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Research Article

Influence of the European Union (EU) on International Maritime Organization (IMO) about the Market-based Measures on Emissions

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Abstract

Market-based Measures (MBM), a catalyst for new and effective technologies, can be advantageous for the shipping industry on its way to reaching 50% decarbonization by 2050. MBMs are the focal point at the decision-taking level for the International Maritime Organization (IMO) and European Commission (EC) to regulate emissions and improve energy efficiency in the maritime transportation industry. EC included shipping into European Union's (EU) existing Emission Trading Scheme (ETS). However, IMO's scheme will be functional after 2023, and the decision of an MBM is not finalized yet. The motivation of this paper is to analyze viable MBMs under the Initial IMO Greenhouse Gases (GHG) Strategy based on their superiority and evaluate the influence of EU policy implementation on the global shipping industry. The issues such as economic implications, feasibility, social and environmental responsibilities, and harmony of the policy are included in the paper to assess the success of the MBMs. Main concerns and thoughts revolving around EU ETS; such as economic implications of taxation, the existence of an administrative body for shipping in EU ETS, carbon leakage caused by high tax, voyage evasion of emissions by not delivering goods to distant areas, the emergence of a fraud-proof and more secure system with an administrative body, success factors of EU ETS after 16 years, full certainty of reducing emissions rather than incentives to reduce emissions, monitoring, and reporting schemes; are discussed to bridge the issue with EU's reasonings.

Keywords: Environmental Protection, EU, IMO, ETS, MBM, Decarbonization, Carbon Tax

Introduction

The transportation industry is responsible for 14% of global anthropogenic emissions (Avetisyan, 2018). Maritime transportation has the most significant share in mode preference and third in rank of contributors of greenhouse gas emissions among transportation modes (International Maritime Organization [IMO], 2021; Ülker et al., 2021; Bayırhan et al., 2019; Bayırhan and Gazioğlu, 2021). In the course of the Paris Agreement, industrial production and land transportation were the main targets. Nowadays, maritime transportation started to get limited by the policies as well. By early 2021, there were 99,800 ships in the world that were bigger than 100 gross tonnages, and those had 2,134,639,907 deadweight (dwt) capacity to carry goods (UNCTAD, 2021). In 2020 estimated cumulative delivery of the newbuildings was 88.7 million dwt with a decrease of 9.1 million dwt compared to last year, primarily due to the pandemic, while ships with 19.9 million dwt capacity were sent to demolition (Barry Rogliano Salles, 2021). The 68.8 million dwt deficit between new and demolished ships will contribute to 2.89% anthropogenic Greenhouse Gas (GHG) emissions of maritime transportation (IMO, 2021; Mersin et al., 2019-2020).

In this paper, the decision of the European Union (EU) to include shipping into the Emission Trading Scheme (ETS) is discussed thoroughly. Evaluations are revolved around two research questions. The first question is which Market-Based Measure (MBM) is favored most in the literature? The second question is to which extent can the decision of the EU affect the global maritime industry? Overall, MBM literature is relatively narrow, even though possible implementations are either approved or on the way (Chai et al., 2019; Psaraftis, 2021). That said, Psaraftis (2021), briefly assessed the prospects for the future of shipping decarbonization in the aftermath of the 76th meeting of the Marine Environment Protection Committee (MEPC), a committee of the IMO. Yet, the European Commission's (EC) decision on MBMs is not analyzed in-depth in that paper. This paper aims to fill the gap in the literature, which is, evaluating the EU's possible influence on the IMO's decision on MBMs within the context of the superiority of previously proposed MBMs. The evaluation necessity for such clarification arises from the following issues. The EU is integrating shipping into their current ETS, but the scheme may not be operational globally due to the difficulties it will create, such as carbon leakage or voyage evasion. Also, a decision on the EC level will have gravitational effects on shipping due to the high-density trade volume in EU ports. Even with a 7% loss, EU ports handle 3.3 billion tons of goods in gross weight annually (EC, 2021a).

European Union and Environmental Protection

The EU has gradually developed an extensive environmental legislative framework (for the protection of the earth, the seas, and the atmosphere) which is also of binding nature for the member states and the candidate countries. As a result, particularly the maritime transportation sector has been greatly affected by these steps taken by the EU institutions and the policymakers. Indeed, these new supranational regulations prepared by Brussels are harmonious with the existing international-global regulations (for example, IMO conventions), but they develop them further for the EU member states (and candidate countries) and bring new standards and additional regional and binding rules for maritime transportation sector representatives, particularly with regards to environmental protection.

In this context, in 2009, the EC has started the ambitious long-term "zero-waste, zero-emission" objective for the maritime transportation sector in Europe. With this call, the EC has reaffirmed its intention to table draft legislation to cut GHG emissions from ships. To achieve this long-term goal, the commission also proposed to strengthen the EU legislation on ship waste disposal at port facilities and improve its implementation. The commission also underlined the importance of a European environmental management system to monitor improvements in the maritime sector's environmental performance.

The main priorities of the EU's proposed Zero-Waste and Zero-Emission Policy are:

- Ensuring steady progress towards a coherent and comprehensive approach to reduce GHG from international shipping, combining technical, operational, and market-based measures.
- Actively working in the IMO to pursue the limitation or reduction of emissions of GHG from ships.
- Ensuring that the Member States are able to achieve "good environmental status" in marine waters covered by their sovereignty or jurisdiction by 2020, as required by the new Marine Strategy Framework Directive.
- Strengthening EU legislation regarding port reception facilities for ship-generated waste and cargo residue, improving the implementation arrangements. In that regard, ensuring both the availability of adequate facilities and administrative procedures to meet the expected traffic growth.
- Ensuring the adoption of the IMO Convention on Ship Recycling and its future implementation.
- Overseeing the smooth implementation of the amendments adopted by the IMO in October 2008 to MARPOL Annex VI to reduce sulphur oxides and nitrogen oxides emissions from ships. This includes assessing which European sea areas qualify as Emission Control Areas, the availability of the adequate fuels and the impacts on short-sea shipping.
- Promoting alternative fuel solutions in ports, such as the use of shore-side electricity.
- Re-launching the Commission's 'Quality Shipping Campaign', by means of partnership agreements with the EU maritime administrations, the maritime industries at large and the users of maritime transport services.
- Promoting a European Environmental Management System for Maritime Transport, targeting the continuous improvement of the environmental performance of shipping; modulation of registration fees, port dues and other charges, with a view to rewarding efforts towards greener shipping (EC, 2009).

The EU's proposed Zero-Waste and Zero-Emission policy was a major step in developing environment friendly maritime transportation services in the European continent. It can be considered as a European Constitution (a binding major supranational guideline) for environment friendly maritime activities for the member states and the candidate countries (Kirval and Kiliç, 2011, 181). One recent development has been the EU's inclusion of the shipping sector into the ETS in this context.

Market-based Measures

IMO's Initial GHG strategy was adopted in 2018, which probably will include one or more medium-term measures as a candidate of practices to make the market more willing to transform into a cleaner industry. Those practices will be in exercise in the time window of 2023 to 2030. IMO's strategy consists of a range of technical and operational measures to tackle emissions (IMO, 2018). Stimulations of the strategy could include an MBM that can speed up the process by pushing shipowners to break traditional patterns of excessive reliance on bunker fuels that releases immense amounts of GHG emissions and air pollutants into the atmosphere (Christodoulou et al., 2019).

MBMs use the "polluter pays" argument, which means they internalize pollution's unfavorable external environmental effect by asking the polluter to compensate for it. Samples of MBMs could be listed as environmental taxation, ETS, various offsetting mechanisms, and provision of subsidies. MBMs are forcing stakeholders to choose among the pool of tools to minimize the payment of their emissions, which enables them to find the best suitable one for themselves (Lagouvardou et al., 2020).

After President of EC, Ursula von der Leyen revealed her intent at European Green Deal announcement to make Europe first carbon-neutral continent in the world by 2050 and European Parliament's (EP) voting in September 2020 to include shipping into the EU ETS. It is not a surprise that ETS will be the first MBM to reduce GHG emissions emitted by the maritime transport industry. The scheme will be regulating all intra-EU

trips, 50% of CO_2 emissions from trips between non-EU and EU ports, and all at berth EU ports CO_2 emissions with the same rules on auctioning, transfer, surrender, and cancellations of allowances, penalties, and registries that applies to other sectors within EU ETS (EC, 2021b; EC, 2021c; Psaraftis, 2021).

Studies on MBMs

Various sub-types of the carbon tax and ETS have been proposed at the IMO. The International Greenhouse Gas Fund (MEPC 60/4/8), Leveraged Incentive Scheme (MEPC 60/4/37), and Port State Levy (MEPC 60/4/40) are similar to the carbon tax, while the Global Emission Trading System (MEPC 60/4/22, MEPC 60/4/26, MEPC 60/4/41, MEPC 60/4/54) are similar to ETS (Chai et al., 2019).

In terms of MBMs mainly these four have been standing out: (1) GHG Fund Bunker Levy, (2) Global ETS, (3) Port State Leverage (PSL), and (4) Rebate Mechanism (RM). Bunker levy means money collection from fuels that are sold. Money generated in such a system will be the funding of abatement of GHG emissions. Global ETS indicates a cap and tax system where market actors will be enabled to sell/buy credits and stay within their designated limits. A PSL is a collection of monies from ships as she arrives at a port based on a calculation of how much fuel she consumed on the selected voyage. PSL is going to be a standardized emission charge on a ship when she arrives at ports based on the consumption of fuel on her voyage. This way, speed reduction will be imposed directly, and it is rewarding for ships that are energy efficient. Lastly, first expressed by the International Union for Nature Conservation, RM rewards the states that go well within the carbon tax scheme, which calculates a country's share of global imports by value (Lema et al., 2017; Psaraftis & Lagouvardou, 2020).

Studies Favoring Bunker Levy

Lagouvardou et al. (2020), did a comprehensive literature review on the issue and examined various subjects and tools. Most discussed measures of MBM's can be listed as rebate mechanisms built into the GHG fund system, global maritime ETS, and bunker levy. Since it has more applicability within its flexible and easy-to-monitor nature, bunker levy ideas have stood out more than other measures. Implementing a levy on bunker fuels could be one of the most simplistic ways of assessing an MBM since shipping firms will react proactively to a known rise in fuel costs (Chai et al., 2019). Several options can be optimized in such bunker levy or a carbon tax scenario. GHG Fund, pure levy on bunker fuel (low, medium, and high levels of bunker price surcharge) or CO_2e (CO_2 equivalent) emission taxes or variants, applying fuel tax on selected low energy efficiency operating ships, levies and on a regional basis selling fuels with taxes could be listed as examples.

Lema et al. (2017), tested proposed MBMs in the fuzzy logic model and said a levy is superior in terms of cost to ETS. According to the study, a comparison shows that ETS and bunker levy will probably be the most effective in tackling emissions. PSL and ETS will be expensive and hard to apply for various reasons, such as the need for a regulatory body or technological implementation. In contrast, GHG funds and RM, owing to their elementariness, will be less costly (Psaraftis & Lagouvardou, 2020). US Congressional Budget Office (CBO) (2008), compared ETS with levy scheme. Ease and the same environmental impact with the half of the cost of a global ETS at implementing, made levy decision superior for them.

Giziakis and Christodoulou (2012), measured awareness levels of Greek shipping companies towards possible GHG reductions policies via survey method by using a questionnaire, namely Energy Efficiency Design Index (EEDI), Energy Efficiency Operational Indicator (EEOI), a global levy, and ETS. Their results show that companies were not enthusiastic about a global levy idea since it would increase cost and not boost R&D for the maritime sector as EEDI would. Even though compared with ETS, their approach was warmer to levy, which they believe to be more effective to reduce emissions and easy to operate. Tanaka and Okada (2019), unfolded an optimal control model that calculated possible policies. As a result, they favored CO_2 tax with the direct subsidy for effort to improve the fuel efficiency of ships funded by the revenue from the emission tax instead of direct emission tax. The work of Kachi et al. in New Climate Institute (2019), compared three MBMs, offsetting scheme, ETS, and a climate levy. They favored climate levy over other ways by implying by 2030, the levels of levy should be on robust levels to lead transporters to leave fossil fuels. Chai et al. (2019), decided to compare bunker levy with ETS via multi-criteria analysis. Eventually, they favored bunker levy to cut emissions regardless of its collection method, incentivizing technology adoption with high Technology Readiness (TRL), low TRL technologies investment, and generating funds. BHP et al. (2019) made a report on what type of carbon pricing scheme should be applied to the maritime industry to reduce GHGs. They argue that levy is a more transparent mechanism, fundamentally sound, and will contribute from step one with abatement compared to ETS. Gu et al. (2019), investigated Maritime ETS (METS) with scenarios and proposed an optimization model integrating the fleet composition and deployment problem with the METS. Their tested scenario code includes regional, global, and BAU in terms of coverage, low and high bunker price, low, normal, and high charter rate and zero, low and high allowance price. Christodoulou et al. (2021), compared MBMs and found both (GHG Fund and METS) promising for the future. However, due to volatile market conditions, they do not see METS as more efficient than a levy.

Shi (2016), says it is highly possible that add-on RM built to a global GHG Fund type of MBM is optimal and acceptable by most States. Cristea et al. (2013),

compared data on trade, transportation mode, transport emissions, and output emissions to calculate the contribution of transportation to trade-related GHG emissions with different policies such as ETS (global and national-cap systems) and carbon tax. Their likings on a levy as well in a perspective that cap-and-trade policies would be hard to imply over states whereas their 50 US dollars carbon tax for instance worked fine. Wang et al. (2019), discussed a typical tramp ship routing and scheduling in the context of MBMs and took levy and ETS into account. Sixteen benchmark instances for routing have been tested by imitating bunker levy, and decision modeling was taken from SINTEF Ocean. The operator's response was accepting fewer optional cargoes, slowing down the ship, and operating in a way that produces less CO_2. International Monetary Fund (IMF) claimed that if a reasonable minimum global tax applied to the market, this case would favor rather than having such ETS. Also, IMF's reasons to choose bunker levy instead of other measures are that bunker levy gives certainty over prices and is applicable for all ships existing and new (Parry et al., 2018).

Friends of the Earth (FOE) (FOE, 2009; 2010), in two reports had a similar stance. FOE listed deficiencies of ETS as ineffective to drive emission reductions, it fails to drive technological innovations, can lead to high-carbon infrastructure, it allows and relies on carbon offsetting, can create a risk of a sub-prime carbon, and it is a smokescreen to take financial action against climate change (Psaraftis, 2012). High-level Advisory Group on Climate Change Financing (AGF, 2009) and International Transport Forum (ITF/ OECD, 2018) implied that fewer people to tax would diminish the need for an administrative burden with bunker levy. International Chamber of Shipping (ICS, 2018) stated that bunker levy is not complicated and less likely to cause market distortion.

Studies Favoring Emission Trading Scheme

In support of an ETS, Miola et al. (2011) conducted research on MBMs, came up with three models and concluded in a suggestion of a global ETS only for shipping. Faber et al. (2009), prepared a technical support report for EC. The author claimed that, rather than applying an emission tax, ETS implementation would be more beneficial in reducing emissions since the primary policy objective of the approach will be reducing emissions.

Ellerman et al. (2010), has published on the pro-ETS side. They think that thanks to the success factor of EU ETS, ETS has the potential of becoming a prototype for a global climate policy regime, even with a few glitches that need to be fixed. Kågeson (2011), is claiming that level of bunker levy should be high if the ecological return is expected and honor all the objectives proposed by Cyprus, the Marshall Islands, Denmark, and Nigeria in the original draft (MEPC 60/4/8) (IMO, 2010).

Studies in Gray Zone

Psaraftis (2012), compared MBMs among each other with their advantageous and disadvantageous points in his work. The author did not conclude the research with a speech about the best MBM. Lema and Papaioanou (2013), focused on the need for an MBM rather than choosing the most suitable MBM. In addition, the authors said shipping is already highly regulated, and policymakers should show utmost care.

European Union's Reasoning of the Decision

Thoughts and reasoning surrounding the ETS decision can be evaluated in four sections from the policy perspective. Economic implications, feasibility, social and environmental responsibilities, and harmony of the policy can be signified as the main concerns for this specific policy. The further discussions are made in the next sub-titles.

Economic Evaluation – Existing Administrative Body and High Taxes

In their report, World Bank and Ecofys (2018) mention that two mechanisms function in various areas in many parts of the world at national and sub-national levels. In this approach, a carbon pricing scheme can regulate 11 gigatons of CO_2 equivalent (CO_2e) by 2020, one-fifth of annual GHG emissions. Consequently, systems and schemes can vary from region to region. In Sweden, 139 USD of CO_2e taxation will be no comparison to less than 1 USD of CO_2e tax in Poland, Mexico, or Ukraine. Even with the less than 1 USD per ton of bunker fuel donation system, which is almost one-third of CO_2e case revenues are estimated at 5 billion USD, aiming to enhance R&D towards low and zero-carbon fuel and promote the development of commercially viable zero-carbon emission by the early 2030s (IMO, 2020). On top of everything, the existing system will benefit the EU thanks to the current administrative body. But a new administrative body means new bureaucrats, new personnel, and wages, eventually derailing the revenue generated to subsidize the effects of emissions.

An issue of flexibility arises in this discussion with the case of setting the bar too high. Any ETS variations imaginable will come with the need for conversations of allowance levels, whereas in a bunker levy situation level of levy can be changeable in a more timely manner.

Feasibility Evaluation - Full Certainty of reduction in emissions and Success Factor of the Scheme

Miola et al. (2011) and Wang et al. (2015), mentioned in their studies that schemes applied to countries could be examples of the success ratio. Psaraftis (2012), mentions selling points of ETS as full certainty on the emission reductions achieved by the mechanism. The cap on the emission at the end will be a cap that is supposed to be met. A ship that ran out of allowances cannot emit more GHG into the atmosphere without buying new ones from the market. Even with the few fraud cases reported within the EU ETS system, it is not enough to deny the successful ongoing scheme that the EU established.

Literature explicitly states that compared with METS (Maritime ETS), a levy will not be affected heavily by fluctuations since it serves GHG emissions in the long term. It can be easily implemented with the existing structure. However, they see a potential decrease in

maritime traffic, and as a result, GHG emissions will also decrease. On the other hand, METS will hold a better position for protecting the system against corruption. Also, it will be directed to goal with emission cap, and each year the cap will get tighter. In short, METS directly targets the emission decrease, and therefore, it's a practical arrangement. Adapting such a system to a volatile one with a new administrative body and expensive start-up costs at the first stage would be more difficult (Halim et al., 2019; Christodoulou et al., 2021).

Environmental and Social Evaluation - Carbon Leakage and Voyage Evasion

Christodoulou et al. (2021), states fuel expenses can be almost one-third of the total voyage cost; thus, the first thing that comes to mind is alternative modes of transportation to carry goods when the levy exceeds the expected or desired levels. On the global level, modal shifts studies (Avetisyan, 2018; ITF/ OECD, 2018; Halim et al., 2019) focused on the effects of higher maritime transport costs due to a carbon tax. Halim et al. (2019), explain this with doubling transport cost and 25-65% speed reduction by 2030. If implied solely on China-Europe trade, it will result in a 1.37% modal share loss of maritime transport annually 8.7 Metric tons (Mton) of freight volume. The majority will move to rail transport with 7.8%. Globally maritime transport shares will decrease to 0.16%, 34 Mton; however, this will be on the road (13 Mton) and rail (18 MTon). ITF/ OECD (2018), draws attention to modal shifts or leakage, along with cost increase by 20-85% due to IMO 2020 sulfur cap procedures and improvements in Trans-Eurasian railways. Whereas Avetisyan (2018), points out that a global carbon tax of 27.3 USD/ton CO_2 applied on all transport modes will shift to maritime transport. Goods such as micro-chips, seeds from air transport, paddy rice, and wheat and cereal grains from road transport will be carried with ships. Therefore, the implementation of global METS can open a new discussion of global ETS.

Another threat to the ETS system is the evasion of carriers to transport goods to Small Island Developing States (SIDS) to avoid emissions. Eventually, a scheme can make some long-distance voyages from developing countries to developed countries harder due to allowances (Psaraftis, 2012).

Harmony Evaluation - EU's Monitoring-Reporting and Verification and IMO's Data Collection System

Maritime transportation has a different business structure than thermal energy plants as time charters, and bareboat charters are occasional as well as changing flags (Psaraftis, 2012). Regulations are mainly unique to adapt to its nature. EU's Monitoring Reporting and Verification (MRV) and IMO's Data Collection System (DCS) are mandatory to collect emission data from the ships that are 5,000 gross tonnage and above. The MRV became the first watching eye of a supra-national organization and theoretically pushed the IMO to develop DCS after one year. The problem with implementing an MBM will be two systems to monitor emissions in different ways. For instance, reporting focus of DCS is to calculate the emissions on distance traveled, whereas MRV adds to time spent at sea, too (DNV GL, 2021).

Ships that belong to shipping companies of any flag are expected to call at EU ports obligated to file their reporting schemes which give MRV a global reach. Nowadays, discussions of IMO MRV, which has the essential core system from the EU but is tailored to be international documentation for emission system, are made with a possibility of MBM implementation (Psaraftis, 2019).

Conclusion

Zhao (2011), states that stagnant market conditions for the shipping market will not efficiently produce GHG funds for emission reduction. However, consuming less harmful fuels to nature and ultimately axing the emissions is not the only key focus of maritime transportation at the time being. Two main proposals stand out among the most popular MBMs proposed in the literature to curb the pollution of the shipping industry, namely bunker levy and emission trading scheme. The levy scheme targets the price and plays the catalyst role, while the ETS system targets the quantity of emissions.

The influence of the EU is immeasurable in maritime transportation. Willingly showcasing leadership in combating emissions where other supra-national regulatory bodies are hesitant is applaudable. On the other hand, the EU is a major player in the maritime transportation industry. Since the EU has significant trade volumes and main hub ports, their decision within the continent affects the outside of the continent. Countries that export goods to the EU should comply with rules, such as not burning fuels with high sulphur content or reporting to the MRV system. Generally, those rules are not applied to the global infrastructure of maritime transportation within a day. Eventually, a general cargo ship working in the tramp shipping market can be subjected to those rules in the future. Installment of a scrubber system to reduce sulphur emissions will be necessary for the example ship to get a deal if any leg of the trade is from/to any EU ports. The EU's regulatory decisions reflect world scale and may prosper from the unification of the systems by the IMO. IMO is working in parallel with the EU on the decarbonization of shipping. Although helping and unifying decarbonization methods of the EU on a global scale is a sound approach to the urgency of climate change, not every decision should be addressed as the perfect decision. Some regulatory policies are applicable and more efficient within only the EU, whereas some regulatory policies can be even more unified (EU, 2015; IMO, 2016a; IMO, 2016b).

Replication of successful scheme in EU may not be the most favorable option for the entire world. In addition to that, consequences would not be on the shoulder of developed countries. ETS stands for going for direct

results. The scheme can be marked as successful because of the experience of the EU in this scheme. The expansion of the already existing scheme makes the ETS decision as an MBM viable for the EU. Also, the ETS system is not fraud-proof but more protected than the levy. But administrative burden can double the taxation to give the same effect, which can harm the shipping industry. Since emitted pollution is targeted within EU borders, no carbon leakage and evasion of emissions by not delivering goods to distant areas will be possible in ETS. But implementation of such a system globally by IMO can be harmful to the countries like SIDS that do not have any other choice than maritime transportation. Another essential detail is the monitoring schemes that EU pave the way for the world. Eventually, the coexistence of two systems to monitor and report emissions may create distortions when guiding cap-and-trade scheme, and whichever system IMO will choose.
United Nation's regulatory body on seas-IMO and the EU should be able to carry out different approaches to mitigating emissions. On the contrary, the decision of IMO will likely be on the adaptability of the scheme instead of superiority. Eventually, the EU cannot put more pressure on their operators in this scenario. Either allowances will be a mere amount to deescalate the monetary burden of a levy, or the EU can cancel the ETS decision. Otherwise, the competitiveness of EU operators will be negatively affected. In another scenario, IMO's levy decision can be lower than it should and give the lead to the EU.

In this paper, an evaluation of the decision by the EU and its influence on the IMO is discussed. In the case of a counter-discourse by IMO, EU carriers can be faced with more provisions than their opponents in the transportation business. In such future, if the EU has ambitions to remain competitive in the maritime transportation industry, either IMO should choose the ETS as an MBM or the EU must cancel the inclusion of shipping to the EU ETS. The third option, which is not discussed in this paper can be the system where IMO can apply the regulation of bunker levy to the world except EU since the Union already has an ongoing scheme. The hardship of surveillance, possible objections of countries, disruption to a unified system, and complexity of regulations make the third option not so feasible. Therefore, it is not included in this paper. For future research, the level of reflection of the cost that rises due to an MBM can be studied.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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