The Social Dimension of Deposit Donation Schemes: Recycling Policies in Germany and Sweden

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Many states have adopted a political agenda towards a more sustainable use of resources. One instrument that creates financial incentives for consumers to put more efforts into recycling is a deposit-refund system for certain goods, such as beverage containers. The deposit that customers in Germany and Sweden pay on most cans and bottles was able to increase recycling rates and reduce littering significantly (Cantner et al. 2010). Yet, they also brought along new, unforeseen mechanisms for social redistribution: urban deposit collections, which refer to low-income persons searching streets for abandoned deposited containers, as well as the more institutionalised deposit donations, which refer to mechanisms that allow customers to donate their deposit money instead of collecting it at the cash desk. Based on data from stores that collected these donations in Stockholm, Sweden, and Berlin, Germany, this work tries to assess to what extent these deposit donations can carry redistributive effects from more to less affluent, or from more to less advantaged.

The article starts with the institutional background of deposit-refund systems in both countries. Thereafter, the new opportunity structures – urban collections and donations - will be contrasted. The main part attempts to evaluate the role of deposit donations as a means to social involvement and redistribution. Comparing the donors and beneficiaries of deposit donation schemes to the redistribution that takes place through urban collections and to the general donation behaviour in both populations leads to a positive assessment of bottle deposit donations as an instrument for social redistribution and involvement. They create a strong redistribution from affluent to poor or disadvantaged and on top of that, they seem to be able to reach younger audiences than classic ways to donate.

1. Bottle Deposit Laws in Germany and Sweden

The arrival and soon abundance of plastic packaging and litter in the 1970s stimulated both in Sweden and Germany discussions about how to handle the quickly increasing amount of non-natural waste and its externalities, in particular from beverage containers (Naoko 2011: 2). One of the possible policy solutions is a deposit which means that consumers pay an extra fee for containers for which they are reimbursed upon their return (OECD 2001). If the money is not collected, the deposit turns into a tax (Ashenmiller 2011). This should lead to reduced litter, more recycled resources, reduced personal and animal harm (injuries), material damages (e.g. torn tyres) and aesthetic benefits (tidier public space) (Morris et al. 2005). Multi-use containers (most glass and certain PET bottles) already receive an industry-led deposit as suppliers have an interest in having them returned (Cantner et al. 2010: 116). The legislators in both Sweden and Germany broadened the scope by enforcing a mandatory deposit on single-use containers (cans, most PET and some glass containers) which

neither consumers (opportunity costs and comfort) nor industry (costs in logistics and storage) would actually want to establish by themselves (Moser 2014: 66ff).

Sweden set out first recycling targets in 1982 leading to an industry deposit-refund system for aluminium containers in 1984 (Returpack 2009). After a merger with a similar law for PET containers in 2005, all containers are deposited with the exception of alimentary contents such as milk for hygienic concerns (SFS 2005:220). Whereas before the mandatory deposit-refund system, Sweden recovered only 51% of its PET containers (Returpack 2009), the share grew to 84.9% in 2016 (Returpack 2016).

In 1991, the German *Verpackungsverordnung* (packaging regulation) aimed at overcoming the 'throw-away society' and introduced a target quota of 72% market share of (deposited) multi-use beverage containers. As the multi-use share dropped significantly in the following ten years and a ban on single-use containers seemed incompatible with EU legislation, a nationwide bottle deposit-refund system for single-use containers – with certain exceptions such as milk - was introduced in 2003 and refined in 2006 (BPB 2012). While one-way containers accounted for up to 20% (Deutsche Umwelthilfe 2001) of littering in Germany before the introduction of the deposit-refund system, they have practically disappeared since (Cantner et al. 2010: 78).

2. New Opportunity Structures

2.1 Deposit Collections

In certain situations, the German €0.25 or Swedish 1 SEK deposits might not outweigh the opportunity costs for an individual to carry them to the next store, making people leave them in the streets or garbage bins. This incentivised individuals to search for and collect abandoned or disposed beverage containers, e.g. in garbage bins, that carry a deposit in order to return them to the store and collect the deposit amount, thereby improving the system's recycle rate (Ashenmiller 2011). The main motivations of those who do pursue this activity are

1. Additional income,
2. Meaningful, independent work,
3. A feeling of service for the general public (Moser 2014).

Individuals engage in this activity if their expected income is higher than labour market wage, or if their labour income wage is constraint (limited working hours, benefits, etc.) (Ashenmiller 2011: 60). The comparatively high deposit amounts in both countries make this activity economically of interest beyond homeless or incomeless milieus, although an entire day of deposit collection often yields only a few euros of revenue (Moser 2014: 14). Moreover, individuals derive self-respect through pursuing a meaningful, autonomous and performance-related activity (Ashenmiller 2011: 61f, Moser 2014: 17). In particular, the feeling of contributing to society's wellbeing promises an additional layer of meaningfulness (Gowan 1997: 169).

MAIN BENEFITS OF DEPOSIT COLLECTIONS

Individuals	Society
Income	Higher recycling rates
Self-esteem and respect from a) Autonomy and independence b) Visible success within performance-related work c) Feeling of public service	Less litter serving a) Environment b) Public health c) Aesthetic wellbeing
Participation in public life	

2.2 Deposit Donations

Bottle deposit schemes in Germany and Sweden have also given rise to deposit donation schemes in various forms. Sometimes charitable organisations put a huge container in a much-frequented public space asking people to insert and donate their deposited beverage bottles and cans. When they collaborate with stores directly, customers can either donate into a small "mailbox" the receipt that entitles to collect the deposit amount (Berlin data) or the reverse-vending machine allows to directly choose between donation to charity and collection of the deposit (Stockholm data).

The relationship between the collections (2.1) and donations (2.2) is in practice not competitive. Once at the store, the choice is between donation and redemption. As long as one is not at a supermarket, the choice is between urban collection (disposal of the container) and the effort of reaching the next point that would take back the container and give out a deposit or permit a donation.

3. Redistribution in Deposit Donation Schemes

Under the assumption that a (grocery) supermarket's customer base is roughly conforming to the socio-economic background of its neighbourhood, donation data from two chain-stores in Berlin and two chain-stores in Stockholm have been used to analyse who donates their bottle deposits. The deposit donation levels of different areas will therefore be compared to the area's education level, mean age, mean income and unemployment level as these are demographic factors that generally affect donation levels and indicate the levels of redistribution (for Sweden: Vamstad 2015, for Germany: Lakemann 2012, Ullrich 2016). As only correlations between these factors and the donation levels have been analysed in this work, the findings presented should be regarded as a tentative first approach to the redistributional dynamics of bottled donation schemes.

The data for Berlin encompass the monthly donation collections of 42 supermarkets and 62 discounters in 2015 and 2016, which have been set in relation to the socio-economic data of the respective areas (*Bezirke*). The supermarkets are bigger in size and have a more affluent and environmentally-aware customer base while the

discounters tend to be smaller and have a more price-aware customer base. As only absolute donation data were available, there is a risk to skewing if a store happens to have a disproportionately wider customer base. However, this would incentivize market entry for competitors and would therefore be quickly mitigated. The Stockholm data correlates the relative donation levels of two supermarkets of 58 and 42 stores respectively in 2015 and 2016 with the socio-economic data from the different areas (*stadsdelsområden*).

Correlations between Deposit Donation Levels and Socio-Economic Background

		Income	Unemployment	Mean Age	Tertiary Education
Berlin Supermarket (Average absolute monthly donation 2015 and 2016)	Pearson Correlation *r*	.360**	-.354**	-0.042	.374**
	Significance (two-tailed)	0.001	0.001	0.705	0.001
	N	82	82	82	82
Berlin Discounter (Average absolute monthly donation 2015 and 2016)	Pearson Correlation *r*	,503**	-,390**	,260**	,404**
	Significance (two-tailed)	0.000	0.000	0.05	0.000
	N	113	113	113	113
Stockholm Supermarket A (Average relative monthly donation 2015 and 2016)	Pearson Correlation *r*	0.136	-.204*	0,108	.230*
	Significance (two-tailed)	0.148	0.029	0.252	0.013
	N	115	115	115	115
Stockholm Supermarket B (Relative donation amount 2016)	Pearson Correlation *r*	.632**	-.566**	0.270	.583**
	Significance (two-tailed)	0,000	0,000	0,084	0,000
	N	42	42	42	42

Colour				
Correlation	$0 \leq \lvert r \rvert < 0.1$	$0.1 \leq \lvert r \rvert < 0.3$	$0.3 \leq \lvert r \rvert < 0.5$	$0.5 \leq \lvert r \rvert \leq 1.0$
Description	None	Weak	Moderate	Strong

Berlin: Income: the average monthly household net income 2015 (Amt für Statistik Berlin-Brandenburg, Statistischer Bericht A I 11 – j /15); Unemployment is the official unemployment rate from 15 to 65 years in 2015 (Statistischer Bericht A | 10 – j / 15, A VI 2 j / 15); Mean Age: Mean Age of Population 30/06/2016 (Statistischer Bericht A I 5 - hj 1 / 16); Tertiary degree: Share of population with degree from university, university of applied sciences or PhD in 2015 (Statistischer Bericht A | 10 – j / 15, A VI 2 j / 15). **Stockholm:** Income: Mean income 2014 age group 20-64 years; Unemployment: Unemployment rate 2015 age 18-64; Mean Age: Mean Age 2015; Tertiary Education: Share of population with a tertiary degree (post-Gymnasie) age 25 – 64, 31/12/2015 (Statistical Year-Book of Stockholm 2017). **Software**: IBM SPSS Statistics. **Significance levels:** * = significant, ** = highly significant.

In three of the four data sets, donation levels are very much correlated with the local area's income, unemployment levels and education (see figure). Plausibly, people with a higher income are more willing to waive their deposit amounts. Based on Vastand and Lakemann, unemployment makes people perceive their financial situation as more precarious than being employed in a low-paid job that might yield a similar earning, which explains the even more sharp decline in areas with low occupation levels. Higher education comes with higher environmental-awareness and is linked to income, making this positive correlation also very plausible (Viscusi et al. 2013).

Interestingly, the mean age is not found to be correlated with donation levels in three of the donation data sets and showed a weak correlation in one. The willingness to donate grows, in general terms, quite linearly with age whereas the donated amounts grow disproportionately for elderly age groups. Thereby, the elderly usually account for huge shares of donations in society. In the case of deposit donations, however, the amounts cannot be infinitely maximized beyond everyday consumption (buying extra beverages for the sake of donations seems implausible). Lack of information on and familiarity with this new mechanism can also plausibly have the result of lowering deposit donation rates for elderly individuals, making their share less dominant both in absolute and in relative terms.

The recipients of the deposit donations in the observed sample are three charitable organisations in Germany (the Berlin foodbank *Berliner Tafel*) and Sweden (the *Swedish RedCross* and the Swedish environmental NGO *Vi-skogen*). The following table compares the socio-economic structure of the people who donate their deposit to those who benefit from the donations.

Organisation	Berliner Tafel	Vi-skogen	Swedish Red Cross
Location of Beneficiaries	Berlin, Germany	Africa	Mostly global, certain activities in Sweden
Socio-economic status of beneficiaries	In proven material and social need and poverty, disadvantaged social backgrounds	African communities which face dramatic challenges through deforestation and changed environmental conditions	Global: People in existential need through catastrophes Sweden: People in bodily harm
Share of budget	3% in 2015	8% in 2016	1% in 2016
Sources	www.berliner-tafel.de (as of 14/08/2017)	viskogen.se/om-oss/ (as of 14/08/2017)	Swedish Red Cross Activity Report 2016, Swedish Red Cross Annual Report 2016
Donation data set	Berlin Supermarket + Berlin Discounter	Sweden Supermarket A	Sweden Supermarket B
Socio-economic status of deposit donors			
Employment	Very unlikely to be unemployed		
Age	Weak or no correlation with age	No correlation with age	No correlation with age
Income	Likely to be disproportionately affluent	Very likely to be disproportionately affluent	No correlation with income
Education	Likely to be well-educated	Very likely to be well-educated	Somewhat likely to be well-educated

Deposit Donations as a Special Form of Social Involvement

Both urban deposit collections and deposit donations offer a certain kind of redistribution, but different groups benefit in the two cases. Whereas deposit collectors are not exclusively in poverty or existential need, this is the case for the beneficiaries of the three observed charitable organisations in this work. Therefore, the redistributive effect from a wealth or financial point of view is stronger for the deposit donations schemes.

However, the deposit collection offers more to the beneficiaries than just the added income: a perspective of a meaningful, independent, autonomous activity, a way to participate in public life and to (re-)gain self-respect. Therefore, it is important to highlight that deposit donations are not simply an upgrade or evolution of urban deposit collections. Bottle deposit donations might spare someone to search rubbish bins, but those persons are not necessarily the same beneficiaries. Consumers can choose whether they would like to support a specific cause, which requires them to return their container themselves, or whether they would like to spare the effort and, intended or not, support any of the efforts of the many collectors.

Whereas in typical charitable donation contexts, the willingness and the amounts of donations increase with age, such correlation could not be observed for deposit donations. The results of this work suggest that deposit donations are more suited to reach younger age groups than classic donation mechanisms. Perhaps this is because it is a form of social involvement that offers very low access barriers as only low sums are possible to donate, it is linked to consumption and the overwhelming majority of the population is going to a store anyway, reducing the additional opportunity costs. Another important aspect is that the person does not donate immediate money, but rather waives the right to get some money back. This greater 'donation power' of younger age groups could eventually be directly or indirectly translated into a bigger influence on the agenda, aims and procedures of the respective charitable organisations. Yet, perhaps in part due to the small amounts and lack of scalability, the financial impact of deposit donations is limited in scope. The observed charities finance less than 10% of their budget through deposit donations. As impactful as the amount might be in absolute terms, it is far from being able to sustain those organisations by itself (however, there might be significant immaterial benefits through additional publicity).

Through deposit collections, the political trend towards a more sustainable use of resources has been complimented by extra occupation opportunities for low-income persons. While they could be seen as a performance-based 'economic involvement', deposit donation schemes are a more genuine form of 'social involvement'. Through them, the social and charitable sector found a way to also benefit from the deposit-refund system that Germany and Sweden have introduced. The observed collaborations allow for a redistribution from comfortably affluent populations towards highly disadvantages groups and individuals. Deposit donations of the analysed kind seem to be a promising opportunity for charities to raise extra funds and an advertisement as the burden of effort is with the donors and infrastructure costs would traditionally be covered by the respective store. Importantly, they offer a new way of participation in social causes and seem to be an instrument to reach additional groups, in particular more young persons. Yet, it would be worth investigating whether deposit donations affect someone's donations overall by decreasing other types of donations. In this case, the added value of deposit donation schemes to social redistribution would have to be reconsidered.

Based on this analysis, a widespread implementation of deposit donation schemes seems to be socially advantageous since it undermines neither the deposit-refund system, nor in principle the opportunities of deposit collectors. Deposit donations offer an accessible way to engage financially in charitable contexts, which in particular seems to motivate younger shares of the population. They provide extra funds and visibility to

charitable organisations, while being easily compatible with the interests of the corporate sector. Thus, adding a donation box or button allows for additional, broad social involvement and additional redistribution channels without undermining any established form.

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