

Minimum Energy Efficiency Standards for Appliances: Old and New Economic Rationales

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Executive Summary

A focus on consumer rationality and consumer choice has been prominent through much of the discourse surrounding whether or not minimum energy efficiency standards for appliances are justified from an economic perspective. Some have argued that bounded rationality, information asymmetries, and the seemingly high discount rates that consumers appear to apply to the appliance purchasing decision, a phenomenon broadly defined as the Energy Efficiency Gap (Jaffe and Stavins 1994a), are justifications for standards (e.g., Howarth and Sanstad 1995; Levine, Hirst, Koomey, McMahon, and Sanstad 1994). Others have argued that consumers are in fact making choices that are rational and do maximize their private benefits, and that standards restrict the choice set offered to consumers and must therefore negatively impact consumer welfare (e.g., Gayer and Viscusi 2013). Although this debate is still relevant, we believe it is time to broaden the conversation to include market failures on the supply side of these markets. The actions of supply-side economic agents, like manufacturers and retailers, might ultimately have greater implications for the welfare outcomes of standards than consumer behaviors and preferences alone. The very nature of the choice set faced by consumers has an important role in the choices consumers make, and may well be strategically designed to

take advantage of information asymmetries or play off of cognitive (e.g., bounded rationality) or systemic (e.g., split-incentive) biases present in the market. In sum, market failures on the supply side of the market, and their potential interconnection with imperfect information or bounded rationality of consumers, have important implications for regulation that have been under-emphasized in the literature to this point.

Around the time that minimum energy efficiency standards for appliances were first introduced in the U.S., Hausman and Joskow (1982) outlined what they viewed to be the main economic rationales for appliance standards. In this article, we revisit Hausman and Joskow (1982) and provide further insight and new discussion regarding the four market failures they highlight as justifications for standards: energy prices below marginal social cost, consumers underestimating energy prices, consumer discount rates above social discount rates, and principal-agent problems. In light of the need discussed above to shift the conversation around standards to include a greater emphasis on the supply side of the market, we discuss two additional market failures: market power and innovation market failures. While many others have discussed these two market failures in the context of energy efficiency policy generally (e.g., Fischer 2004; Gillingham, Newell, and Palmer 2004, 2006; Allcott and Greenstone 2012; Gerarden, Newell, and Stavins 2015), we feel they deserve further emphasis in the context of the appliance market in light of recent empirical evidence. Recent work suggests that the behaviors of firms operating in the appliance market make a particularly interesting case for minimum standards.

This shift of perspective is motivated by recent empirical findings. Some of these findings bring to light a puzzle. Specifically, appliance prices have followed downward

trends and the introduction and revision of standards appear to accentuate these trends. Simultaneously, the quality of appliances has been increasing over time, including over periods of increasingly stringent standards, even in dimensions outside energy efficiency.

With regard to the four market failures originally discussed by Hausman and Joskow (1982), first we argue that, unlike following the 1970s energy crisis, when it was clear that U.S. subsidized energy prices were below market prices, current regulatory distortions may have the opposite effect. The argument that today's energy prices are below marginal social cost is less convincing and unlikely to be the main economic rationale for appliance standards. Second, the question of whether consumers underestimate energy prices or have elevated discount rates above market returns are both cases with additional mixed results coming out of recent research, and no clear conclusion. However, we do note that there is evidence of heterogeneity in consumer discount rates, and allowing for this in future research is valuable in light of the interactions between the heterogeneity of consumer preferences for energy efficiency and the market power market failure we discuss. Finally, we conclude that, given the lack of a credible signal of rental unit appliance efficiency in the U.S., the evidence from recent research supports the presence of a principal-agent problem, at least in the residential rental market, which can be addressed through minimum efficiency standards.

Shifting the focus away from consumer perceptions or preferences alone, recent research suggests that market power and innovation are likely important factors that have normative implications for minimum energy efficiency appliance standards, particular when taken in combination. While minimum standards would not be the first-best policy for addressing either one of these supply-side market failures in isolation, in theory they

can be a welfare improving policy intervention. We believe that a stronger case for minimum standards might be made by taking into account the interconnected and dynamic aspects of these supply-side market failures, together with their interaction with the demand-side market failures. However, much more needs to be understood about the economic magnitude and interaction of these market failures in a dynamic setting to fully understand the welfare implications of minimum standards in the U.S. appliance market.