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BRIEFING

Best practices in quantifying the split incentives in the Private Rented Sector

Insights from the seminar:
Examples from quantifying the split-incentive problem in the private rented sector in the national level
To re-watch the seminar

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Split incentives, or landlord-tenant dilemma, can be defined as a situation in which "one party, the landlord, invests in energy efficiency, while the benefits produced are received by another, the tenant, who benefits from decreased utility costs and improved thermal comfort" (Papantonis et al., 2022).

There are various methods in literature for addressing the split incentives, although countries have not formally adopted a methodology and there is still lack of understanding in public authorities on how to perform such activities.
The importance of quantifying the split-incentive on a national level is that it provides essential information for policy formulation. More specifically, in the case of energy efficiency upgrades for buildings, subsidies can be better targeted and adjusted for the landlords and tenants if the degree of split-incentive is approximated. This is even more important in the case of energy poverty, where the split incentive is higher and without appropriate subsidy rates, the investments will not take place. In the following briefing, four different methodologies for quantifying split incentives are illustrated and accompanied by the recording of the thematic seminar.
The purpose of this brief is to assist policymakers, energy agencies and practitioners to identify ways for quantifying the split-incentive in their countries, based on the national tenancy market circumstances, data availability and own capacity to perform this task.

Methodology 1: Examining the split incentive problem in Greece
by Christos Tourkolias

The methodological approach taken to quantify the split incentives in Greece was structured as to follow three main steps.
Firstly, the evolution of renovation costs in the Private Rented Sector (PRS) was analysed by considering data taken from the Household Budget Surveys (HBS).
Thereafter, a survey was conducted involving both tenants and landlords, followed by the performance of structured interviews with key stakeholders.
The main objectives of the study were to:
i) map the potential regulatory and non-regulatory barriers;
ii) assess the potential regulatory and non-regulatory barriers; and
iii) draft policies and measures for tackling the identified barriers.

As previously mentioned, the first step of the process was to analyse the evolution of the renovation costs in Greece in the PRS by employing HBS data. It was found that the average expenses related to the renovation of buildings had generally decreased since 2008 up to 2020. Indeed, if in 2008 the average expenses related to the renovation of households was around 1,100 EUR, in 2020 it had decreased to around 500 EUR (Figure 1). Additionally, it was found that landlords spent more on average on renovations compared to tenants (Figure 2).

***Figure 1**: Evolution of average expenses for household renovations in Greece in the PRS from 2008-2020.*

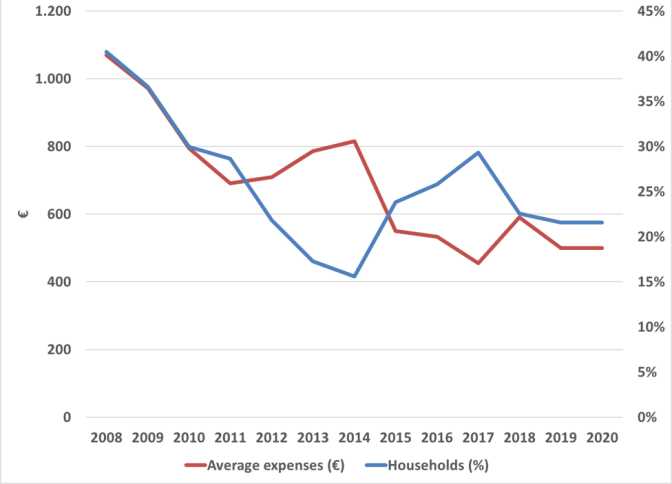
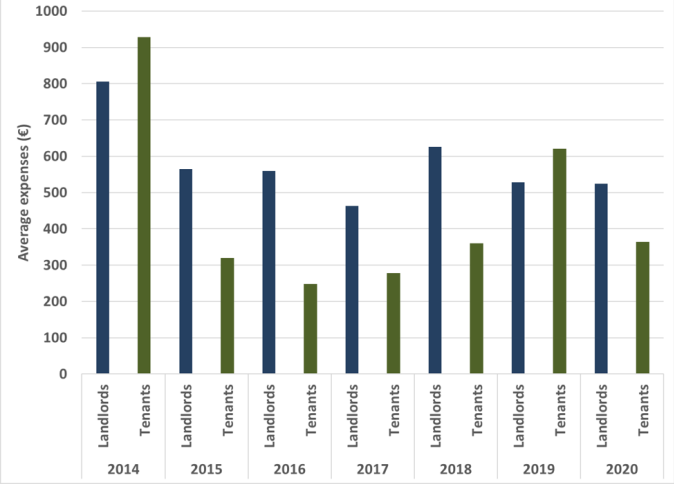


***Figure 2:** Evolution of average expenses for household renovations in Greece in the PRS divided per landlord and tenant.*



As second step in the process, a survey was conducted involving both tenants and landlords. The survey was conducted from 23.11.2021 until 01.01.2022 using two social media outlets, namely META and Viber. Two different structured questionnaires were developed for landlords and tenants. In total, 136 questionnaires were collected: 89 from landlords and 47 from tenants. The representative sample had a confidence level of 95% and a confidence interval of 10%. The main questions of the questionnaire can be found in Table 1.

When considering the landlords' perspective, it was found that the main reason for renovation was the increased value of the property and assets; whereas the most effective policy according to this group of interviewees was providing financial assistance to landlords.

Additionally, it was found that 8% of landlords supported the tenants' participation in the cost of the energy upgrade and that 12% of landlords supported the proposal for the tenants to cover the full cost of the upgrade provided that the amount (or a percentage) is deducted from the rent until the end of depreciation.

Table 1: *List of main questions asked in the survey.*

Main questions of the questionnaire
Investigation if the rental property has already been renovated including information about who covered the implementation cost
Willingness to improve the energy efficiency of the rental house in the coming years including the main reasons
Willingness to share the cost of the energy renovation including the identification of the main reasons
Assessment of the possibility for the tenants to cover the entire cost of the upgrade provided that the amount (or a percentage) is deducted from the rent until the end of depreciation
Determination of the maximum amount, which can be provided to allocate for the implementation of energy saving interventions in the buildings
Evaluation of the effectiveness of various proposed policy measures
Assessment of the potential role of the general assembly of the apartment building during the implementation of the energy efficiency measures
Information about the buildings
Demographic and socio-economic information of the participants

On the other hand, from a tenant's perspective, two main reasons for renovation were found, namely: energy cost reduction and improved thermal comfort.

Additionally, the tenants found five proposed policy measures to be highly effective, specifically: providing financial assistance to landlords; providing financial assistance to tenants; implementing an obligation of minimum energy performance requirements in rental housing; implementing an obligation to extend the duration of an existing lease in case that the tenant will cover the cost; and prohibiting rent increases for a specific period of time in case that the tenant will cover the cost.

It is worth noting also that 87% of the tenants supported the tenants' participation in the cost of the energy upgrade and that 50% of tenants supported the proposal for the tenant to cover the full cost of the upgrade provided that the amount (or a percentage) is deducted from the rent until the end of depreciation. The last step consisted in conducting structured interviews with key stakeholders. The main issues discussed can be found in Table 2.

Table 2: *Main issues touched upon when interviewing stakeholders.*

Main issues discussed when interviewing stakeholders
Identification of the main drivers for the energy renovation of the building stock.
Apportionment of energy upgrade costs between landlords and tenants.
Evaluation of a proposal for the tenant to cover the total cost of the energy renovation provided that the amount (or a percentage) is deducted from the rent until the end of depreciation.
Identification of potential problem with split incentives between landlords and tenants in Greece.
Effectiveness of the policy measures to address the split incentive problem.
Assessment of possible barriers due to the requirement for the consent of the general assembly of the apartment buildings for the implementation of the energy efficiency interventions.

The study performed in Greece utilising the hereby described approach reached a number of key conclusions.
Firstly, it was found that there is a **lack of an officially established framework for tackling split incentives, together with a low level of awareness and understanding of the issue at hand**. Secondly, it was found that only **a small percentage of landlords wants the tenants to contribute to the total cost of the energy renovation; whereas the vast majority of tenants wants the landlords to contribute to the total cost of the energy renovation**.

The two groups of interviewees also had **different reasons for wanting to renovate the household**, with landlords intending to increase the value of the building and reduce maintenance costs compared to the tenants intending to reduce the energy cost and improve thermal comfort. Lastly, it was found that even if the introduction of Minimum Energy Performance Standards (MEPS) was assessed as a very effective measure, **a well-balanced mixture of policies and measures is required**. In general, it is suggested: that there be a focus on the calculation of the real benefits both for landlords and tenants for the whole duration of the lease period; to tackle the obstacles for reaching consent during the general assembly of the apartment buildings; and to involve both landlords and tenants in the design of the required policies and measures.

Methodology 2: Split incentive in Croatia –free-based tenancy

by Anamari Majdandžić

According to Eurostat data from 2019, 89.7% of the Croatian population lived in a household where they were the owners, while the remaining 10.3% lived in rented housing as tenants. Nonetheless, this data does not reflect reality, as it was found that of this 89.7%, around 30% to 40% lived with their parents or were sharing the house with other family members.
Additionally, an unregulated market and unresolved property-legal relations contribute to the problem of lack of national data and the market operating in the shadow zone. **In general, Croatia presents higher numbers of percentage of the population presenting arrears on utility bills compared to the European Union (EU),** particularly in the social housing sector (Table 3).

***Table 3**: Overview of energy poverty indicators per strait of society*

		EU 27 (%)	Croatia (%)
Average	• Arrears on utility bills • inability to keep their house warm in social housing	• 7 • 7,8	• 21 • 7,4
Owners	• arrears on utility bills • inability to keep their house warm in social housing	• 5,6 • 6,4	• 20 • 6,7
Private rents	• arrears on utility bills • inability to keep their house warm in social housing	• 9 • 10	• 15,2 • 17,1
Social Housing	• arrears on utility bills • inability to keep their house warm in social housing	• 13 • 13,2	• 33,6 • 13,4

The first step was to understand the ownership situation in Croatia and to delineate which amount of people lived in their own property or in a rented one, by conducting a survey.
To obtain a higher reach, synergies with four other projects were found (POWERPOOR, EmpowerMed, EPAH and Bušeko), and as such, a total of 997 households involving 990,886 citizens were interviewed. It must be noted that each project focused in different cities, both continental and mediterranean Croatia were considered, both richer and poorer areas and finally both rural and urban areas.
The results of the survey were differentiated based on the city being analysed. For example, in Buševec, a little rural city of less than 1,000 people, mostly owners and not tenants were interviewed, showing no difficulty in paying heating, water or electricity bills or reducing the heating in rooms to save energy. **Similarly, biomass was found to be the main form of renewable energy used in the household.** On the other hand, when considering a more energy poor city, such as that of Križevci, it was seen how the majority of residents were owners of houses and that the majority of these were aged 60 years or older. Nonetheless, independent from the property ownership situation, the majority of households said to feel colder when sitting next to the closed window compared to other parts of the house, indicating bad insulation and a situation of energy poverty.

When analysing mediterranean Croatia and more specifically Zadar, it was found that the majority of owners did not profit from social benefits, whereas the majority of those living in a property that they did not own without paying a fee, or in a social apartment, did indeed receive social benefits.
Similarly, the majority of homeowners said to have sometimes difficulties in paying bills, whereas the majority of tenants said to have very big difficulties. This showed that mediterranean parts of Croatia presented greater difficulties when compared to the continental ones.

Lastly, energy poor households in the capital city of Zagreb were interviewed. It must be considered that this is the richest part of Croatia and thus the majority of respondents said they had never been late paying utility bills solely for financial reasons in the previous 12 months. Additionally, it was found that the majority of respondents did not apply any energy efficiency measure since the building was built; however, most of those that were not the owners of the building were not sure how to answer. This shows, as expected, greater interest in energy efficiency improvements by owners rather than tenants. Nonetheless, this still shows a very low interest in energy efficiency improvements considering also this is the richest part of Croatia. Lastly, of those that had installed renewable energy systems, the majority had installed biomass heating systems.

Several conclusions were gathered from the four different surveys.
Firstly, the main problem was found to be a **lack of definition of energy poverty and criteria of energy poverty on a national level**.
Secondly, the **implementation of financing measures within energy renovation programmes for multi-apartment buildings for supporting both landlords and tenants are critical for the conformation of energy poverty in the PRS**.
Thirdly, there is an interest in the program and public calls, but **most citizens are concerned about administrative paperwork and applications being too complicated**.
Fourthly, there is a **lack of funds due to the number of interested applicants**; the citizens are not sure if they are willing to invest money and time to apply for a call but at the same time are not sure whether they would reconstruct their building with their own funds.
Fifthly, **the biggest inconvenience for citizens is to collect more than 50% of co-owners' signatures to be able to apply and go for subsidised renovation**, because most of the apartments are rented and landlords are not interested in investing in the apartments they rent.
Lastly, there are split intiatives that occur between apartment owners who live in these apartments and apartment owners who rent the apartment that should be tackled.

Methodology 3: Split Incentive Effects on the Adoption of Technical and Behavioural Energy-saving Measures in the Household Sector in Western Europe
by Hongguang Nie

With an average 30% of total energy consumption in developed countries, **the residential sector has become one of the largest energy-consuming sectors**. **Nearly half of all residential dwellings are rental properties in Europe**. Different incentives between owners and occupants of dwellings can cause the over-consumption of energy. Energy waste caused by these types of ill-directed incentives might be expected to be quite huge, originating from both an underinvestment in technical energy-saving measures and a low frequency of daily energy conservation behaviours. The aim of this study was to quantify the magnitude of split incentive problems in three Western European countries, simultaneously focusing on technical and behavioural energy-saving measures. Two main types of split incentives for residential energy-saving measures were delineated and these can be found in Table 4.

Table 4: *Types of split incentives analysed.*

	Occupants can invest in Energy Efficiency (EE) technology (owner)	Occupants can invest in Energy Efficiency (EE) technology (renter)
Occupants pay the energy bill	**Case 1:** No split incentives	**Case 2**: Investment split incentives
Occupants do not pay the energy bill	**Case 3**: Both investment split incentives and behaviour split incentives	**Case 4**: Behaviour split incentives

The optimal decision of energy-saving measures was modelled as a function of whether the household members (i) own the dwelling (Own_i). Other factors involved a variety of household characteristics (C_i), household members' willingness to pay extra for greenness (W_i), environmental concerns (E_i), and environmental beliefs (B_i). The full formula is:

$$Y_i = \alpha + \beta Own_i + \sum_c \gamma_c C_{i,c} + \sum_w \theta_w W_{i,w} + \sum_e \delta_e E_{i,e} + \sum_a \varphi_a B_{i,b} + \omega_i$$

The average marginal effect (AME) was used to further investigate the split incentive effects, which indicate the difference between homeowners and renters regarding the probability of adopting the energy-saving measures in question. This was defined as:

$$AME = E[P(Y_i = 1 | X_i, Owner) - P(Y_i = 1 | X_i, renter)]$$

A positive AME entails that, relative to renters, homeowners were more likely to adopt an energy-saving measure.
For a certain energy-saving measure, the magnitude of AME could provide a quantitative measurement of the split incentive effect.

The three analysed countries were Belgium, Germany, and the Netherlands and as a first step, a questionnaire was formulated to understand:
i) demographic factors and basic information;
ii) adoption of household energy-saving measures;
iii) motivations for adopting energy-saving measures.
The survey differentiated between owners and renters, and between technical energy-saving measures and behavioural energy-saving measures. Additionally, more owners were interviewed than renters. Thereafter, the AME was calculated using five different models.
Three main conclusions were reached from this study.
Firstly, **for technical energy-saving measures, homeowners were 25.6%, 10.2%, 13.5% and 15% more likely to adopt the energy-saving measures of thermal insulation, solar panels, efficient boilers, and LEDs, respectively**.
Secondly, **for behavioural energy-saving measures, homeowners were 5.5%, 5.9%, 4.2% and 1.5% more likely to adopt energy-saving measures of "setting the thermostat to 20 degrees Celsius or below", "turning the heat down at night", "closing the windows when the heat is running", and "turning off lights in empty rooms", respectively**.
Lastly, **the split incentive effects were very robust across different countries when controlled for plausible alternative specifications, including household characteristics, willingness to pay extra for greenness, environmental concerns, and environmental beliefs.**

Methodology 4: Split incentives and energy efficiency in Canadian multi-family dwellings

by Lucie Maruejols & Denise Young

The main objective here was to understand who pays the utility bills between landlords and occupants and how does this affect final energy consumption. Data for the Canadian Survey Household Energy Usage (SHEU) from 2006 was analysed, gathering 4551 Canadian households, of which 1244 were multi-family. These were split between duplex/double/row/terrace (DDRT) and low-rise apartments (LRA). High-rise buildings and buildings built before 1920 were excluded. Additionally, it was differentiated between "rental units" and "owned condos", or "owner-occupied units".

Thereafter, these categorisations were combined, and it was analysed when the occupant paid the utility bills compared to when the landlord paid the utility bills.
It was found that, in rental units, the landlords paid for natural gas and oil, whereas the tenants paid for the electricity. On the other hand, in owned condos, natural gas was paid via condo fees. Hence, it was questioned what the effect of bill payment arrangement would be on: energy consumption and energy efficiency behaviour.

When analysing the renters of DDRT-style dwellings, it was found that, **when a tenant did not pay for utility bills, he/she would tend to present higher energy consumption, higher indoor temperature, and lower adoption of energy-saving behaviour**.
Nonetheless, such analysis presented some limitations, namely that: energy consumption is often inputted by surveyors and other characteristics may influence energy consumption and behaviour, such as the insulation of the building or the amount of time spent by the resident indoors. For this reason, econometric models were applied. The objective of such model was to understand the effect of utility payments on temperature settings (i.e., how this varies during the different periods of the day through a standard regression model) and the energy saving behaviour (through probit regressions).

Two specifications were applied.
First, by taking pooled data for all households living in multi-family dwellings, dummy variables were employed to analyse whether or not the occupant pays for the bills and whether or not the dwelling is occupied by an owner or tenant.
In the second specification, a split sample was taken according to whether or not the occupant pays for the bill and, in order to take into account the reasoning behind whether a tenant wishes to pay for their own bills or not, the Heckman's two-step selectivity estimation technique was employed.
The pooled data was controlled and examined by considering: the decade of construction of the building, the main type of fuel used for heating, the type of building, its location, the energy prices, the household characteristics and the annual income range.

Conclusion:

Many occupants of multi-family dwellings do not pay directly for electricity or heat

The resulting "split incentives" do impact the efficiency of energy use and data suggests that these impacts are often significant

Households who do not directly pay for heat opt for increased thermal comfort: policymakers should consider targeting especially these households.

Nota bene: Summary statistics have limitations (e.g., the energy used is inputted). Whereas econometric models were used to split the data between sample models, it is difficult to identify which energy sources go with which usage.

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