

Circular ownership and financial crime: risk profiling of the Malta gambling division

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The present research aims to test the relation between circular ownership and financial crime. The approach involves calculating company-level variables based on ownership information and further using them to identify distinctive groups of risk structures with evidence of circular patterns. To this end, we collect data on companies active in the division of gambling and betting activities in Malta and further combine them with information on enforcement actions imposed on Maltese companies, their beneficial owners, intermediate shareholders and subsidiaries. Correlation analysis and statistical testing were performed to assess the individual relevance of ownership variables, while clustering analysis was employed to distinguish between different criminal strategies involving circular patterns. We conclude that the inclusion of circular ownership information greatly supports risk assessment activities.

Keywords: ownership structure; circular ownership; clustering analysis; risk assessment; risk profiling; financial crime.

Author's note: The present document is a first draft of a more comprehensive study that will be completed by Dec 2021.

Introduction

It has been well established that one of the most critical factors determining the abuse of legal persons and legal arrangements by criminals is the potential for anonymity (OECD 2001), hence the extensive use of a variety of shady financial instruments and complex schemes that are usually composed of cross-border links between parent companies, intermediate shareholders and subsidiaries (Sharman 2010; van der Does de Willebois et al. 2011; Savona and Riccardi 2017; Garcia-Bernardo et al. 2017; Transcrime 2018; Knobel 2019a; Knobel and Seabarron 2020; Habershon, Krause, and Szytkowski 2020; Jofre et al. 2021). It is therefore reasonable that beneficial ownership transparency is established as one of the pillars of the Anti-Money Laundering (AML) legislation, both

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at European and international level (FATF 2012; Transparency International 2021; UK Government 2021).

Despite the high political commitment, there is a dearth of empirical research on corporate opacity and anomalous ownership structures. However, some evidence has been found on the employment of circular ownership schemes as to hamper the identification of ultimate owners lying behind legal entities (Knobel 2019b). Circular ownership happens when two or more legal entities own each other, directly or indirectly, making it difficult to understand who the real owner is. Currently, many countries prohibit the use of circular ownership structures. The Maltese legislation, for example, explicitly prohibits companies from having shares in firms acting as their owners.² Nevertheless, very few empirical studies investigated these structures. In its White Paper, T-Rank AS (T-Rank AS 2017) took into consideration circular ownership chains to estimate the voting power of direct and indirect shareholders of companies.³ In addition, Global Witness found that 487 of the UK companies analysed (0.01% of the sample) were involved in circular schemes (Global Witness 2019).

This study aims at detecting companies involved in financial crime by addressing the above-mentioned gap. In particular, it considered different entities conforming an ownership structure and their connections within the network, and further assessed the contribution of circular ownership flags to the identification of criminal firms and their modus operandi. The focus was on Malta, and specifically on the gambling and betting activities division, due to the vast evidence found on transparency issues (Transcrime 2021). As a matter of fact, FATF has recently added Malta to its so-called grey list of countries under increased monitoring (FATF 2021b, 2021a), hence the incentive to empirically assess ownership structures involving circular patterns and their connection to financial crime in a highly relevant environment.

² Art. 110, Companies Act, Act XXV of 1995, Cap. 386, <https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/86862/98597/F924497279/MLT86862%202017.pdf>.

³ The definition of voting power adopted by T-Rank AS (2017) is the following: ‘A shareholder S’s voting power in a company C is equal to the a priori probability of S being pivotal for the outcome of a vote in C’. Check the White Paper for further details.

Methodology

The present study developed an analytical approach to be used for risk assessment purposes that aimed at translating ownership information into easy-to-calculate company-level variables, identifying circular ownership patterns and further using this information to generate distinctive risk profiles.

Data

Data on firms and their ownership structures were retrieved from Bureau van Dijk's *Orbis Europe*.⁴ The collected dataset is a snapshot of 529 Maltese companies active in the division of gambling and betting activities during the month of June, 2019. This included information on:

- Beneficial owners (BOs):⁵ any natural person(s) who ultimately owns or controls the customer and/or the natural person(s) on whose behalf a transaction or activity is being conducted.⁶
- Other ultimate beneficiaries (OUBs): when it is not possible to identify an individual at the top of a chain, then the top shareholder is referred to as Other Ultimate Beneficiary.
- Intermediate companies: all entities separating a company from its BOs or OUBs.
- Subsidiaries: entities that are owned by the company, either as direct subsidiaries, that is, firms directly owned by the company at issue, and as indirect subsidiaries, that is, subsidiaries of subsidiaries.⁷

Data on enforcement actions are obtained from LexisNexis *World Compliance*⁸ and further matched with *Orbis* data. This includes information on firms, BOs, intermediates and subsidiaries with enforcement provisions (e.g. arrests, final judgments) and court filing around the world, which were collated from various

⁴ Dataset provided by Bureau van Dijk.

⁵ Following standards suggested by FATF, the threshold set by most countries for identifying BOs is 25%. However, we decided to reduce the limit to 10% in order to take a more conservative approach and extend the analysis to the widest number of possible owners.

⁶ Art. 3, par. 6, EU Directive 2015/849, as amended by the EU Directive 2018/843.

⁷ We set a maximum range of 10 levels of subsidiaries, but the dataset under study presented a maximum of 7 levels.

⁸ For more information, see: <https://risk.lexisnexis.com/global/en/products/worldcompliance-data>

sources, including national law enforcement reports, press releases and statements from public authorities. For the purposes of our analysis, all categories of crimes and predicate offences covered by LexisNexis were considered.⁹

Variables

We focused the analysis on ownership information, which relate to the different entities of the ownership structure and the relations that connect them (Figure 1). The unit of analysis is the firm itself, that is, the company that has been identified to be active in the gambling division in Malta. All related variables are therefore measured on a company-level basis and further confronted with enforcement actions that also relate to the firm.

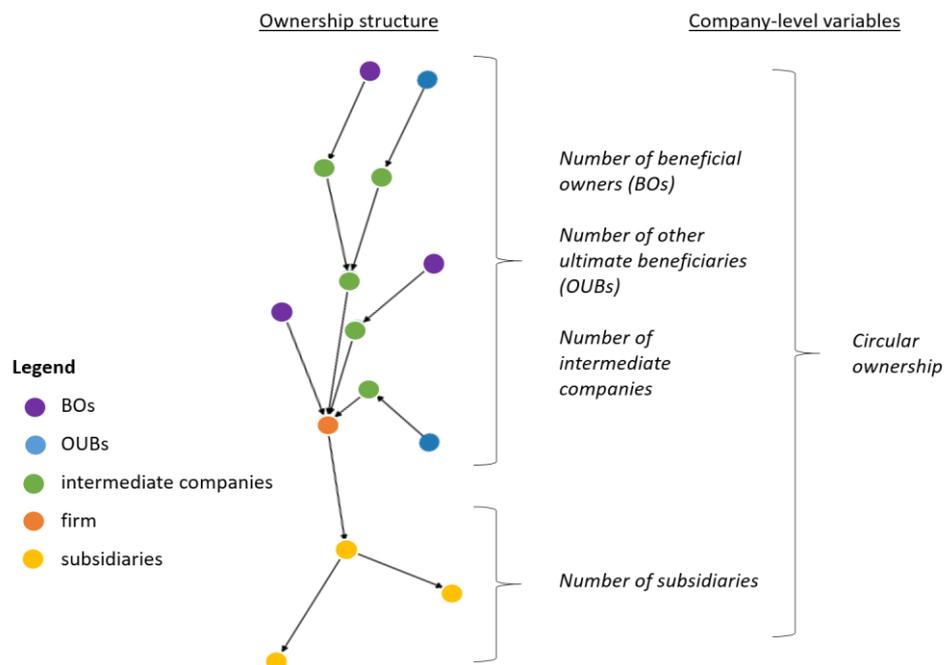


Figure 1: Visualization of ownership structure and company-level variables

We selected variables that account for the number of nodes of different types, including BOs, OUBs, intermediates and subsidiaries. We further expanded the analysis by taking into consideration the presence of circular ownership schemes. Circular ownership schemes are present in a structure when a company owns another company and, simultaneously, it is directly or indirectly owned by it. The reciprocal ownership

⁹ The enforcement categories in which entities are classified by Lexis Nexis *World Compliance* repository respond to an internal hierarchy. For more details see: <https://risk.lexisnexis.com/global/en/products/worldcompliance-online-search-tool>.

between companies can be direct, that is company A owns company B and vice versa, or indirect, that is company A owns company B, B owns C and then C owns A, which then can be extended to more than three nodes. In order to account for this feature, we generated a flag aimed at identifying circular patterns within the entire ownership chain. Structures involving circular patterns are found to be very simple, with only two nodes directly interacting to each other in isolation (first case, Figure 2) as well as embedded in more complex schemes (two cases on the right).

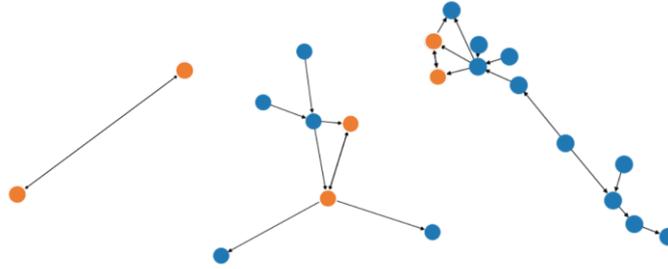


Figure 2: Identified cases of circular ownership schemes (in orange). The first structure refers to a directly reciprocal scheme without external (known) links, while the last two depict circular patterns embedded in larger and more complex structures.

Table 1 provides some descriptive statistics of the variables considered. We can see that only 10 companies within the sample presented evidence of circular ownership (i.e. 2%), which suggests that the use of this kind of schemes is a rare event.

Variables	Count	Mean	Std	Min	25%	50%	75%	Max	Sum
Number of BOs	529	1.147	2.457	0	0	0	2	44	607
Number of OUBs	529	0.792	0.768	0	0	1	1	5	419
Number of intermediates	529	2.030	2.939	0	0	1	2	28	1074
Number of subsidiaries	529	0.516	3.293	0	0	0	0	68	273
Circular ownership	529	0.019	0.136	0	0	0	0	1	10
Enforcement actions	529	0.110	0.313	0	0	0	0	1	58

Table 1: Descriptive statistics.

Methods

The use of analytical techniques are at the base of the proposed risk assessment methodology and involved two main task, including (i) the assessment of individual usefulness of company-level variables and (ii) clustering analysis. The first task of

individual assessment is a two-fold approach, first by calculating the Pearson correlation between the variables and crime, and then by means of statistical testing as to better assess differences between enforced and non-enforced firms. For the second task of clustering, we selected companies with evidence of circular ownership and further distinguished between risk groups using a K-Means algorithm.

Results

The hypothesis of this study is that information of circular ownership structures, duly transformed into a dichotomous variable (i.e. presence or non-presence), can be used to distinguish criminal from non-criminal firms and to further profile distinctive patterns.

Risk assessment

The detection power of the considered variables is determined, first, via correlation analysis, and then, by means of statistical testing. Table 2 shows the degree of association between the variables and evidence of crime, while Table 3 reveals t-test results. Overall, we can say that three out of the five variables considered are significantly and positively correlated with crime, including the circular ownership flag that is significant at a 0.01 level.

Variables	Pearson correlation	P-value
Number of BOs	0.026	0.555
Number of OUBs	0.056	0.201
Number of intermediates	0.145***	0.001
Number of subsidiaries	0.193***	0.000
Circular ownership	0.129***	0.003

*Table 2: Correlation between variables and evidence of crime.
Significance level: *** p -value < 0.01, ** p -value < 0.05, * p -value < 0.1.*

T-test results confirmed previous finding and further showed that all company-level variables presented larger average values for the enforced class compared to the non-enforced group. Firms connected to crime, in particular, tend to be more embedded in ownership structures involving circular patterns as almost 7% of criminal firms presented this feature while only 1% of non-criminal ones did.

Variables	Enforced (Mean)	Non-Enforced (Mean)	t-Stat	P-Value	sig.
<i>Number of observations</i>	58	471			
Number of BOs	1.328	1.125	0.592	0.555	
Number of OUBs	0.914	0.777	1.281	0.201	
Number of intermediates	3.241	1.881	3.358	0.001	***
Number of subsidiaries	2.328	0.293	4.522	0.000	***
Circular ownership	0.069	0.013	2.986	0.003	***

*Table 3: T-test results for all variables.
Significance level: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1.*

Risk profiling

Next, we focused on companies showing evidence of circular ownership schemes and filtered out companies not presenting this feature. Then, a clustering analysis was conducted first, to identify the optimal number of clusters and second, to assess differences between them. By doing so, we were able to identify three different risky patterns involving different features of the ownership structure. As it can be depicted in Table 4, three out of the four clusters presented evidence of crime hence considered for the next profiling exercise.

Variables	Whole sample	Cluster 1	Cluster 2	Cluster 3	Cluster 4
<i>Number of observations</i>	10	2	1	1	6
Number of BOs (mean)	0.8	0	0	1	1.17
Number of OUBs (mean)	1.4	2	1	2	1.17
Number of intermediates (mean)	1.4	0.5	0	3	1.17
Number of subsidiaries (mean)	12.5	9	68	20	3.17
<i>Evidence of enforcement</i>	4	2	1	1	0

Table 4: Descriptive statistics of companies involved in circular ownership, first considering the entire sample, and then by cluster.

Cluster 1

The first cluster involved two ownership structures that turned out not to be particularly complex or large (Figure 3). None of these networks presented information on BOs and

only one intermediate was present within the structures at issue. Moreover, both structures presented 2 OUBs and 9 subsidiaries. It can then be said that this cluster is characterised by the relatively large presence of OUBs and subsidiaries.

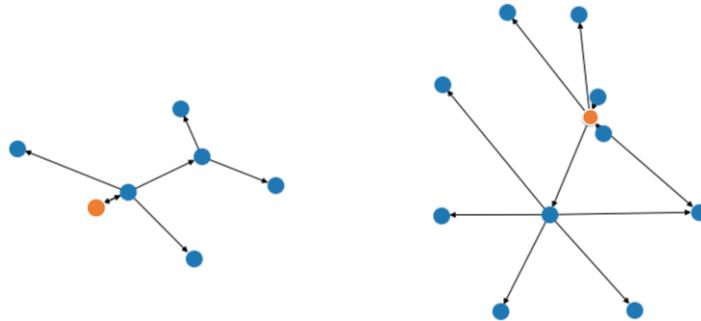


Figure 3: Cluster 1 ownership structures.

Cluster 2

The second cluster of circular ownership illustrated a single case of a firm with almost no owners but a very large number of subsidiaries. The identified company (Figure 4) was embedded in a corporate structure that involved 11 first-level subsidiaries and 68 subsidiaries in total.

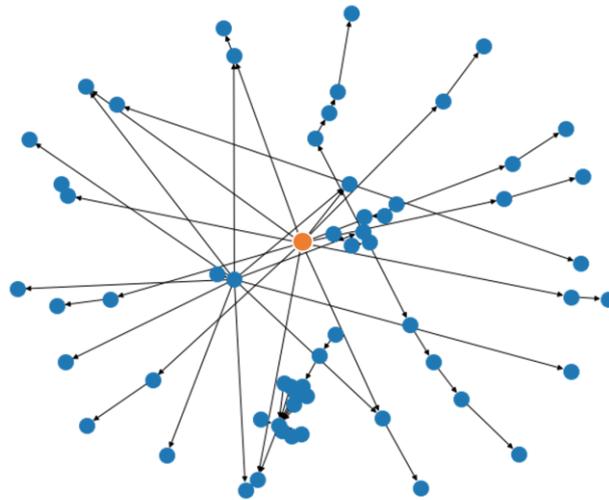


Figure 4: Cluster 2 ownership structure.

Cluster 3

The third cluster also involved one single ownership structure (Figure 5). Nevertheless, this structure presented information on many entities as it accounted for one BO, 2 OUBs and 3 intermediate shareholders. In addition, it presented a significant number of

subsidiaries. Therefore, it can be said that this cluster is characterised by a relatively large and well-diversified ownership structure with evidence of circular patterns.

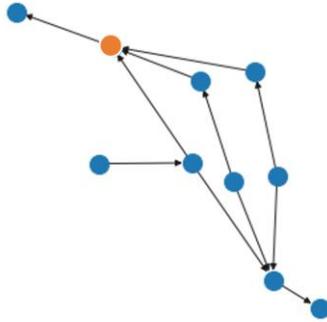


Figure 5: Cluster 3 ownership structure.

To sum up, we can say that the variable related to circular ownership showed evidence as acceptable proxy of risk of financial crime and that it can be of help for detecting risky firms and identifying distinctive modus operandi.

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