

Private Institutions in Waste Management Policies Between Markets and Structures of Corporate Governance

MARKUS A. LEHMANN

Max-Planck Institute for Research on Collective Goods
Kurt-Schumacher-Str. 10
D-53113 Bonn
lehmann@mpp-rdg.mpg.de

Abstract

By way of a comparison of the German and the British system for the management of packaging waste, the contribution argues that the choice of the policy tools to implement Extended Producer Responsibility (EPR) has a critical impact on (a) the structure of markets for waste collection and recycling, as well as on (b) the design of the producer responsibility organizations (PRO), that subsequently emerge. Due to important differences in policy design, one PRO, the Duales System AG, essentially controls the German collection and recycling markets. In contrast, British markets are characterized by a higher degree of competition. While market competition is an important instrument to achieve cost-efficiency of the regulation, it is also pointed out that specific features of *DSD*'s governance structure mitigate anticompetitive effects, while other governance features that were often identified as hampering competition have an economic rationale from the viewpoint of the neo-institutional theory of the firm. Hence, it is necessary to carefully analyze the institutional fine-tuning of PROs before deriving an overall negative impact stemming from a formal lack of competition.

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JEL: D62, D78, L22, L44

1. Introduction

In the last decades, the concept of *extended producer responsibility* has gained considerable importance in the waste management policies of OECD countries. According to the OECD, extended producer responsibility (EPR) is a policy approach in which producers accept considerable financial and/or physical responsibility for the treatment or disposal of post-consumer products. Assigning such responsibility could provide incentives to prevent wastes at source, promote environmentally compatible product design and support the achievement of public recycling and materials management objectives (OECD 2001, 9).

In many cases, EPR policies give rise to so-called Producer Responsibility Organizations (PRO). As Glachant explains, “*most PROs are based on a liability principle according to which the individual producers are responsible for fulfilling certain obligations related to waste prevention, recycling or other waste management aspects. The key point is that individual producers can partly or completely escape from their individual liability by participating to a PRO which collectively fulfils the EPR requirements.*” (Glachant 2004, 188)

This contribution argues that the choice of the policy tools to implement EPR has a crucial impact on (a) the structure of markets for waste collection and recycling, as well as on (b) the design of the PROs, that subsequently emerge. It makes this point by way of comparing the German and British Regulations for Packaging Waste Management, and the private institutions that came into being further to these regulations.

More specifically, the contribution highlights the crucial role of one specific liability tool that has gained prominence in waste management policies, namely, individual take-back obligations. In contrast to the British regulation, such an individual take-back obligation form the underlying principle of the German packaging waste regulation introduced in the late 1980s. Upon political resistance by the affected firms against this very costly regulation, the German regulation allows firms to pool their individual take-back obligations in a dual system of packaging waste collection and recycling, the so-called *Duales System Deutschland (DSD)*. Up to today, *DSD* is the only firm authorized to engage in organizing such a dual system of packaging waste collection and recycling.

The contribution argues that the absence, in the British system, of a far-reaching take-back obligation, together with the absence of a blanket-coverage requirement for waste recovery, played an important role in generating a more competitive market structure. As competition on the collection and recycling markets is an important mechanism to attain the policy objectives of the regulation in a cost-efficient way, this result may, from an economic viewpoint, seem to suggest the superiority of the British system. Indeed, the German arrangement has come under criticism from an antitrust viewpoint since its very inception.

However, the story does not end there. The antitrust concerns that were raised with regard to the German system can be reconsidered by using analytical tools of the economic theory of the firm. The contribution shows that specific features of *DSD*'s governance structure contribute to mitigate anticompetitive effects. Moreover, it also

argues that allegedly anti-competitive features of the German system's governance structure contribute to mitigate specific economic problems that arise under the peculiarities of the German system. It thus reconfirms the classical insight of new institutional economics, that features which have been traditionally interpreted as being anti-competitive may actually have economic merits.¹

The contribution does not argue that structures of corporate governance are a *perfect substitute* for market competition. However, it argues that a detailed analysis of the institutional fine-tuning of producer responsibility organizations and their governance structures is necessary to comprehensively gauge the *overall* economic impact of a formal lack of market competition.

In order to avoid any misunderstandings, a clarification may be useful on what this contribution does *not* want to achieve. It *neither* addresses the economic merits of giving packaging waste the prominent treatment by national and European regulators that could be observed in the last 15 years. *Nor* does it discuss the economic wisdom of setting policy targets pertaining to packaging waste in the specific way this was done by regulators, in the form of material-specific recovery and recycling quotas.² Instead, it asks whether these policy targets are met in a cost-efficient way, and focuses on market competition as a very important mechanism to achieve cost-efficiency.

The contribution proceeds as follows. Section two presents the relevant legislation and briefly summarizes the institutional structure of the German and the British system. Section three compares the systems with regard to their degree of market competition. Section four addresses in more detail the governance structure of the German system. Section five concludes.

2. Legislation and Institutional Structure

2.1 The European Union's Packaging Waste Directive (94/62/EC)

Both the British and the German regulation operate under the umbrella of, and are required to be consistent with, the European Union's Packaging Waste Directive. The directive sets aggregate policy targets in the form of material-specific recovery and recycling quotas. In its first version, the directive required each member state to recover, by 2001, a minimum of 50% and a maximum of 65% by weight of packaging waste. A minimum 15% recycling for each packaging material (glass, paper/board, metals, plastic, and wood) was to be achieved by 2001.

A revised Directive was adopted in January 2004. It will need to be transposed into national legislation by autumn 2005. The Directive requires a minimum overall recycling rate of 55% and a minimum recovery rate of 60% by December 2008 (2011 for Greece,

¹ See Williamson (1979) or, e.g., Ménard's recent studies on private standard-setting institutions (Ménard 1996, 1998).

² It is indeed a standard criticism of environmental economists that the material-specific recycling quotas stipulated as policy targets do most probably not reflect the shadow prices of packaging use and disposal, and are therefore very likely to be welfare-inefficient.

Ireland and Portugal). Material-specific recycling target range from 15 % (for wood) and 22,5 % (for plastics) to 50 % (for metals) and 60 % (for glass and paper/board).

It is important to note that the Directive gives member States considerable leeway in how to meet these quantitative requirements. In particular, the Directive does not require member States to use take-back obligations for the implementation of these targets. In contrast.³ Take-back obligations were part of the first drafts of the directive, discussed in the early 1990's, but were dropped later.⁴

2.2 The German System

The policy targets of the German packaging waste regulation are consistent with, but go beyond the rates set out in the Directive. Since its amendment in 1998, the Packaging Waste Ordinance foresees material-specific recycling quota (by weight) of 60% (for aluminum, composites, plastics), 70% (for paper, steels) or 75% (for glass).⁵

The Ordinance contains a strict take-back obligation, by prescribing each firm to take back the packaging it brought into circulation and ensure its recycling such that these quota are met on the firm-specific level. Specifically, sellers are required to take back the packaging of products that they offer for sale. In the next step, producers are required to take back the packaging used for their products that has already been collected by the sellers, and organize the recycling or disposal of this material.

It is important to note that this obligation links the individual firm to its “own” packaging waste: it has to take back packaging of similar “*kind, shape, and size*” than the one it initially used to sell its products.⁶ This implies that, for instance, a producer of dairy products that uses plastic packaging *cannot* discharge its recycling obligations by collecting and recycling plastic packaging used for cosmetics.

When the first drafts of the Packaging Waste Ordinance became known, in the late 1980s, this far-reaching firm-specific take-back obligation was intensely opposed by affected industries because of its high costs. Since most retailers offer a product spectrum from a multitude of producers, the take-back requirement would have led to high collection and sorting costs, especially at the retail level. Hence, the planned regulation was intensely opposed especially by the large trading companies and by producers who feared that these high handling costs would ultimately be passed on to their sales contracts. In the regulation that was ultimately passed, the authorities agreed not to apply this compulsory requirement to firms which pool their individual take-back obligations by participating in a private collection system of packaging waste collection and recycling, which attains blanket coverage (“*flächendeckend*”) and is easy for individual consumers to use (“*verbrauchernah*”).⁷

³ See Strobl/Langford (2003).

⁴ See Haverland (1999, 197) for a detailed account.

⁵ See Annex I, 1 (2) *Verpackungsverordnung*, the German Packaging Waste Ordinance. When the ordinance was introduced in 1991, these recycling quota were substantially lower. The initial ordinance also stipulated recovery quota, which were abolished by the 1998 amendment.

⁶ See § 6 (1) and (2) *Verpackungsverordnung*.

⁷ See § 6 (3) *Verpackungsverordnung*.

Such a system was founded in 1990 by a coalition of 95 firms from the packaging and filling industries as well as packaging producers and trading companies. The system started operations in 1992; it is operated by the *Duales System Deutschland AG (DSD AG, or DSD for short)*, a private shareholder company. It pools the individual take-back obligations of the participating firms and provides for a financing mechanism. Participating firms of the packaging and filling industries (approximately 19,000) are required to pay a license fee for a label, the so-called “green dot”, which is printed on the packaging used by the firms and signals to consumers that the packaging waste is viable for the dual collection system. The amount paid by a firm depends on its annual packaging use and is calculated according to a price scheme combining material-, weight- and volume-oriented criteria. Revenues from the fees are used to finance collection and recycling activities. *DSD* does not provide these services itself, but has concluded contracts with 414 regionally-operating firms which collect packaging waste, sort it by material⁸ and, typically, deliver it to specialized recycling firms.⁹

Although the underlying legislation does not explicitly place any restrictions on the possible number of such private management systems, the system operated by *DSD* has remained the only one to have received formal recognition by the regulatory authorities. Moreover, its national predominance since its foundation has never been seriously challenged by alternative systems.

2.3 The British System

The United Kingdom did not have packaging waste regulation prior to the EU Directive. To implement the Directive, the United Kingdom issued the *Producer Responsibility Obligations (Packaging Waste) Regulations* (in what follows, see DoE 1997, Haverland 1999, 215-17). Consistent with the first version of the Directive, the British regulator introduced a recovery target of 52% and a recycling target of 16% per material, to be achieved by 2001 onwards.

In contrast to the situation in Germany, the individual British producers do not have to take back their “own” packaging waste. Under the British system, every firm involved in the packaging chain is allocated a specific obligation to recover and recycle packaging waste. The calculation of this contingent is based on the annual packaging weight the firm brought into circulation, and on its so-called percentage activity obligation, which depends on the firm’s position in the packaging chain and is given in table 1. For every material, the material-specific contingents of all firms add up to the aggregate policy target.

⁸ For most materials, used packaging is collected in material-specific bins. Plastics and composites are collected together and sorted afterwards.

⁹ See Flanderka (1999, 118). This picture is somewhat stylized. In reality, there are also specialized companies in which *DSD* is the majority shareholder, which guarantee the recycling of packaging of a specific material.

Raw material manufacturing	6%
Converting	11%
Packing/filling	36%
Selling and wholesaling	47%
Total	100%

Table 1: Firm's Percentage Activity Obligations in the British system

By way of an example, assume that a packer/filler used, in 2001, 172 tonnes of plastic and 334 tonnes of paper/fibreboard. The total packaging weight is 506 tonnes. Hence, his recovery obligation amounts to

$$506 \text{ t} \times 0.52 \times 0.36 = 94.72 \text{ tonnes.}$$

His recycling obligations are given by

$$172 \text{ t} \times 0.16 \times 0.36 = 9.9 \text{ tonnes of plastics,}$$

$$334 \text{ t} \times 0.16 \times 0.36 = 19.24 \text{ tonnes of paper.}$$

The individual firm has different options on how to discharge its responsibility:¹⁰

- First, it can collect packaging waste itself and conclude individual contracts with recyclers. Note that, in contrast to the German regulation, the firm has only to ensure the recovery and recycling of *any* packaging of a specific material, up to the given amounts, *irrespective of whether it brought this specific packaging into circulation or not*.
- Second, the firm can participate in so-called compliance schemes, which organize collection and recycling.
- Moreover, proof of discharged responsibilities for a specific year is furnished by a written confirmation issued by recyclers, a so-called packaging recovery note (PRN). These packaging recovery notes are tradable on an electronic trading market, the Environment Exchange.¹¹ Hence, as a third possibility, firms can also simply purchase these recovery notes in order to discharge their responsibility, and can thus optimize their own collection and recycling efforts at the margin.

3. Market Competition

The highly-centralized German institutional structure was criticized from the outset because of its anti-competitive impact on the markets for waste-recovery and subsequent allocative distortions. Recall that the system operated by *DSD* has remained the only one to have received formal recognition by the regulatory authorities. According to the German antitrust authority, *DSD* controls a market share of 95 % of the entire market for waste-recovery services (Bundeskartellamt 2002). Also, *DSD* has a monopsony with respect to the sorting of plastics and composite packaging waste.

¹⁰ See Strobl/Langford (2003), for a detailed description.

¹¹ See European Packaging and Waste Law 1999, 39.

A number of specific features of the German regulation can be held responsible for the emergence of a single system, and the subsequent lack of market competition:

First, the *blanket coverage requirement*, to be met by each system operator, was frequently identified as severely hampering competition. The standard legal interpretation of this requirement is that each dual system needs to cover at least the area of one federal State, a substantial area in most cases. Hence, this requirement artificially inflates collecting costs and thus creates a major entry barrier for potential competitors.

Second, the strict individual *take-back obligation* itself creates strong incentives to implement a single system. Recall that the take-back obligation links firms to their “own” packaging. This feature generates pressure for a centralized solution, as will be explained now.

Consider first the scenario of having several pooling systems covering the same geographical area.¹² Each system operator would be responsible for meeting the (collective) take-back obligations of its participating firms and for financing the recycling of the collected packaging waste according to the recycling quota. However, each system operator would face the problem of receiving packaging waste from consumers that was not used by the firms that participate in his/her system. The labelling of packaging, to indicate to consumers the collection system responsible for each item, might appear to be a solution to this problem. However, its viability is restricted because it would require consumers to sort packaging not only by material, but also by system operator. This problem would be avoided under a more centralized solution.

Another scenario would depict the existence of multiple regional system operators and benchmark competition. However, under the auspices of the take-back obligation, firms of the packaging and filling industry which cover inter-regional markets would then have to enter into contractual relations with several regional system operators. Those who cover the national market would even have to contract with all operators. In consequence, individual firms would have to reveal to *each* operator the packaging quantities and materials they delivered to the region covered by the specific system. In addition, it would be necessary to establish a clearing mechanism for inter-regional, trans-boundary packaging flows. Alternatively, each operator would have to assign collected packaging waste to single producers, in order to determine their respective financial obligations. Both solutions would imply high accounting and monitoring costs that could be avoided under a more centralized solution.

The German monopsony contrasts with the British situation. According to the British Department for Environment, Food and Rural Affairs, there were, as of 21 May 2004, over 20 compliance schemes registered with the implementing agencies.¹³ Moreover, approximately 10 % of all firms that are required to comply with the regulations chose to take an individual course (as of 21 May 2004, 687 out of a total of 6161 registered firms). Even the British market structure may not reflect perfect competition – the largest compliance scheme, VALPAK, covers almost 50 % of all registered firms (2878 out of

¹² See Ewers et al. (2001), 62-63, for the following arguments.

¹³ See http://www.defra.gov.uk/environment/waste/topics/packaging/pdf/registrations_agencies.pdf for the following data.

6161).¹⁴ However, it is certainly safe to say that the British data reflect a considerable higher degree of competition among PRO in the United Kingdom.

It is also noteworthy that the British compliance schemes are characterized by a diversity of institutional arrangements. While some schemes came into being by a collaborative effort of the affected industries,¹⁵ others are essentially private, for-profit firms (see Packaging Waste Guidelines 1999). While some schemes focus on specific materials and/or regions, others seek to cover the entire range of materials and/or the entire territory.

It is argued here that the absence of the restrictive requirements so prominent in the German system (blanket coverage requirement, strict take-back obligations) is an important reason for the more competitive structure of British collection and recycling markets. The fact that individual firms are not tied to their “own” packaging waste creates substantially higher flexibility in fulfilling the obligations under the regulation. For instance, many firms are enabled to discharge their obligations by collecting the packaging of their suppliers (insofar as of the same material) in their own backyard. Moreover, an individual compliance scheme can recycle packaging irrespective of whether it was brought into circulation by the firms that participate in the system, as long as it meets the material-specific obligations of the participants.

To ensure the cost-efficient implementation of regulation, market competition is certainly a driver whose importance cannot be gainsaid. From this perspective, the analysis presented so far suggests that the British regulatory solution is superior to the German system.

However, such a conclusion may be premature. Obviously, the British system may have deficiencies that were not included in the analysis so far. This is an important objection, made by a number of authors. Consider the following two examples.

- First, incentives for environmentally friendly product innovation may be somewhat lower under a system that does *not* tie the individual firm to its own packaging waste (see Glachant (2004) for this line of argument).
- Second, markets for packaging recovery notes (PRN) may be imperfect (see Strobl/Langford (2003)). These markets are key for ensuring the cost-efficiency of the British system, for the following reason. It is highly probable that the individual obligations assigned in the British system do not reflect the (marginal) collection and recycling costs of the individual firm. Hence, such firm-specific quotas are, as such, very likely to be inefficient. It is the tradability of the recovery notes that may restore cost-efficiency, as it enables the individual firm to choose its efficient mix of collection/recycling activities and the buying/selling of PRN. But cost-efficiency will be restored *only if* the PRN markets function (reasonably) well.

The remainder of this contribution will not follow this road, but seeks to make a complementary argument. It focuses on the concerns made from an antitrust viewpoint

¹⁴ See Strobl/Langford (2003) for an analysis of market imperfections in the British system.

¹⁵ For instance, DIFPACK is owned by the Dairy Industry Federation, and PAPERPAK is owned by the Paper Industry Materials Organisation (see Packaging Waste Guidelines 1999).

with regard to the German system and explores whether and to what extent the specific governance structure chosen for the DSD mitigates the negative impacts stemming from a formal lack of competition.

4. Governance Structure of the DSD

As explained, the German system was criticized from the outset because of its alleged anti-competitive impact on the markets for waste-recovery. Concerns were especially raised

- with respect to *DSD*'s position towards downstream firms in the packaging and filling industries. Would *DSD* not serve as a cartel of the firms owning it, by discriminating against non-owners who, given the cost advantages of a pooling system, must nevertheless rely on *DSD*'s services?¹⁶
- with respect to *DSD*'s position towards upstream firms supplying collection, sorting and recycling services. Here, specific institutional arrangements between *DSD* and waste-recovery firms, detailed below, were identified as being anti-competitive. The suspicion is that waste-recovery firms may use *DSD* to limit competition between each other and to reap rents from downstream firms (and, ultimately, from consumers), and/or from excluded rivals.¹⁷

From a viewpoint of achieving cost-efficiency, these concerns translate into the question as to what extent the *DSD*'s objectives are different from minimizing the costs of complying with the overall policy targets. The following sections will explore this question by analyzing in greater detail *DSD*'s ownership and governance structure with regard to the downstream packaging and filling industries, trading companies and packaging-producers (Section 4.1), and with regard to upstream firms in the collection and recycling branches (Section 4.2).¹⁸

4.1 *DSD* and Downstream Firms

As described above, *DSD* was founded as a joint enterprise by 95 firms in the packaging and filling industries, several trading companies and packaging-producers. Today, *DSD* is collectively owned by some 563 firms of these industries (*DSD* 2002).

It is noteworthy that, while formally organized like a shareholder company, *DSD* actually bears strong similarities to a consumer cooperative.

- First, upon agreement of the majority at the shareholder meeting, firms coming from the industry groups mentioned above can become co-owners of *DSD* at any time. *DSD* continues to remain open for new co-owners.
- Second, shares held by a single firm are restricted by statute to an amount of 2,560 Euro. Shares are issued to the specific owner and, by statute, cannot be transferred

¹⁶ Selmayr 1998, 100; Thomé-Kozmiensky 1994, 106ff.; Sagia 1996, 423, 426, 429f, 437f.

¹⁷ Benzler et al. 1995, 59, 61-2; Hecht/Werbeck 1995, 72; Selmayr 1998, 101; Michaelis 1998, 214, 216.

¹⁸ These sections draw from Lehmann (2004). Please refer to this publication for a more extensive analysis.

without the prior consent of the shareholders' meeting (*vinkulierte Namensaktien*). They are not traded on the stock market.

- Third, by statute, *DSD* does not pay dividends. The same pricing scheme for the “green dot” applies to owners and non-owners. Also, owners do not enjoy any other economic privileges.

These features contribute to prevent the formal discrimination between customers that are co-owners and customers that are not. As *DSD* cannot pay dividends, any surplus must either be passed on by decreasing fees for the “green dot”, or must remain within the firm as a reserve.¹⁹ Retained profits cannot be liquidated via a higher stock value, because shares are not traded and new shares can always be acquired for their nominal value. In consequence, the formal discrimination of customers between owners and non-owners is not possible. While informal discriminatory practices cannot be ruled out, the economic advantage of such practices will be restricted, because any firm is entitled to become an owner for a relatively small amount and thus claim equal treatment.

Furthermore, the features enumerated above also contribute to the efficiency of the pricing schedule. It restricts the possibility a special-interest fraction of owners to influence *DSD*'s pricing policy and implement inefficient cross-subsidization. In principle, producers of high-cost packaging and those users who, for technical reasons, cannot substitute packaging types, could try to usurp *DSD* and implement the cross-subsidization of high-cost packaging via *DSD*'s scheme for the “green dot” license fee. However, given the large number of owner-firms, it is improbable that a group of firms using or producing high-cost packaging can outvote the other owner-firms in the shareholder assembly. As stock transfers are restricted and subject to the prior consent of the shareholders' majority, the takeover by such a group is also improbable.

The history of the pricing scheme since *DSD*'s foundation gives empirical support. The first scheme from 1992 did not differentiate between materials, but relied exclusively on weight and volume, thus subsidizing (light) plastic packaging. Upon intense discussion within *DSD*, the price scheme was modified in 1993 to differentiate between packaging materials. In general, the history of the *DSD* pricing scheme for the “green dot” is one of increased differentiation and material-specific price corrections, where high-cost materials (especially plastics) have been subject to several price increases (see also Michaelis 1998, 213).

These features of the governance structure are not argued to be a *perfect* means to mitigate the problems resulting from a formal lack of competition.²⁰ For instance, *DSD*'s owners may face the typical management control problem of companies whose shares are held by many small owners. Given that management control presumes costly information and monitoring activities, free-riding on monitoring effort may become rampant under dispersed ownership. Hence, the pressure for cost-minimization may be suboptimal under

¹⁹ Any surplus could also (partly) dissipate within the firm as a result of poor managerial performance. This point is further elaborated on in Lehmann (2004).

²⁰ For instance, the implementation of several dual systems specialized on a specific material would be possible even under the restrictions imposed by the German regulation. Such a structure would probably prevent material-related cross-subsidization more effectively.

dispersed ownership, the more so when, like in *DSD*'s case, competition and, subsequently, the disciplining effect of takeover threats, is absent from the outset.

4.2 *DSD* and Upstream Firms

Two important features of the relationship between *DSD* and the waste-recovery firms were usually identified as hampering competition.

- First, waste-recovery firms were usually awarded long-term contracts, without having to regularly bid for new ones. Hence, competition between existing firms was said to be curbed, and the entry of more efficient firms, by inflicting waiting costs, may also be prevented.²¹
- Second, the waste-recovery industry has some degree of direct influence on *DSD*'s management. In 1993, shortly after its creation, *DSD* ran into a deep liquidity crisis, primarily provoked by a miscalculation of the then-valid pricing schedule, by consumers' participation that was much higher than expected, and by lax payment morale on the part of *DSD*'s customers. As a reaction, the overdue bills of the waste-recovery firms were converted into long-term debt, and three seats on *DSD*'s supervisory board (out of twelve) were reserved for representatives of this industry. While no formal co-ownership exists, representation of the industry on *DSD*'s supervisory board was suspected to have anti-competitive effects.²²

These points gave rise to the suspicion that *DSD* might actually be captured by the waste-recovery industry, which might use its influence to charge excessive prices (Hecht/Werbeck 1995, 72; Michaelis 1998, 214) and, hence, generate monopoly-like welfare losses.

However, as indicated earlier, *DSD* has a strong market position in large segments of the waste-recovery markets, and comes close to a monopsony in some segments. This is especially true in those segments in which recycling markets were almost non-existent prior to the German packaging waste regulation (plastics and composite materials). For other materials, recycling markets do not exclusively rely on packaging recycling; *DSD*'s market position may be less dominant here. But even for those materials, the introduction of the dual system led to a huge increase in the recycling volume; hence, *DSD* is still an important customer with respect to the requisite collecting and recycling activities.

Therefore, one should rather expect that *DSD* exercises market power over firms operating in these market segments (remember that *DSD* maintains contractual relations with 414 waste-recovery firms operating at the regional level). In this sense, one may wonder whether the institutional features described above are not a means to mitigate the negative impacts of *DSD*'s market power.

This point can be spelled out in more detail with respect to an allocative distortion that is potentially very important in the case of *DSD*. Technically, investments in recycling capacity will primarily depend on the material to be recycled, and not so much on the

²¹ Benzler et al. 1995, 59; Selmayr 1998, 101; Michaelis 1998, 216.

²² Benzler et al. 1995, 61-2; Hecht/Werbeck 1995, 72; Michaelis 1998, 214, 216.

specific firm which demands recycling services for this material. A similar observation holds for investments in collection and sorting capacities. Hence, as long as several suppliers of packaging waste exist, these investments will be *market-specific* and will not depend on the *relationship* between a specific waste-recovery firm and a specific waste supplier.

Note that there are no technical reasons that waste-recovery services should only be demanded by one firm. This can be seen from the fact that substantial recycling markets already existed for some materials prior to the packaging regulation, hence, prior to the creation of *DSD*. The reason that one firm demands these services almost exclusively lies elsewhere, namely, as was explained above, in the regulatory peculiarities that led to the creation of a single system in Germany.

However, the generation of a single dual system had a crucial consequence: it *politically* transformed investments into recycling and recovery capacity that are, in principle, market-specific, into *relationship-specific* investments. But it is well known from the neo-institutional theory of the firm that a contractual relationship in which relationship-specific assets are built up will result in opportunistic behavior *ex post*, which will prevent efficient investment decisions *ex ante* (Klein et al 1978, Williamson 1979). In the present case, opportunistic behavior *ex post* would have meant that *DSD* could hold up waste-recovery firms after they had made investments specific to their relationship with *DSD*, and force renegotiations in which the gains from trade are divided more in favor of *DSD*. This threat, in turn, would lead to suboptimal investments in recycling and recovery capacities. Upon its foundation, it was, however, especially important for *DSD* to generate appropriate investment incentives:

- First, the Packaging Waste Ordinance had tight deadlines for meeting its recycling quota (Benzler et al. 1995, 59).
- Second, recovery capacities for some materials (especially plastics) had to be built up virtually from scratch.

Hence, the allegedly anti-competitive features presented above can readily be interpreted as attempts to mitigate this politically-generated hold-up problem and subsequent under-investment.

- First, the periodical re-auctioning of contracts may actually impede efficient investment behavior by the incumbent firm when investments are relationship-specific. Long-term contracts, as concluded in the present case, avoid re-auctioning.²³
- Second, given the potential for hold-up because of relationship-specific investments, the fact that the waste-recovery industry is represented on *DSD*'s management and supervisory boards may also improve the industry's bargaining position in regard to renegotiation of the general agreement. Their minority position will not enable the representatives to directly influence the bargaining

²³ See Williamson (1976), 79-90. See also Lehmann (2004) for a more complete analysis of this point, addressing in particular the problem of incomplete contracts, renegotiations, and entry deterrence.

strategy of *DSD*'s management. They will, however, learn the intended bargaining strategy and have access to strategic information held by the boards. Industry representation within *DSD*'s internal governance structure will thus improve the bargaining position of the waste-recovery industry, and, hence, its incentives to invest.

The following conclusion can be drawn. Characteristics of the relationship between *DSD* and the waste-recovery firms that were so far *exclusively* interpreted as being anti-competitive have also economic merits in protecting relationship-specific investments. To generate appropriate investment incentives was a problem of special significance in this case, because the introduction of the packaging waste regulation required the build-up of huge collection, sorting and recycling capacities within a short timeframe.

Again, it is *not* argued that these features perform as efficiently as a hypothetical structure in competitive markets. For instance, representation involves the typical delegation problem of controlling the industry's representatives. As these representatives are, typically, managers of specific waste-recovery firms, they may possess incentives to not protect the "collective" interest of the industry they represent, but to collude with *DSD* in exchange for privileged treatment of their own firms. Were this the case, competition between waste-recovery firms would clearly be hampered. However, in the light of the analysis given above, to derive net decreases in welfare from these features by *exclusively* pointing to their potentially anti-competitive effects means jumping to conclusions too quickly.

5. Conclusions

Two general conclusions can be drawn from the analysis. First, the policy tools chosen to implement Extended Producer Responsibility (ERP) Policies have a crucial impact on the degree of competition on the collection and recycling markets. In particular, the peculiarities of the German system, that is, the far-reaching take-back obligation and the blanket-coverage requirement for waste recovery, were argued to be important reasons for the emergence of a single producer responsibility organisation (PRO) in Germany and a subsequent lack of market competition. Second, the same policy tools have a crucial influence on the design of the PROs that are created to fulfill the obligations under the regulation. In the German case, a specific governance structure was implemented that helped to mitigate the negative allocative consequences stemming from a formal lack of competition, and to mitigate a hold-up problem between *DSD* and upstream firms, a problem that was argued to be a special relevance given *DSD*'s particular position as a (politically generated) monopsony.

However, it was also cautioned that corporate control through structures of governance is not a perfect substitution for market competition. The typical delegation problem of how to control supervisors was identified as being a potential limitation to ensure cost-efficiency of the system. Therefore, it was *not* argued that the *DSD* performs as efficiently as the more competitive British solution. However, the apparent superiority of a system that

features a higher degree of market competition appears to be less clear-cut when the governance structures of monopsonistic PROs are duly taken into consideration.

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