Taxing Plastic, Changing Packaging: The Impact of Pigouvian Taxes on Sustainable Packaging Adoption in the FMCG Industry

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Introduction

Production costs often have a huge impact on the type of packaging used by producers. Usually, to incur lower production costs, producers packaging FMCGs (Fast moving consumer goods) use single use plastics and other non-biodegradable materials (Jain & Hudnurkar, 2022). These have a consequence on the planet since these packages are usually not reused or recycled, and so they end up in landfills. By choosing a cheaper alternative, producers compromise on the sustainability of these packages (Schaltegger, 2011). Since consumers also prefer lower prices and convenience, they pick brands that offer them this, rather than those that promise them more eco-friendly products.

The discipline of this research is industrial economics, which is the study of the structure, behavior and performance of firms and markets. The thematic focus is production cost and economic feasibility with sustainability as a long-term outcome of the research (Wikina et al., 2010). Production cost and economic feasibility refer to the way firms make decisions, analyzing their cost structures and profit margins.

The choices in industrial economics as a discipline is significant because it analyses market failure and the need for government intervention. Furthermore, exploring policy tools such as subsidies, sanctions and Pigouvian taxes (Jocelyn Blink & Ian Dorton, 2020) can correct this externality (Pearce & Turner, 1992). Research on this theme is crucial since rising plastic pollution has consequences on both the environment and our community.

There can be multiple ways to incentivize producers to move towards more sustainable packaging, such as implementing penalties on those who do not change their packaging. Additionally, it is necessary to show them that changing their packaging can be more economically suitable for them, rather than having to pay these penalties. The same will also allow consumers to choose according to their convenience, yet all their options are sustainable. This will lead to lower waste levels, a more efficient use of nonrenewable resources and a decrease in environmental consequences (Klemm & Van Parys, 2012). Such government intervention will be effective since it aims to internalize the externality, aligning the private costs with the social costs.

This problem depicts the tragedy of commons since overexploitation of shared environmental resources leads to long term consequences. Further, the problem of asymmetric information arises when consumers are unaware of the consequences of their purchases because they do not know what packaging they consume comprises of. This paper argues that implementing taxes and penalties on unsustainable packaging is more effective than voluntary corporate actions since it reduces plastic waste and maintains consumer accessibility.

Background and Significance

A study shows how 45-50% of global plastic waste is accounted by packaging and 60% of all plastic used in packaging is only used once before disposal (Feitelson, 2003). This problem has a huge impact on the environment because they are used for a very short period of time, they end up causing land pollution and other consequences very quickly (Pearce & Turner, 1992). It represents negative externalities of production, because the marginal social costs are not reflected in the marginal private costs, leading to overproduction of unsustainable packaging.

Since producers often aim to minimize production and transportation costs, they use lighter, cheaper, non-biodegradable packaging. This thematic explores the conflict of balancing short term economic sustainability and long-term environmental sustainability, due to which firms prioritize financial gains

unless there are other consequences are imposed. (Boz et al., 2020; Srinivasan & Lu, 2014).

Literature Review

Studies on this theme have been conducted by several researchers. (Schaltegger, 2011) discussed that sustainability is a driver of economic success in corporates only if appropriate policy frameworks are in place. Moreover, (Klemm & Van Parys, 2012) provide evidence that tax incentives affect decision making significancy, conveying how proper economic sanctions can shift producer's choices without reducing profitability significantly and making their decisions more sustainable.

(Tencati et al., 2016) explores the growing challenge of packaging waste contributing significantly go solid waste un numerous industrialized countries. Even though the European Union has introduced several recycling and waste management policies aimed at improving waste management outcomes, they have not succeeded in the reducing the amount of packaging waste that is being generated. The study argues that this is the principal cause behind the shift in focus towards prevention policies, which are now at the top of waste hierarchy.

Through a comparison between 11 countries, the study identifies trends in packaging waste prevention policies such as eco design and life cycle thinking, which encourage companies to reduce the volume of material used. Furthermore, the policies also aim to raise consumer awareness using tools such as eco-labels and information about carbon footprint to encourage them to choose products that are sustainable and generate lesser waste. Finally, the authors highlight the crucial role collaboration across industries in the packaging supply chain play, through policies, voluntary agreements and economic sanctions (García-Arca et al., 2014).

Sustainable packaging includes packaging solutions that minimize the consequences this packaging has on the environment across its life cycle, including reduced usage of materials, higher recyclability and reusability and lower carbon emissions (Afif et al., 2021). Policy instruments like subsidies or Pigouvian taxes than influence the firms' behavior help reduce the negative externality created by this unsustainable packaging that causes waste generation, pollution, etc (Pearce & Turner, 1992). Incentives must encourage innovation and sustainable packaging designs rather than simply recycling.

Packaging decisions are based on not only firm choices but cost minimization and market competition. Adding sustainability to this discipline allows simplify the analysis of the packaging that is being considered based on resource conservation, environmental efficiency, etc. The combination of industrial economics and sustainability is crucial for the FMCG sector since standardized packaging is valued over environmental impact of the producer's choices. For instance, literature (Tencati et al., 2016) explains how economic instruments must be embedded in regulatory frameworks, rather than being seen as voluntary actions, so that they are successful in influencing firm behavior. (Jain & Hudnurkar, 2022).

Research on this thematic started due to environmental economics debates on waste management. The first important discovery on the same was Arthur Pigou's 1948 work which introduced the idea of Pigouvian taxes as a way to correct negative externalities. Even though this was for carbon emissions, it established a basic framework for waste management policies in the future. The second significant event occurred in 1990 with the creation of Extended Producer Responsibility and other related policies in Europe. Germany and France introduced packaging that reduced post-consumer packaging waste and shifted responsibility from municipalities who performed recycling to the producers and users. This was also a way to recognize creative solutions that reduced waste generation such as the compliance scheme of Duales System Deutschland. (Andreassen et al., 2024; Friedrich, 2020; Pearce & Turner, 1992).

A recent moment was when in 2010 policy attention shifted once more from recycling to prevention. Policymakers encouraged eco-design and life-cycle assessment alongside packaging optimization as a cost-effective strategy. (Tencati et al., 2016) highlight this by comparing prevention policies with eco

modulation as an economic instrument. These policies show how over time, governments shifted from forcing producers to pay Pigouvian taxes to incentivizing them to reduce post-consumer waste to finally aim to reduce the packaging problem at the source (Afif et al., 2021). Economic feasibility of sustainable packaging, including production and transportation costs, as a thematic has faced contemporary debate which reveals two main schools of thought. The first advocates for market-based instruments including Pigouvian taxes and EPR sanctions. They believe that price signals encourage firms to adopt sustainable packaging by making the unsustainable options more expensive. This is because taxes aim to correct welfare losses caused by negative externalities. By increasing producers' costs, Pigouvian taxes shift the production closer to a socially optimal level, reducing the welfare loss. On the contrary, the second school emphasizes on voluntary agreements through incentives to increase cooperation between firms and governments rather than imposing burdens (Siagian & Sinaga, 2024). These approaches are preferred by firms because they involve lower costs, reduce regulatory burden and are more flexible when it comes to implementation and requirements.

The primary point of contention is the economic efficiency versus regulatory flexibility. Market based instruments are economically efficient and scalable. However, they increase production costs and prices for consumers and are also seen as forced upon the producers (Andreassen et al., 2024). This reliance on price signals does not account for dynamic efficiency because firms's flexibility to experiment with packaging can be restricted by rigid taxation. Contrarily, voluntary approaches are more flexible and open to innovation. Though, these face weak enforcement and are not as efficient as the other (Klemm & Van Parys, 2012) . Furthermore, the power dynamics between governments and firms differ for these two. While these voluntary approaches allow firm-specific adaptation, they fail to correct market failure effectively because there is lack of incentive to internalize the externalities.

Recent dialectical writing has suggested that these approaches are not successful in isolation. Studies conducted in France and Belgium show that eco-modulates fees, which are based on the idea of regulation without restricting firm flexibility successful incentivize weight reduction and increase recyclability of packaging (Wikina et al., 2010). On the contrary, purely voluntary systems such as agreements have limited impact unless that are backed by incentives. (Tencati et al., 2016) explore how schemes that control packaging are more efficient in prevention, also allowing cost savings. When this comes into practice, Pigouvian taxes on non-recyclable materials can incentivize producers to shift to mono-material packaging which is easier to recycle and reuse. Furthermore, more specific policies can push producers to reduce material weight, as well as the volume of substance used in the packaging. These incentives, back by economic consequences, will stimulate innovation that allows producers to invest in materials that make sustainability economically viable (Afif et al., 2021; Aghion et al., 2016).

A limitation of both these is that market-based instruments depend on accurate measurement of environmental impacts, due to which they oversimplify the life cycle of both biodegradable and non-biodegradable packaging while voluntary approaches risk free-riding since there is lack of long-term commitment (Boz et al., 2020). Both schools treat all firms as one, overlooking differences in their choices, behaviors, priorities, technological capacities and cost structures.

Although extended producer responsibility schemes and other market-based instruments are very common, there is limited firm-level evidence on how specific economic incentives such as Pigouvian taxes affect producers' packaging choices and economic feasibility within the FMCG industry (Klemm & Van Parys, 2012). Recent literature continues to highlight this gap. For example, studies on sustainable packaging decision making show that firm-level responses are unexplored. Life cycle assessment (LCA) in recent years focuses on environmental impacts rather than outcomes; which leads to a disconnect between the sustainability and economic feasibility of packaging. This is a critical problem since overlooking the firm-level differences leads to ineffective policies with no substantial

outcome and disproportionate burden on smaller producers (Wikina et al., 2010). These smaller producers might go into extinction due to their limited capacity, and the reduced competition will further discourage innovation.

This gap has persisted over time because of methodological challenges when it comes to implementation. Firm level cost data in the FMCG sector is proprietary, which leads to lack of transparency.

Research Question

To what extent does the introduction of a Pigouvian tax influence producers' adoption of sustainable packaging in the FMCG industry, and how does this affect firm-level profit margins?

Argument

Based on the trends visible in the FMCG industry, producers seem to be more responsible to market based policies and economic incentives that directly affect costs, rather than voluntary sustainability commitments or advisories. While most producers promote eco-friendly packaging through their corporate social responsibility (CSR) initiatives, these are often limited since they focus more on increased production costs and price competition (Schaltegger, 2011). Due to this, there is a high chance that financial signals that are rooted in government policies such as Pigouvian taxes on environmentally harmful packaging may be more influential in a change in producer behavior than voluntary mechanisms (Andreassen et al., 2024). For instance, the Plastic packaging Tax introduced in the UK in 2022 has led to a measurable increase in the use of recycled plastic content. Industry reports have been successful in indicating that many firms adjusted their packaging to meet the 30% recycled content requirement, to avoid the tax. This is a clear behavioral response to the cost based incentive.

However, there are strong possibilities that this change is not uniform across firms. Larger FMCG producers have greater financial and technological capacity, and so these shifts might be easier to adapt-to for them, rather than smaller firms that will experience strains for the same. This leads to the hunch that Pigouvian taxes can incentivize sustainable packaging adoption, but their effectiveness depends on firm-level feasibility and capacity (Lin et al., 2023; Srinivasan & Lu, 2014). To address this heterogeneity, it is important to have hybrid policies such as tiered taxation or subsidies for SMEs (small and medium enterprises). Transitional schemes will help reduce the disproportionate burden on smaller firms and help lead to the impact of the Pigouvian tax being more effective.

The introduction of a Pigouvian tax on unsustainable packaging will significantly increase the adoption of sustainable packaging in the FMCG sector, if the policy is designed in a way that it is feasible to adopt. This is because producers in the FMCG sector face a highly competitive market and so cost minimization is essential to them (Aghion et al., 2016). Thus, policies affecting the cost of these will influence the firm behavior. The policy, if implemented correctly, will raise production costs further than the change caused by shift towards sustainable packaging, making the latter more attractive to the producers (Aghion et al., 2016; Pearce & Turner, 1992). This will effectively shift the MPC (marginal private cost) closer to the socially optimum level of consumption, correcting the overconsumption and reducing the negative externality by decreasing the welfare loss.

Existing literature in industrial economics such as (Aghion et al., 2016) has shown that market-based instruments such as taxes are proven to be effective in correcting negative externalities. Pigouvian taxes, especially, reflect the welfare loss caused by environment damage, and aim to align private incentives with social welfare. Furthermore, studies on extended producer responsibility such as the Eco-modulated EPR fees in France showcase that firms being held financially accountable for packaging waste leads to reduced material usage and investment in more sustainable packaging (Friedrich, 2020). Countries that have introduced plastic taxes also indicate significant declines in the use of plastic consumption, and an increase in the demand of substitute materials. An example of the

same is UK's Plastic Packaging tax, which has forced consumers to reduce their packaging to have less than 30% plastic.

This means that in a highly competitive market, such as the FMCG sector, firms behave as cost minimizers, and only policies that affect their production costs directly lead to changes in their packaging decisions. Voluntary commitments remain secondary, particularly if they reduce profitability. They choose sustainable packaging as a cost-efficient alternative to the taxation. A key counterargument to this is that economic instruments that mandate firm's actions reduce their autonomy (Klemm & Van Parys, 2012). It can also lead to extremely high costs that small and medium sized firms cannot bear. Additionally, critics state that voluntary commitment as a part of corporate social responsibility are more flexible and have minimal burdens on the consumers. Even though this is a valid concern, most of these voluntary approaches so inconsistent and close to no results across the FMCG sector (Andreassen et al., 2024; Boz et al., 2020). Many firms adopt these policies only to the extent that it does not affect their profitability.

Conclusion

In conclusion, pigouvian taxes on the other hand creative universal and effective incentives for all producers. They influence the cost structures in the highly competitive FMCG market, thus making sustainable packaging the rational economic choice. These findings have important implications for policymakers because they suggest that sustainable policies must extend beyond voluntary guidelines. It is imperative that they prioritize cost based regulatory frameworks in order to internalize the externality. Pushing recyclable, bio-degradable packaging beyond an ethical consideration allows widespread implementation of environment friendly packaging universally, regardless of firm heterogeneity. This will push the policy focus and in turn not only improve effectiveness, but also long term innovation for packaging in the FMCG sector.

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