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# CUSTOMS VALUATION OF WASTE FOR DEVELOPMENT OF THE CIRCULAR ECONOMY

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**Abstract**
Waste becomes a renewable resource, and its low transaction value raises doubts about the calculation of import duties. Inadequately regulated international trade of waste does not correspond to the circular economy concept. The present research aims to present a theoretical model of customs valuation of waste in the context of the circular economy. In the present research were applied scientific literature analysis, comparison, synthesis, deduction methods, and prepared theoretical model. In the theoretical model of customs valuation of waste, two alternatives for determining the customs value were proposed, taking into account the selected waste management policy of the country.

***Keywords***: *circular economy; customs; fallback method; transaction value; waste valuation; waste export; waste import.*
***JEL Codes***: *H23; Q27; Q53.*

## Introduction

In the context of today's world, waste is not just waste, it becomes a resource that can be regenerated into products with high added value. Waste export is only the last step in the hierarchy of waste management, unfortunately, the international trade of waste is constantly growing. A business importing waste must pay various customs duties, where the customs duties amount depends on the customs value of the waste. The methods of customs valuation of goods were adopted in the General Agreement on Tariffs and Trade (GATT) in 1948 and absorbed into the World Trade Organization (WTO) in 1995. To this day we use the methods of customs valuation regulated by GATT, where the transaction value method is mostly used. There is a lack of scientific discussions on whether these customs valuation methods are appropriate and whether they need to be updated.

Given that waste is material or goods the owner wants to eliminate, it is valued at zero or extremely low value. In practice, the problem is that the customs value of waste based on the transaction method is low, which leads that the customs duties paid are small, and this increases the import quantity of waste into the country. Researchers (Du et al., 2023; Weghmann, 2023) note that contaminated waste often enters countries, the level of waste pollution reduces the possibilities of recycling, and this waste remains in the importer's country's landfill. Too low customs duties for the import of waste can harm the environment and human health if the imported waste is not processed and ends up in landfills. However, researchers (Du et al., 2023; Callao et al., 2021) also note the positive aspects of waste imports that countries use waste recycling and incineration capacities, create

more jobs places, and increase local economic growth.

Deeper scientific discussions on the international trade of waste considering the circular economy concept are still lacking. It is not clear whether, in the context of a circular economy, waste should be recovered to resources in the local economy or exported to other countries. It does not clear how the import of waste into the country should be evaluated in the context of the circular economy. A *scientific problem* is raised – how should the customs value of waste be determined that waste management would be based on the concept of circular economy? *The present research* aims to present a theoretical model of customs valuation of waste in the context of the circular economy. The *object of the research* is the customs valuation of waste in the context of the circular economy.

To achieve the aim, the following *research objectives* were set:

1. To perform a comparative analysis of the methods used for the customs valuation of goods.
2. Discuss the concept of waste and its significance for the circular economy.
3. To prepare a theoretical model of customs valuation of waste in the context of the circular economy.

The results of the present research are important from a scientific and practical point of view, as they will allow discussions on determining waste's value in the context of international trade. It will indicate the direction for further scientific discussions on how to regulate the international trade of waste from one country to another country ensuring the recovery of waste into high-value-added resources according to the principles of the circular economy.

## Research methods

The methods of customs valuation of goods, the relationship between international trade terms (INCOTERMS) and customs value of goods, the concept of waste, and the place of waste export in the context of the circular economy were identified after applying the analysis of scientific literature, its comparison, and synthesis. Using the deduction method provided insights into the impact of the amount of the customs value of goods on the government's revenue and business decisions regarding import volumes. Based on the above suggested a theoretical model of customs valuation of waste in the context of a circular economy based on a selected waste management policy.

## Analysis of methods of customs valuation of goods

Customs valuation of goods is significant for the country's international trade and is related to government revenue collection. Lack of understanding of the determination of customs valuation of goods and the procedures that complement it is identified as the main factor reducing the effectiveness of customs authorities, creating barriers to international trade, and endangering revenue collection (Goorman, Wulf, 2005). The main document defining the requirements for the customs valuation of goods, which many countries follow today, is the GATT, which WTO recognized as a law in 1994 (Juárez Allende, 2022).

The GATT defines how and what methods of customs valuation of goods can be applied in international trade. Methods of customs valuation of goods are applied to determine the customs value of imported goods, which is used as a basis for calculating import duties (Wahyudi & Efendi, 2019). Table 1 explains the methods of customs valuation of goods and their application.

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**Table 1. Methods of customs valuation of goods**

| Methods of customs valuation | Application of the method of customs valuation |
|---|---|
| (1) Transaction Value Method | The customs valuation of goods is based on the actual price of the goods being valued, which is usually presented in the invoice. When there is no transaction value or it is not acceptable because the price has been distorted due to certain conditions, other methods of customs valuation of goods are used. |
| (2) Transaction Value of Identical Goods Method | When the goods are identical in all respects (physical characteristics, quality, reputation), produced in the same country, and by the same manufacturer as the goods being valued (at the same commercial conditions and substantially the same quantity), then the transaction value is calculated in the same way as for identical goods. This method can be used when the goods are exported to the same country and at or around the same time. |
| (3) Transaction Value of Similar Goods Method | When the goods are similar (in terms of ingredients, and features), and can perform the same functions, produced in the same country, then the transaction value is calculated the same as similar goods. This method can be used when the goods are exported to the same country and at or around the same time. |
| (4) Deductive Value Method | An alternative method where the customs valuation of goods cannot be carried out using transaction value methods. The value is determined by the price of the goods at which the imported goods (identical or similar) are sold to an unrelated buyer in the highest aggregate quantity, less profit, certain costs, and expenses incurred after importation. This method can be used when the buyer and seller are not related parties and the goods are exported to the same country and at or around the same time, but not more than 90 days apart. |
| (5) Computed Value Method | Customs valuation of goods is carried out according to the production costs of the goods being valued, plus the sums of profit and general costs. This method is the most complicated and rarely used. |
| (6) Fallback Method | If the customs valuation of the goods cannot be carried out by the methods discussed above, then the customs value of the goods shall be determined using reasonable means following the GATT (Article VII). |

**Source: compiled by authors based on Juárez Allende (2022), Goorman & Wulf (2005).*

The transaction value method (1) presented in Table 1 is the most used in practice, it is applied to more than 90 per cent of the world's trade transactions, which ensures uniformity and transparency for business (Juárez Allende, 2022). The transaction value method cannot be applied if the buyer and seller are related parties or there are restrictions on the disposal of the goods, and this has affected the price of the imported goods or there are other circumstances that have affected the value of the goods (Clarete, 2004). In cases where the first method (1) cannot be applied due to the aforementioned reasons, other methods (4-6) are applied (see Table 1).

The disadvantage of transaction value methods is that invoices may indicate less than the actual transaction price, which affects the calculation of lower taxes due to the possible decrease in government budget revenues (Wahyudi, Efendi, 2019). The transaction value also includes other costs that are not included in the price, so the value indicated in the invoice may be adjusted by the necessary costs that were necessary during the production, export, or import of the goods – commissions, brokerage fees, container costs, packaging costs, transportation costs to /from the port, loading or unloading costs, etc. (Goorman & Wulf, 2005; Clarete, 2004).

The fallback method (6) shown in Table 1 is rarely applied, but if it has been applied, the customs authority must follow a clear process for calculating the customs value of the goods and must disclose it (Goorman & Wulf, 2005).

Need to take into account that INCOTERMS applied for the transaction of goods international trade between the parties to the transaction may be significant for the customs valuation and customs value determination of the goods (Wahyudi & Efendi, 2019). Different countries of the world have different practices regarding the application of the value of goods determined under INCOTERMS as the customs value (Table 2).

**Table 2. INCOTERMS and customs valuation**

| Country | Application of INCOTERMS for customs valuation of goods | Source |
|---|---|---|
| Israel | The customs value of the goods is determined according to the term CIF of INCOTERMS, i.e., transportation and insurance costs are added to the value of the goods. | Wagner (2021) |
| South Korea | According to the Europe Union and South Korea free trade agreement, the customs value of the goods corresponds to the CIF value of the goods determined under INCOTERMS. | Chung & Han (2019) |
| Indonesia | The customs value of the goods is determined according to terms FOB, CFR, or CIF of INCOTERMS, but this value may be adjusted due to additional costs and discounts. | Nugroho (2015) |
| United States of America | The terms FOB and CIF of INCOTERMS are used to facilitate the determination of the customs value of the goods, but not as the final customs value of the goods. | |
| Japan | Term CIF of INCOTERMS is not considered a customs value but is used to facilitate the calculation of the customs value by adding other necessary elements. | |

*Explanations: CIF – cost, insurance, and freight; CFR – cost and freight; FOB - freight on board.*
**Source: compiled by authors.*

As presented in Table 2, under specific terms of INCOTERMS, the value of the goods may correspond to the customs value of the goods or facilitate the valuation of the customs value of the goods.

Although the processes and applicable methods for the customs valuation of goods are clear, practitioners and researchers have various problematic questions regarding the determination of the customs value of goods. According to Wagner (2021), the ongoing COVID-19 crisis has caused problems for supply chains (difficulties in ports, lack of ships and containers), and transportation costs have increased from 10 to 100 per cent, but there is currently no legal solution to exempt importers from extremely high customs duties due to unreasonably increased transportation prices. Taking into account that according to the transaction value method, the price of goods is adjusted by transport costs, the customs value of the goods will be high if the transport costs increase significantly. The higher customs value of goods means higher customs duties.

Considering the object of the present research, the researchers emphasize the price of imported goods, especially in the case of international trade of waste, the price may be low or even zero (Mazzanti & Zobolo, 2013, cited in Kellenberg, 2015). The amount of transportation costs will determine the business decision on whether the waste will be imported to another country (Mazzanti & Zobolo, 2013, cit. Kellenberg, 2015). In the case of the international trade of goods or waste, the price, and transport costs play a key role.

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Summarizing the analyzed literature, the impact of customs valuation of goods on government revenues and business decisions is presented in Fig. 1.

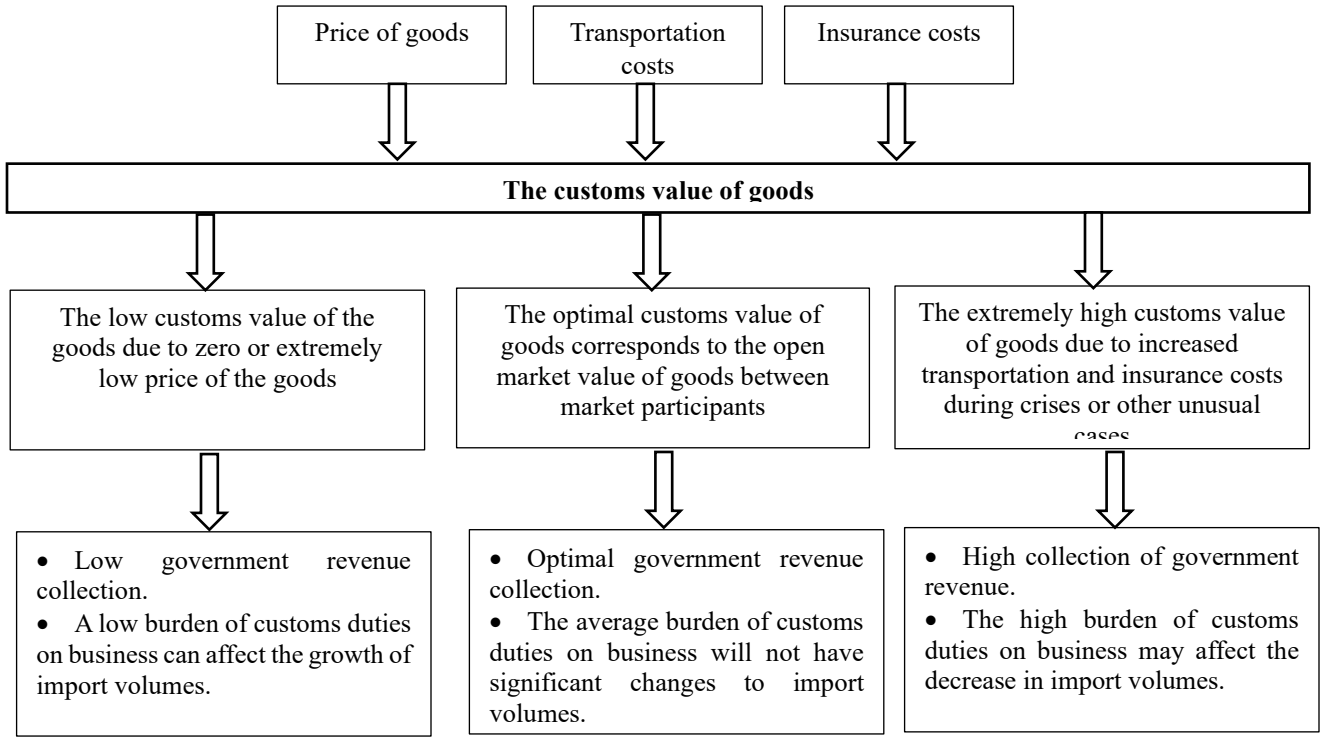


**Fig. 1. The impact of the customs value of goods on government revenues and business decisions**

**Source: compiled by authors.*

As presented in Fig. 1, the customs value of goods depends on the price of the goods, as well as transportation and insurance costs, which determine the amount of the customs value of the goods. Various researchers emphasize the importance of goods price and transportation costs more than insurance costs. Business decisions regarding import volumes will depend on the determined customs value of the goods, as this is the tax base for calculating customs duties. Summarizing the analysed scientific literature, it can be assumed that if the goods are imported at zero or extremely low cost (when the goods are donated or disposed of as waste), the customs duties value will be low and the collected government revenue will be small, and the volume of imports in the country will have the tendency to grow. However, in cases where transportation and insurance costs will increase significantly due to various reasons (pandemic, crisis, war, etc.), the customs duties value will be extremely high, which may cause financial difficulties for business entities due to the high burden of customs duties, since the government revenue will be high. It can be assumed that in such a case, the business will tend to abandon some import transactions and the volume of imports in the country will decrease, in some cases, it may create a shortage of raw materials in the industry or disrupt the supply chains of raw materials.

## The concept of waste in the context of the circular economy

The term waste refers to raw materials, materials, or other products that are unfit for use or are not intended for use and they are getting rid of (removed, disposed of) due to useless or unnecessary at the end of the process (Oxford Dictionary, 2018, cited Bugge et al., 2019). Waste management is an area of concern where the new direction of the circular economy is related to the efficient use of resources through waste reduction, reuse of waste to preserve long-term value, reducing the use of primary resources and closed production cycles, and not exceeding the limits of environmental, economic and social benefits (Širá et al., 2022).

The main problems are related to sub-optimal urban and industrial management processes, where waste is not re-entering into the production cycle, as intermediate processes (cleaning, transformation, recycling) are required, which are usually not available due to the need for additional use of energy and other resources (Peralta et al., 2020). There is no perfect system that allows the reuse of all resources (Širá et al., 2022), so various researchers provide insights on how to address existing problems.

The strategy of the circular economy presents a hierarchy of waste management that prioritizes waste reuse, reprocessing, or recycling (Peralta et al., 2020; Bugge et al., 2019). Zhang et al. (2022) identified 10 different pyramids of waste management hierarchy based on regulations and suggestions of other researchers, taking into account the use of resources, the specifics of the sector, or the pursuit of zero waste. As noted by Zhang et al. (2022) the key factor includes not only the ecological disposal of waste in the waste management hierarchy but also the conservation of resource value. In the pyramid of the waste hierarchy proposed by Gharfalkar et al. (2015), emphasis was placed on preserving the value of resources. This proposed hierarchy of waste management is significant considering the object of the present research – the export of waste. Figure 2 shows the pyramid of waste management hierarchy, where one of the components is the export of waste.

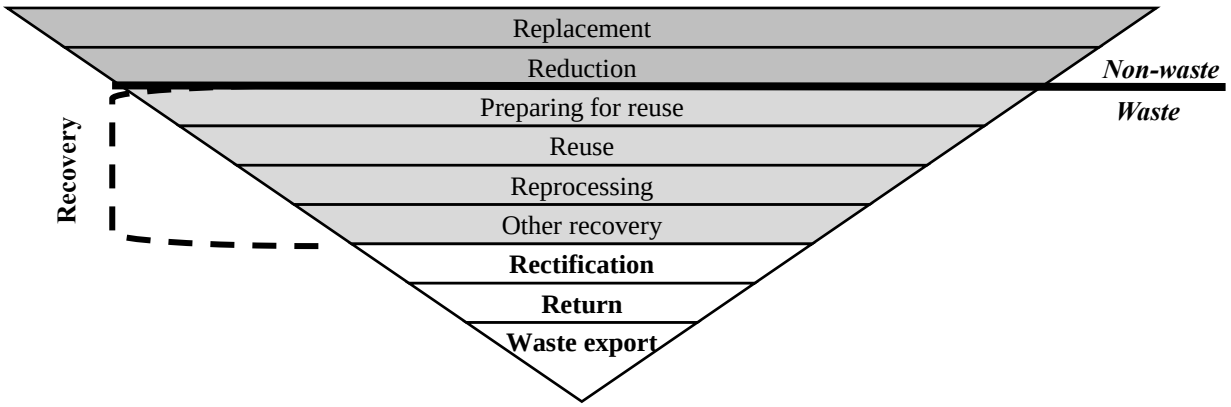


**Fig. 2. Hierarchy of waste management**

**Source: Gharfalkar et al. (2015).*

As can be seen in Fig. 2, the presented pyramid of waste management hierarchy focuses on the tools of waste management and the content of their use (Zhang et al., 2022). Gharfalkar et al. (2015) first distinguish a production process where no waste is generated (replacement and reduction). The replacement phase involves changing existing demand to demand with environmentally friendly materials and replacing non-renewable resources with renewable resources. The reduction phase refers to the reduced use of resources through less

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purchasing of resources and less use of resources in production.

The waste management hierarchy proposed by Gharfalkar et al. (2015) explains if waste is generated, then resource recovery must be carried out (see Fig. 2), which consists of four stages. These stages include preparation for re-use and re-use without additional steps such as repair, renewal, restoration, recycling, or other operation. Reprocessing may also occur when a repeated production cycle is performed or any other recovery of resources. According to Širá et al. (2022) reuse of waste in a sense requires more effort in the transformation of production and consumption, but in the context of a circular economy, it has more benefits – cost savings, new jobs created, innovation, increased productivity, efficient use of resources, better availability of resources, energy savings, reducing landfill filling, reducing greenhouse gas (GHG) emissions.

In the context of the circular economy, priority is given to avoiding waste and trying to preserve resources as long as possible by keeping them in the product cycle, i.e., reuse as much as possible and dispose of as little as possible, and extract raw materials as little as possible (Weghmann, 2023). Therefore, the suggested stages of rectification and return (see Fig. 2) by Gharfalkar et al. (2015) should be applied when resource recovery is not possible. The rectification phase is the treatment of the waste before disposal, while the recovery phase involves landfilling or incineration of useless waste without obtaining energy. By Du et al. (2023), many countries have a flawed practice of treating waste as a non-useful resource, even though in some cases waste has a very high economic and recovered resource value. Therefore, it must be aimed to apply the earlier stages of recovery presented in Figure 2.

The final stage (see Fig. 2) involves the export of waste, where the waste is used as a resource in another country. Gharfalkar et al. (2015) note that exporting waste from developed countries to less developed countries is not a safe waste management practice, as it is only an approach that creates the illusion that there is no waste in the exporting country's landfills. On the contrary, Du et al. (2023) noted that waste exports can promote resource reuse, which provides cheaper raw materials, reduces waste accumulation in landfills, and protects the local natural environment, and in importing countries, waste will create high economic value through recycling into new products, which can contribute to the national economy and production development. This is supported by Kellenberg (2015), who agrees that international trade in waste can have benefits through job creation, economic growth, and more efficient and sustainable use of resources.

Callao et al. (2021) study of hazardous waste shipments in Europe in terms of compliance with environmental legislation for sustainable European development revealed that hazardous waste is shipped to high gross domestic product (GDP) countries. According to Weghmann (2023), the waste management system in the European Union (EU) is highly dependent on exports and imports, due to waste incineration. In the study of Callao et al. (2021), the capacity of waste incineration is associated with high GDP, as countries with high GDP have better waste treatment facilities and more waste incinerators.

However, Du et al. (2023) study in Australia provides the opposite result that some of the imported waste is not recycled and some of it ends up in the importing country's landfills. According to Weghmann (2023), one of the problems is that exported waste is often contaminated, which reduces the possibility of waste recycling. Du et al. (2023) found that the location of exported waste is related to the economic and social development of importing countries, which has a significant impact on energy consumption and the environment. Therefore, in the future, waste-exporting countries must consider environmental factors

before exporting waste. Weghmann (2023) based on previous studies gives an example, due to pollution, and suggests setting the threshold for waste export to 0.5 per cent of the level of waste pollution.

The decision to export or import waste can be conditioned by the added value created by the waste. If the recovery of waste into resources is expensive for the owner of the waste, and the export of waste creates added value, he will tend to export waste. Accordingly, the waste importer, seeing the added value created by the waste, will tend to import it into his country. Therefore, to understand the decisions made in waste management and waste international trade in the context of the circular economy, it is important to assess the added value created by waste (see Table 3).

**Table 3. The recovery of waste into value-added products**

| Type of waste | Added value is created from waste | Source |
|---|---|---|
| Electronic waste | Electronic waste (e-waste) recycling broadly includes the extraction of metals and metal oxides, but the main focus is on the recovery of metals (copper, gold, silver). Often, other materials from e-waste are difficult to extract and have low economic returns, which negatively affects the increase of secondary waste in landfills. Improper management of secondary waste due to toxic substances causes major environmental problems and the loss of many valuable materials. | Gautam et al. (2022) |
| Biomass waste | Applying innovative biomass waste processing methods can create high-added value products and have beneficial effects on biomass waste by processing it into vitamin C, antioxidants, food dyes, fragrances, food additives, preservatives, or other materials needed for paper, textiles, food, medicine, building materials or in biofuel production. | Torres-Valenzuela et al. (2020) |
| Mixed plastic waste | The amount of mixed plastic waste recyclables is low, and traditional methods of disposal (landfill and incineration) cause secondary pollution and deplete a lot of natural resources. Therefore, in the concept of sustainable development, various countries are looking for ways to use mixed plastic waste to create cost-effective and environmentally friendly value-added products, such as gaseous fuel, liquid ammonia, other chemicals, embedding plastic waste in asphalt, building materials, polyester textiles, etc. | Vazquez, Barbosa (2016) |

The previous research analysed in Table 3 reveals examples of the value-added products created from waste. The growth of the electronics industry and the decreasing lifespan of electrical devices have been found to have a negative impact due to the rapid increase in e-waste (Gautam et al., 2022). However, as presented by Gautam et al. (2022) it is necessary to expand the recovery of electrical waste into value-added resources, not only for base metals but also for other valuable materials that are currently being lost.

Food waste is identified as one of the biggest global challenges (Širá et al., 2022), of which agricultural food waste accounts for 5 billion tons of biomass waste per year worldwide (Torres-Valenzuela et al., 2020). As can be seen in Table 3, biomass waste can be processed into various other resources that create high-added value.

Recycling of mixed plastic waste is another challenging area, as the recycling of mixed plastic waste is difficult due to the separation of materials. However, research (Vazquez & Barbosa, 2016) reveals that the reuse or recycling of mixed plastic waste can create products with high added value.

After summarizing the analysed scientific literature, it was found that the concept of waste in the context of the circular economy includes a hierarchy of waste management, according to which decisions are first made on activities that do not generate waste, and in the case of waste generation, the recovery of waste into secondary resources that create added value must be carried out. Various studies have revealed that even

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problematic areas such as food waste, electrical waste, or mixed plastic waste can be used or recycled into high-value resources. And only if the generated waste cannot be recovered, it can be rid of or exported.

**The theoretical model of customs valuation of waste**

As discussed in the previous section, three components are important for determining the customs value of goods: the price of the goods, transportation costs, and insurance costs. Research (Zhao et al., 2021) notes that the trade price of waste is an important factor affecting the import and export trade pattern for plastic waste. It is observed that the value (price) of the waste is usually zero or low, and the transportation costs can be expensive (Mazzanti & Zobolo, 2013, cited in Kellenberg, 2015). A study of United States of America (US) entities (Thompson, 2020) revealed that when prices are lower, more plastic waste is purchased, and when the price is higher, then US entities are less inclined to recycle and import plastic waste. Then there is an increase in the export of plastic waste to China, and in many cases, plastic waste is thrown into landfills or incinerated. It is observed that even if the price of plastic waste in the US is high, the cost of importing plastic waste may be lower for China entities due to differences in supply, demand, and currency exchange rates.

The international trade of waste is influenced by the distance between countries and the taxes for waste disposal, it is stated that if the costs due to the waste disposal tax plus the cost of transportation to a foreign country are lower than in the local market, the entity will choose to export waste to a foreign country (Mazzanti & Zobolo, 2013, cited in Kellenberg, 2015).

Kellenberg (2015) also notes that differences in waste tax and disposal costs between countries can lead to illegal trade in waste, which would harm the environment and human health, but there is a lack of research on the impact of crime on waste trade flows between countries.

Import taxes can be used as a policy tool to reduce imported waste to reduce the negative externalities associated with waste disposal in the country, but the unwanted effect of these taxes affects the cost of waste disposal services and local waste intensity (Copeland 1991, cited in Kellenberg, 2015). After summarizing the analysis of the scientific literature, a theoretical model for choosing the method of waste customs valuation is presented in Fig. 3.

As shown in figure 3 the choice of waste customs valuation method and the amount of collected customs tax revenue are influenced by the country's waste management policy. In the presented theoretical model, two directions of waste management policies are distinguished: (1) to promote the import of waste into the country or (2) to reduce the import of waste into the country. Taking into account that the customs valuation of waste and calculated customs value of waste is the tax base for calculating customs taxes, countries should choose two different methods of customs valuation. The theoretical model suggests choosing the traditional transaction value method or the fallback method to calculate a higher waste value than the actual transaction price of waste.

If the country's waste management policy (2) is aimed at reducing waste imports, customs taxes would be calculated from the higher customs value of waste (using the fallback method), and a higher burden of customs taxes would encourage changing manufacturing in the local market, recovery resources from waste generated in the local market, and export excess waste.

If a country's waste management policy (1) is aimed at increasing the volume of waste imports, customs duties would be calculated on the value of the waste transaction (which is likely to be lower based on transaction value method), which would not have a significant tax

burden on business. A low tax burden would increase the amount of imported waste, as well as create new jobs, the production capacities of the country's waste processing and incineration facilities would be used up, and thus contribute to the country's economic growth.

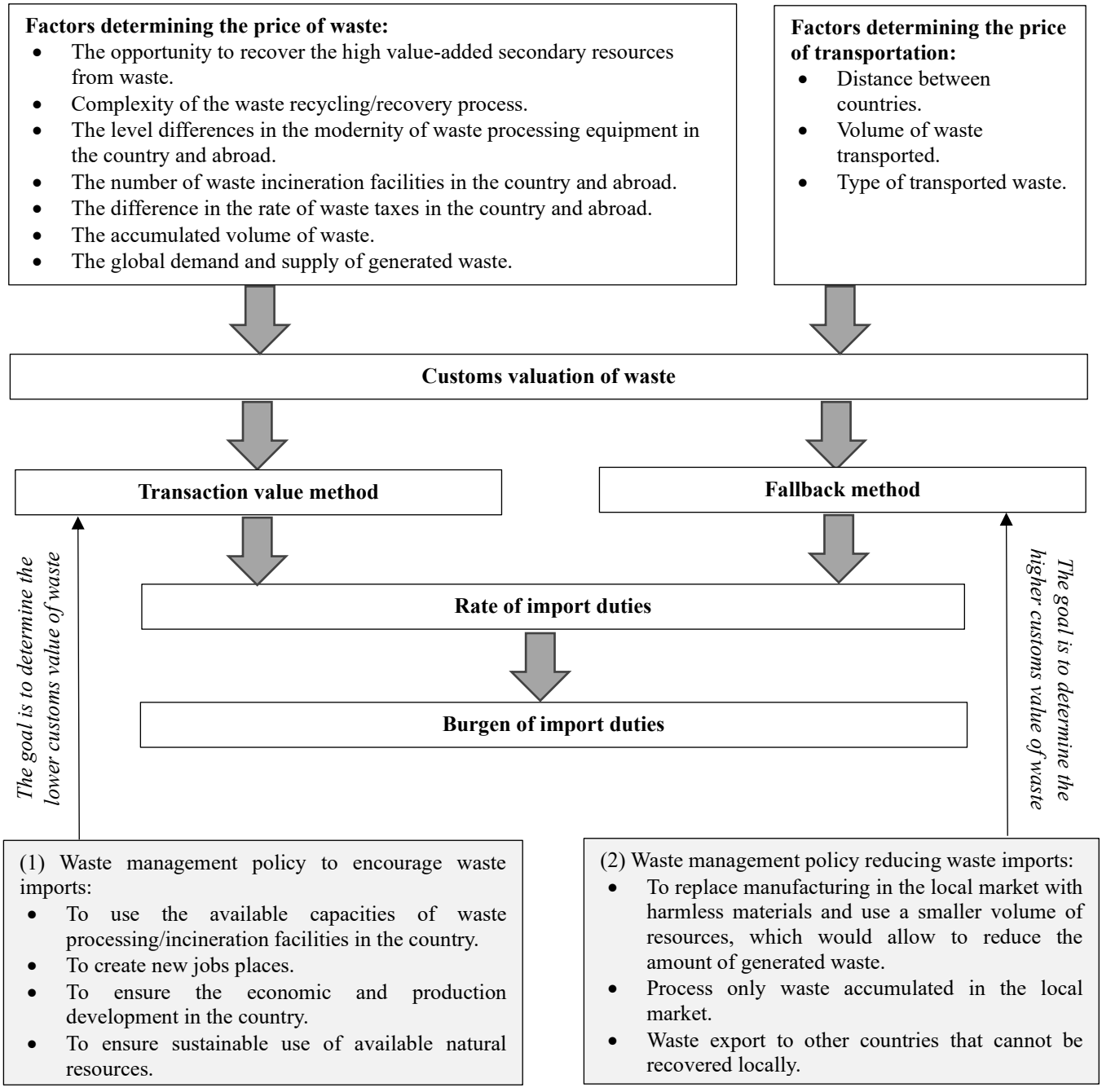


**Fig. 3. A theoretical model for the selection of the waste customs valuation method**
**Source: compiled by authors.*

In the context of a circular economy, both waste management policies presented in Figure 3 can have positive effects. In countries that have chosen to reduce the volume of waste imports, a local circular economy would be ensured when the hierarchy of waste management is followed

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in the local market. In countries that choose to promote waste imports, the circular economy would be ensured in the broader theory of countries. It is useful when countries that do not have the necessary production capacity to recover waste into value-added resources, so the waste is exported to another country that has such production capacity, thus ensuring the concept of a circular economy too.

## Conclusions

The analysis of the scientific literature allowed us to identify six applicable methods of customs valuation of goods. Although the transaction value method is commonly used for the customs valuation of goods, when international trade of waste is taken into account, doubts arise about the suitability of this method. Taxes applied to international trade are one of the policy instruments to regulate the volume of international trade, but in the context of international trade of waste, waste is faced with zero or extremely low value. The determined low customs value of waste means low customs taxes, here we face several dilemmas whether the collection of such taxes in the government budget is sufficient and whether the country needs growing waste imports. In the context of a circular economy, the international trade of waste should be the last step when the recovery of waste into resources is not possible within the country. It is observed that often the import of waste is caused by the non-utilization of the production capacity of waste processing and incineration facilities with local waste.

It can be said that depending on the chosen country's waste management policy, different methods of waste customs assessment could be applied, which would depend on the size of the customs tax burden. In the proposed theoretical model of the choice of waste customs valuation method, the transaction value method is proposed to be applied to countries whose waste management policy is aimed at promoting waste imports. Countries whose waste management policy is based on the recovery of local waste into resources, and which aim to reduce the cases of waste import should choose a backup method that, using reasonable measures, could determine the purpose of the waste corresponding to the value of the waste, the possible added value created by recycling it.

It should be noted that further scientific discussion on this issue is needed. Because the current transaction methods do not reflect the waste's real value after considering that the imported waste will be recovered into a high-value-added resource. Although the fallback method is proposed as an alternative in the theoretical model, the adequacy of the fallback method should be considered in principle. Considering that new methods of customs value have never been proposed by GATT (the legislation has existed for many years), it is necessary to find new methods of customs valuation in the future, based on innovative methodologies, especially for waste valuation in international trade.

### References

Bugge, M. M., Bolwig, S., Hansen, T., & Tanner, A. N. (2019). Theoretical perspectives on innovation for waste valorisation in the bioeconomy. In *From Waste to Value.* Routledge. 51-70 p.

Callao, C., Latorre, M. P., & Martinez-Nunez, M. (2021). Understanding hazardous waste exports for disposal in Europe: A contribution to sustainable development. *Sustainability*. Vol.13. No.16: 8905. https://doi.org/10.3390/su13168905

Chung, J. W., & Han, K. M. (2019). A Study on the Value Added Criterion of Rules of Origin under FTAs with the US and EU: Focusing on Automotive Sector. *Journal of Korea Trade.* Vol. 23. No.6: 1-13. https://doi.org/10.35611/jkt.2019.23.6.1

Clarete, R. L. (2004). Customs valuation reform in the Philippines. World Development Report 2005, 31354. Available online:

https://documents1.worldbank.org/curated/en/340911468776089286/pdf/313540PH0custo11WDR20050bkgd0paper1.pdf (accessed on 20 July 2022).

Du, L., Zuo, J., O'Farrell, K., Chang, R., Zillante, G., & Li, L. (2023). Transnational recycling of Australian export waste: an exploratory study. *Resources, Conservation and Recycling*. Vol. 196. No. 107041: 1-15. https://doi.org/10.1016/j.resconrec.2023.107041

Gautam, P., Behera, C. K., Sinha, I., Gicheva, G., & Singh, K. K. (2022). High added-value materials recovery using electronic scrap-transforming waste to valuable products. *Journal of Cleaner Production*. Vol. 330. No. 129836: 1-19. https://doi.org/10.1016/j.jclepro.2021.129836

Gharfalkar, M., Court, R., Campbell, C., Ali, Z., & Hillier, G. (2015). Analysis of waste hierarchy in the European waste directive 2008/98/EC. *Waste management*. Vol. 39. No. 2015: 305-313. https://doi.org/10.1016/j.wasman.2015.02.007

Goorman, A., & De Wulf, L. (2005). Customs Valuation in Developing Countries and the World Trade Organization Valuation Rules. *Customs Modernization Handbook*. The International Bank for Reconstruction and Development / The World Bank. 155-81 p.

Juárez Allende, H. H. (2022). Valuation of Good. In *The World Customs Organization: Past, Present and Future.* Cham: Springer International Publishing. 133-139 p.

Kellenberg, D. (2015). The economics of the international trade of waste. *Annu. Rev. Resour. Econ.* Vol. 7. No.1: 109-125. https://doi.org/10.1146/annurev-resource-100913-012639

Nugroho, B. (2015). The use of CIF Incoterms in Indonesia's import declarations. *World Customs Journal*. Vol. 91, No.1: 91-101.

Peralta, M. E., Luna, P., & Soltero, V. M. (2020). Towards standards-based of circular economy: knowledge available and sufficient for transition? *International Journal of Sustainable Development & World Ecology*. Vol. 27. No. 4: 369-386. https://doi.org/10.1080/13504509.2019.1701581

Širá, E., Kravčáková Vozárová, I., Kotulič, R., & Dubravská, M. (2022). EU27 countries' sustainable agricultural development toward the 2030 agenda: the circular economy and waste management. *Agronomy.* Vol. 12. No.2270: 1-16. https://doi.org/10.3390/agronomy12102270

Thompson, A. M. (2020). The Impact of Economies on Plastic Waste and Recycling Due to International Trade. Available online: https://trace.tennessee.edu/cgi/viewcontent.cgi?article=3405&context=utk_chanhonoproj (accessed on 20 July 2022).

Torres-Valenzuela, L. S., Ballesteros-Gómez, A., & Rubio, S. (2020). Green solvents for the extraction of high added-value compounds from agri-food waste. *Food Engineering Reviews*. Vol. 12. No. 2020: 83-100. https://doi.org/10.1007/s12393-019-09206-y

Vazquez, Y. V., & Barbosa, S. E. (2016). Recycling of mixed plastic waste from electrical and electronic equipment. Added value by compatibilization. *Waste Management*. Vol. 53. No. 2016: 196-203. https://doi.org/10.1016/j.wasman.2016.04.022

Wagner, O. (2021). Israel: Is COVID-19 expected more than a war? The increase in customs value in Israel, due to the COVID-19 increase in transport prices-the problem, and the solution. Available online: https://mpra.ub.uni-muenchen.de/108808/3/MPRA_paper_108808.pdf (accessed on 20 July 2022).

Wahyudi, I. T., & Efendi, A. (2019). Analysis of Insurance Documents as an Alternative Tool For Testing Transaction Value in Customs Value Determination. *Customs Research and Applications Journal.* Vol. 1. No. 1: 98-110.

Weghmann, V. (2023). Waste management in Europe. Available online: https://gala.gre.ac.uk/id/eprint/41777/7/41777-Weghman-Waste-management-in-Europe.pdf (accessed on 20 July 2022).

Zhang, C., Hu, M., Di Maio, F., Sprecher, B., Yang, X., & Tukker, A. (2022). An overview of the waste hierarchy framework for analyzing the circularity in construction and demolition waste management in Europe. *Science of the Total Environment.* Vol. 803. No. 149892: 1-13. https://doi.org/10.1016/j.scitotenv.2021.149892

Zhao, C., Liu, M., Du, H., & Gong, Y. (2021). The evolutionary trend and impact of global plastic waste trade network. *Sustainability*. Vol. 13. No. 3662: 1-19. https://doi.org/10.3390/su13073662