



# Money laundering as a service: Investigating business-like behavior in money laundering networks in the Netherlands

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## Abstract

In order to launder large amounts of money, (drug) criminals can seek help from financial facilitators. According to the FATF, these facilitators are operating increasingly business-like and even participate in professional money laundering networks. This study examines the extent to which financial facilitators in the Netherlands exhibit business-like characteristics and the extent to which they organize themselves in money laundering networks. We further examine the relationship between business-like behavior and individual money launderers' position in the social network. Using police intelligence data, we were able to analyze the contacts of 198 financial facilitators who were active in the Netherlands in the period 2016–2020, all having worked for drug criminals. Based on social network analysis, this research shows that financial facilitators in the Netherlands can be linked in extensive money laundering networks. Based on the facilitators' area of expertise, roughly two main types of professional money laundering networks can be discerned. Some subnetworks operate in the real estate sector, while others primarily engage in underground banking. Furthermore, the application of regression models to predict business-like behavior using individual network measures shows that facilitators with more central positions in the network and those who collaborate with financial facilitators from varying expertise groups tend to behave more business-like than other financial facilitators.

**Keywords** Money Laundering · Financial Facilitators · Organized Crime · Social Network Analysis

## Introduction

How do professional money launderers organize their business? Despite the high estimated amounts of criminal money laundered and the various far-reaching measures taken against money laundering, sound empirical research investigating the link

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between illegal revenues and the legal economy is scarce. As a result, anti-money laundering policies are, largely, based on untested assumptions about how criminals launder their illicit revenues and the extent to which they use professional money launderers when doing so.

The Financial Action Task Force (FATF), an intergovernmental organization dedicated to developing anti-money laundering policy, describes the phenomenon of professional money launderers in a report titled 'Professional money laundering' (FATF 2018). According to the FATF, professional money launderers are persons who launder illicit money for third parties in exchange for financial compensation. Professional money launderers are typically not involved in predicate crimes but are explicitly hired to transfer illegal revenues to the legal economy. The report states that despite the use of the term 'professional', professional money laundering is not limited to specific protected professions, such as lawyers, notaries public, or legally recognized trust sector offices. The FATF report, for example, also mentions underground bankers and unlicensed tax advisors. What is 'professional' about professional money launderers is that they are in the 'money laundering business', offering financial crime as a service. In addition, the FATF-report suggests that professional money launderers can collaborate on projects. In that case, professional money laundering networks come into play.<sup>1</sup>

The presence of professional money launderers is in itself not a new finding. Various academic publications report the existence of people who can be hired for or have specialized skills in money laundering (Cuellar 2003; Lacey 1991; Levi and Soudijn 2020; McCarthy et al. 2015). However, little is known about possible collaborations between these professional money launderers. Prior research has shown that specific subgroups, such as underground bankers tied by shared ethnic or familial backgrounds, tend to cooperate (Passas 1999; Siegel and van de Bunt 2014). Nevertheless, it is still being determined to what extent the money laundering market as a whole is interconnected. This lack of knowledge is possible due to professional money launderers often being the subject of small case studies (e.g., Farfán-Méndez 2019) or only appearing in the periphery of more extensive networks of criminals involved with predicate crimes (e.g., Malm and Bichler 2013).

This article expands the scarce existing research on possible collaborations between money launderers. The intensive research partnership between academics and law enforcement in the Netherlands provides the unique opportunity to use quantitative police registration data to study a large sample of professional money launderers and the extent to which they are interconnected. The police registration data available for the current study consist of a nationwide sample of 198 professional money launderers, the type of service they provide, and their contacts within these cases. These data allow us to examine levels of business-like behavior of individual professional money launderers. Indicators of behavior that, in the current study, are considered as business-like are involvement in multiple cases, the

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<sup>1</sup> The 2019 EU Drugs Markets Report (EMCDDA/Europol, 2019) even speaks of money laundering *syn-dicates*. Though the term suggests the worst, it appears that they just describe professional money laundering networks as they were described by the FATF (2018).

number of (returning) criminal contacts,<sup>2</sup> and the absence of familial relationships (see below). The data also allow us to examine the amount and structure of the links between professional money launderers. Using Social Network Analysis (SNA), the two main questions this article seeks to answer are 1) to what extent do professional money launderers display business-like behavior, and 2) do professional money laundering networks in the Netherlands exist?

The next paragraph first describes a possible distinction in the level of professionalism of money laundering behavior. Subsequently, it discusses the problems money launderers solve for organized crime offenders and the *raison d'être* of money laundering networks. Lastly, it includes a short overview of what is known about money launderers from prior SNA studies. The following paragraph outlines the research questions and hypotheses of the current study, whereas the paragraph 'Data and Methods' provides more information about the police registration data used, the operationalization of important concepts, and the methods which were employed. We also comment on the usefulness of a network approach more generally and highlight important insights and considerations with regard to network data quality. Subsequently, we present the results of the analyses, followed by a conclusion and discussion.

## Background

### What is 'professional' about professional money launderers?

To study professional money launderers, it must be clear who is considered a professional money launderer. In literature, there are slightly different views on who can and cannot be considered a professional money launderer. Malm and Bichler (2013) distinguish three types of money launderers. The 'self-launderers' who launder their illegal revenues earned through their involvement in predicate crimes in the illegal (drug)market. Next, 'opportunistic launderers' who launder for one criminal with whom they have a familial or social relationship. Lastly, 'professional launderers', which are in Malm and Bichler's specific use of the term, legally certified experts, such as lawyers, accountants, or notaries, who are hired by criminals because of their financial expertise; they are exclusively involved in laundering criminal proceeds and are themselves not involved in the predicate crimes.

Judges, however, also convict persons without a legal occupation or -background for performing money laundering activities. Similar to the 'professional launderers' described by Malm and Bichler (2013), these individuals are also not involved in the predicate crimes, nor do they have familial or social connections to the criminal, but are exclusively hired for their financial expertise (Soudijn 2014). Soudijn (2017), therefore, argues that anyone can act as a 'financial facilitator' as long as they assist

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<sup>2</sup> Criminal contacts may include customers as well as money mules or straw men. While financial facilitators are in essence criminal contacts of other financial facilitators, financial facilitators are not included in our 'criminal contacts' category but form their own group in our analyses.

a criminal with money laundering in some key way. What makes a money launderer or financial facilitator ‘professional’, is the extent to which the relation between the money launderer and the client is market-based, and there is an absence of obligations between parties “other than that of the fulfillment of the terms stipulated in the (formal or informal) agreement underlying the exchange” (Von Lampe 2016). The 2018 FATF report on professional money laundering also seems to interpret ‘professional’ in this latter way (FATF 2018). Here, we, therefore, let ‘professional’ refer to the way in which money laundering is provided as a service (instead of a qualification of certain legal professions).

While the study of Malm and Bichler (2013) shows that drug criminals mostly choose to launder their own money and that professional launderers are rarely involved, Soudijn (2014) argues that these results are to be expected, since not every criminal makes enough money to have a need for – or to be able to afford – the services of a professional money launderer. Based on a case file analysis of 31 Dutch organized crime investigations, Soudijn shows that professional money launderers are often involved in cases related to the large-scale importation of cocaine.<sup>3</sup> Based on these results, it can tentatively be concluded that professional money launderers are involved only when the financial stakes are high and that such professionals are perhaps only needed – and worth their cost – if they provide money laundering services that offenders cannot carry out themselves.

### Professional money laundering in practice

The goal of professional money launderers’ involvement is to solve the logistic bottlenecks criminals encounter when they want to spend their illegal revenues in the legal economy. Since transactions in the regular drug market are typically done through cash payments, this leaves drug criminals with the challenge of spending large sums of cash money without attracting attention from the authorities (Schneider and Windischbauer 2008). The problems criminals encounter are diverse and depend on the type of crime, the amount of criminal money involved, an offender’s financial goals, and, lastly, a country’s anti-money laundering regime (Levi and Soudijn 2020).

Firstly, the type of crime determines the type of payment. The money laundering process that possibly needs to be selected depends on whether criminal proceeds come in cash, electronic form, or barter (Levi and Soudijn 2020). While white-collar criminals normally generate illegal proceeds that are already in the financial system (which can, therefore, relatively easily be moved around to finance a purchase), drug criminals mainly generate proceeds in cash which, at first, needs to be converted to electronic form after which it can be transferred, and purchases can be made (Levi and Soudijn 2020).

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<sup>3</sup> Professional money launderers are present in almost half of the sampled cases, and this, however, does not mean that they are absent in the other half of the cases because there turns out to be a strong correlation between having a financial focus at the start of an investigation and the detection of professional money launderers during the investigation.

Secondly, the amount of criminal money involved determines the measures that should be taken to safely spend the illegal revenues (Levi and Soudijn 2020). Small amounts of cash can be spent in the legal economy relatively easily, but this becomes trickier when quantities rise. Because of anti-money laundering regulations, large cash transactions will be flagged as ‘unusual’ and investigated by banks and the Financial Intelligence Unit (FIU) and can possibly initiate a criminal investigation. Furthermore, small amounts of cash can easily be moved across the border. However, transporting cash becomes a risk when the quantities involved become more substantial. Especially when the criminal cannot provide legal provenance of the money involved when intercepted by, for instance, customs officials.

Thirdly, the problem of offenders who want to use illegal earnings in the legal economy depends on their financial goals (Levi and Soudijn 2020). If consumption is the goal, cash is generally accepted to buy luxury goods. However, if an investment is the goal, for instance, by purchasing real estate, it becomes harder to use cash without leaving a paper trail or alerting the authorities, especially in Northern Europe.

Lastly, offenders can encounter problems when they want to move their criminal gains to a different country. Important reasons for transferring money abroad are to spend it in a country with a less strict anti-money laundering regime (Levi and Soudijn 2020), or to store it in a country with strong banking secrecy (Ping 2004). Again, this is not without risk. Not only is moving large sums of cash across the border a hazardous undertaking, the same applies to using the official banking system for international transactions.

Given the variety of problems criminals encounter when having large sums of cash available, and assuming the stakes are high enough and the criminal himself lacks the required financial knowledge, it’s clear that there will be a need for a diversity of money laundering services (Levi and Soudijn 2020). Criminals wanting to invest their criminal gains, for instance, in real estate in the Netherlands, face different problems compared to when they choose to physically transfer the cash to South America, where it can be spent or invested relatively easily (Kruisbergen et al. 2012).

There are various ways in which illegal cash flows can be kept out of sight (Kruisbergen et al. 2012). A Dutch study by Kruisbergen et al. (2015) into the investments of 1,196 convicted organized crime offenders showed that investments are often made in real estate. Offenders do so first and foremost because they need a place to live. In addition, the value of real estate is high, and it is usually a safe, long-term investment. Furthermore, factors such as erratic price fluctuations, speculations within the real estate market, and a lack of price transparency make real estate an attractive investment for those wanting to launder their money. Finally, ownership of real estate can often be concealed through the use of legal entities (Levi and Soudijn 2020; Soudijn 2018).

Financial facilitators who help offenders to invest in real estate integrate the criminal money into the legal economy. Many financial facilitators who become subjects of attention in police investigations are operating in the real estate sector, such as real estate traders, notaries public, and estate agents (Ferwerda et al. 2007; Soudijn 2017, 2018). Real estate traders, for instance, may provide the opportunity to invest

in real estate, whereas real estate agents can keep buyers and renters out of sight of the authorities (Soudijn 2017). On the other hand, notaries public are responsible for the financial transactions, have a duty of confidentiality and have an escrow account (Ferwerda et al. 2007).

While complex money laundering structures may be involved, offenders and financial facilitators can also launder money in much simpler ways. Sometimes moving the money to another person in another country, for instance, through money transfers, may suffice to use illegal proceeds in the legal economy (Kruisbergen et al. 2012). While money transfer offices (MTOs) usually are legal, financial institutions, transferring money to another country can also take place outside the official financial system via underground banking, also called Informal Value Transfer Systems (Passas 1999). Underground bankers generally operate on a global scale and are able to handle large cash transactions (Siegel and van de Bunt 2014). For criminals, the benefits of underground banking are its unofficial character, its anonymity and efficiency, and the possibility to disburse large sums of money in a different country on a regular basis (Kruisbergen et al. 2012).<sup>4</sup>

Just as notaries public, lawyers are also interesting to criminals as financial facilitators because of their duty of confidentiality and their escrow account (Soudijn and Akse 2012). Lawyers may abuse their escrow account, be involved in forgery, and perform transactions later considered suspicious by the Financial Intelligence Unit (Soudijn 2017). By performing transactions and creating false paper trails, they enable criminals to use their illegal gains in the legal economy. In addition to lawyers, ex-lawyers, jurists, or legal advisors (FATF 2018), tax or financial advisors are also known to offer their services as financial facilitators (FATF 2018; Levi and Reuter 2006). Several studies show that accountants function as financial facilitators, for instance, by being connected to a cash-intensive company – such as a barber shop, video arcade, or currency exchange company – to ‘fix the books’ or by falsely making a financial statement to keep the real owner of the company out of sight (FATF 2018; Malm and Bichler 2013; Savona 2014; Soudijn 2011). Bookkeepers are also active as financial facilitators by, for instance, blending drug revenues with the company results of a café or garage company (Soudijn 2011).

A study by Van Duyne (2003) shows that, besides investments in real estate, criminals spend a lot of their money on cars. Car dealers, therefore, regularly turn out to function as financial facilitators, accepting criminal money and deliberately shielding the buyer or user of the car. Other entrepreneurs selling expensive goods, such as jewelers or watch dealers, can work in similar ways.

With the emergence of virtual assets (e.g., bitcoin), the FATF (2019) recognizes that these new technologies can create new opportunities for criminals to launder their proceeds. Therefore, Virtual Asset Service Providers (VASPs) – a range of crypto businesses, including exchange offices, ATM operators, wallet custodians, and hedge funds – are now subjected to the same type of guidelines as other

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<sup>4</sup> Underground banking in the West was originally used by particular immigrant groups, e.g., Afghans or Pakistanis, who wanted to send money to their family members in their country of origin. More recently, it also includes criminals among its clientele (Siegel & van de Bunt, 2014).

financial institutions (FATF 2019). That VASPs may act as financial facilitators can also derive from the fact that, in recent years, bitcoin exchangers more often emerge as financial facilitators in criminal investigations in the Netherlands and elsewhere (Soudijn 2018). These VASPs are willing to accept or pay out large amounts of cash to criminals, while charging them much higher transaction fees than their regular customers (Soudijn 2017).

### Professional money laundering networks

While the FATF (2018) suggests the existence of professional money laundering networks, the question arises of what kind of money launderers are working in these networks and what the advantages are for them to do so. A study by Van Gestel et al. (2008) into 12 criminal cases involving criminal offenses in the real estate sector shows that real estate traders,—agents, notaries public, and advisors working in the financial-administrative sector operate in small networks to optimize their fraudulent and money laundering activities. In a number of the cases studied, those involved not only tended to commit crimes for their own benefit but also performed a facilitating role for other illegal (drug) networks. They, for instance, acted as an illegal housing mediator supplying drug criminals with rental houses to live in. Or they acted as a financial intermediary in facilitating mortgage fraud, enabling criminals to buy a house with illegal revenues (Van Gestel et al. 2008). Given that ownership of real estate can often be concealed through the use of legal entities (Levi and Soudijn 2020), facilitators with knowledge of starting and managing companies or producing fake paper trails (e.g., lawyers, legal- or financial advisors, or accountants) may be regularly involved in money laundering through real estate and, to this end, collaborate with real estate traders, -agents, and public notaries. This proposition is partly supported by the study of Van Gestel et al. (2008), who found legal and administrative advisors to be part of the real estate networks. In eight out of the 12 cases under scrutiny, the main suspects and their co-suspects in or close to the center of the network were family members, but most of their other co-suspects they had met at their workplace or while doing business. This outcome illustrates how different sectors are intertwined and how these cross-sector criminal collaborations are formed.

In addition to real estate networks, it is known that underground bankers generally organize themselves in networks (Passas 1999). Collaboration with underground bankers in the same and other countries is essential for underground bankers to be able to execute their services. In the Netherlands, a large group of underground bankers is formed by Pakistani, Indian, and Afghan immigrants – also called Hawala bankers (Soudijn and Groen 2015). Traditionally, trust between underground bankers themselves and between underground bankers and their customers based on familial ties or shared local or regional heritage was deemed very important (Siegel and van de Bunt 2014). Still, a study into several Dutch cases involving Hawala bankers shows that there are often no strong ties between underground bankers and their customers (Van de Bunt 2008). A Pakistani banker, for instance, was found to offer his services to Turkish criminals,



while ethnic Dutch and British criminals used Hindi bankers to transfer their money (Soudijn and Akse 2012). Also, for connections between underground bankers themselves, the prevalence and importance of strong social ties should not be exaggerated (Thompson 2006). Thompson argues that underground banking is a business like any other, first and foremost driven by profit. Thus, if a banker has a different ethnicity or lacks a social or familial connection to the other banker, that will not withhold them from doing business if they are able to verify the trustworthiness of the other party. Thompson observed that – in Afghanistan – this is particularly the case in the trafficking of drugs. This observation seems to be supported by Passas (2005), who concludes that, in light of the globalizing economy and the significant amounts of money circulating worldwide, underground bankers must increasingly rely on people beyond kinship or ethnic ties. Given the substantial amounts of money involved in drug trafficking cases, underground bankers are tempted to go beyond strong social ties to do business.

### **Money launderers in police investigations**

Police investigations into organized crime typically focus on suspects involved in predicate crimes (e.g., drug trafficking and production). Therefore, money launderers involved in the transfer of illegal revenues into the legal economy often only appear in the periphery of criminal networks when analyses are based on such investigations – if they are investigated by the police at all. This finding is illustrated by the aforementioned study of Malm and Bichler (2013), who studied 129 Canadian crime groups using data from a Provincial Threat Assessment report. They find that professional money launderers hold more peripheral positions in the network than self-launderers, who are firstly involved in predicate crimes and subsequently launder their own illicit earnings. In other SNA studies on criminal networks, money launderers are either wholly absent from the analysis (e.g., Bright et al. 2012) or found mainly in the periphery of the network (e.g., Morselli and Giguere 2006).

As the focus of police investigations is typically on suspects involved in predicate crimes, money launderers tend to emerge as a stand-alone contact of the main suspect. Consequently, questions about money launderers' level of 'professionalism' or the extent of collaboration between professional money launderers cannot be answered. It is, therefore, essential to combine data from multiple police investigations over a longer period of time in order to answer our central research questions: to what extent do professional money launderers display business-like behavior, and to what extent are they connected?

### **Current study**

The current study focuses specifically on professional financial facilitators in the Netherlands. Professional financial facilitators offer their knowledge and opportunities for money laundering as a service, and a price founded on market-based



exchange (Kleemans et al. 2002; Soudijn 2017; Von Lampe 2016). Because of the focus on professional financial facilitators instead of on drug criminals and self-launderers, this study is able to 1) characterize professional financial facilitators and the extent to which their actions can be typified as business-like. Furthermore, this study focuses on 2) the collaboration between professional financial facilitators and examines whether professional money laundering networks exist.

Based on extant research, we expect that the way the population of professional financial facilitators operates can be characterized as highly ‘business-like’ (which refers to being active in multiple cases, having multiple (returning) criminal contacts, and an absence of familial relations (also see the method section)). Still, we expect to find variation between facilitators, with some being involved in a lot of cases, having many criminal contacts and many collaborations with other professional financial facilitators, while others are acting less business-like. The level of professionalism may also differ between expertise groups. We further hypothesize that professional financial facilitators collaborate with each other and form so-called professional money laundering networks.<sup>5</sup> Within these networks, we expect to find separate components mainly consisting of underground bankers, as well as components with a focus on real estate. Despite evidence of underground bankers increasingly doing business with parties to which they are unrelated, given the nature of their service, we still expect to find more familial relationships (both with other facilitators and criminal contacts) for underground bankers than for the other expertise groups. Finally, we expect that facilitators who collaborate with other professional financial facilitators tend to show more business-like behavior than those who are no part of a money laundering network. A facilitator’s position in the larger money laundering network may also be related to their level of business-like behavior, with those more central to the network showing higher levels of professionalism.

## Data, methods and limitations

### Sampling from police register data

Compared to earlier studies into financial facilitators, what makes this study unique is the large sample ( $N=198$ ) and the use of police register data. The sample consists of professional money launderers who provided services for drug criminals in at least one criminal case during the time period 2016–2020.<sup>6</sup> Sample selection was based on individuals being mentioned as money launderers or financial facilitators in the police registers. Police investigations often focus on drug criminals and/or cash money (Matanky-Becker and Cockbain 2021), while most cash money being laundered in the Netherlands comes from drug criminals. As a result, the money

<sup>5</sup> At the same time, however, we do expect to see facilitators who do not collaborate with other professional financial facilitators.

<sup>6</sup> The sampling method we applied can be described as ‘targeted extraction’ (see Campana and Varese 2022).

launderers that end up in police investigations and registers all mainly work for drug criminals. Information on the nature of the activities of criminals and their money launderers is used by the police to make a selection of those money launderers, typically the more professional ones.<sup>7</sup> Following this selection process which is inherent to the way police investigations into money laundering are executed, we drew our sample from the police registries based on the following criteria of professionalism. Firstly, we excluded money mules, strawmen, and self-launderers who laundered their own criminal (drug) proceeds. Instead, all money launderers in our sample are hired by others for their financial expertise and are themselves not involved in the predicate crime. Secondly, the number and the reputation of criminal contacts was a selection criterion. When money launderers have multiple criminal contacts or when they have contact with a high-rolling drug criminal, they are more likely to be a professional money launderer and were added to our sample. Thirdly, in a few cases, our selection was based on the total revenues, as money launderers are likely to be more professional when they have to launder higher amounts of illegal revenues.<sup>8</sup> Lastly if a case concerned a money launderer that facilitated consumption for a criminal (e.g., accepting criminal cash money for the purchase of a car), the case was only included if the money launderer, apart from accepting the cash as payment, also provided the criminal with a false paper trail to cover the criminal origin of the money.

The analyses were performed on a pseudonymized datafile containing the relationships of a sample of 198 professional financial facilitators,<sup>9</sup> of which 194 were a suspect in at least one case in the period 2016–2020.<sup>10</sup> For each of these facilitators' registrations in the police systems up to 15 years before the sampling case were also included. For every professional financial facilitator, the data contain information about the cases they are involved in, the contact registrations in these cases with criminal contacts and other professional financial facilitators, the nature of these relationships, and the facilitators' area of expertise. A total of 628 cases, 2,294 unique criminal contacts, and 3,547 unique relationships were included in the analyses. Someone is considered a contact of a facilitator, if there is a contact registration between them in at least one case. A contact registration is made by police when, for instance, observations or wiretapping show that people met or spoke to each other. Registered contacts between the facilitators and their criminal contacts and contacts between financial facilitators and other financial facilitators are considered as a proxy for criminal collaboration between these individuals. The criminal contacts are likely individuals who used the money laundering services of the

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<sup>7</sup> Furthermore, as only individuals with a direct connection to the Netherlands are of interest to the Dutch police, solely individuals who live or have lived in the Netherlands are investigated by the police and are part of the sample. Networks that may be visible in this data are, therefore, active in and focused on the Netherlands.

<sup>8</sup> This criterion was only used in a few cases where a good indication of the total revenues was available. In these cases, the suspected money launderers were all entrepreneurs.

<sup>9</sup> As we made clear what we consider as 'professional' and as we excluded self-launderers, in the remaining part of the article, we prefer to use the term professional financial facilitators over professional money launderers as the term makes it clearer that these individuals are offering an essential service.

<sup>10</sup> Four professional financial facilitators are not suspected in any case but do have contact with another professional financial facilitator in at least one case and are considered financial facilitators by the police.

facilitators, yet based on the police registrations, we cannot be entirely certain that they are convicted criminals who were indeed the facilitator's customers. Besides, the criminal contacts can also be money mules or strawmen with whom a facilitator had a criminal collaboration. Financial facilitators form their own category and are, thus, not part of the criminal contacts category.

The presence of criminal contacts in the data is, moreover, more contingent on the focus of the police investigation than the presence of professional financial facilitators and should, therefore, be considered as a lower limit. In some cases, the investigative focus was on the facilitators, which resulted in fewer criminal contacts being investigated. Other investigations were relatively short, and not all criminal contacts were investigated because of time and budget constraints. Underground bankers, for instance, typically service multiple customers, but the police files often include only a fraction of them. On the other hand, some investigations focus on drug criminals, resulting in many registered criminal contacts for the financial facilitators that are identified in these cases in due course. We are aware that it remains a question of how accurate the police registrations are and how closely they reflect reality. If, for instance, one financial facilitator tends to behave less business-like than the other – based on the available data – this might reflect reality. At the same time, it might also be possible that this particular facilitator fell through the proverbial police cracks because of less rigorous registration discipline.

At first, 28 different kinds of expertise of the facilitators were differentiated based on the police registrations. Eventually, these categories were brought down to a total of 7 different expertise groups to enhance the interpretability of the results. The same was done for the nature of the relationships, which started with over a hundred variations – including obscure descriptions like ‘concubine’ – and was reduced to 8 categories.

The distribution of professional financial facilitators over the different expertise groups is shown in Fig. 1. The largest group in Fig. 1 clearly involves underground bankers (74), followed by the groups ‘financial advice’ (39) and ‘real estate’ (33), which are also quite substantial in size. The category ‘underground banking’ includes underground bankers as well as individuals working for money transfer organizations (MTOs) and one bank employee who offered underground banking services from that position. The category ‘financial advice’ includes advisors from the financial-administrative sector, bookkeepers, accountants, and (ex-)lawyers. The expertise category ‘real estate’ includes – among others – real estate traders, -agents, and rental agents. The category ‘entrepreneurs’ includes facilitators who run small to medium-sized businesses and who not only accept cash from criminals but also play an active role in setting up smokescreens for their customers and laundering their criminal money flows. The category ‘notaries public’ refers to the expertise offered by this group and includes not only notaries public but also ex- and candidate notaries public. The category ‘legal entities’ consists of facilitators who set up and use legal entities for money laundering purposes.<sup>11</sup> The final category, ‘VASP’ includes facilitators operating as Virtual Asset Service Providers.<sup>12</sup>

<sup>11</sup> This also includes two facilitators operating as trust office service providers.

<sup>12</sup> This was explained in the subparagraph Professional money laundering in practice.

The categories created to describe the nature of the relationship between the facilitators, their clients, and other professional financial facilitators are: family, social, business, financial, criminal, intimate, statement about,<sup>13</sup> and contact. Not all categories are, however, very informative, and 50.7 percent of the relationships in our data is not further specified by the police and registered merely as ‘contact’.<sup>14</sup>

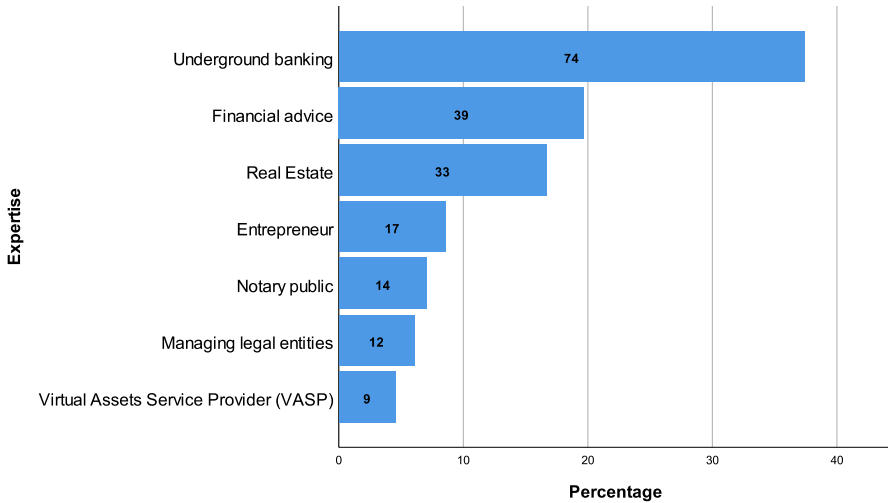
## Methods

The police registries used for this study are not primarily designed for scientific research. Issues of validity and reliability of police register data have, therefore, been raised by several authors, especially in an SNA context. The number of financial facilitators present in the data can, for instance, be influenced by levels of enforcement, changing policy directions, and resource restraints (Campana and Varese 2022). In addition, Soudijn (2014) shows that the presence of financial facilitators in police investigations is also dependent on whether a financial focus was applied at the start of the investigation. Rostami and Mondani (2015) show that the type of data (e.g., intelligence or co-offending data) also influences the results of social network analyses. They conclude that different datasets can produce fundamentally different pictures of the same phenomenon. Thus, both the type of data and the quality of police register data are known to influence the outcomes of social network analyses (Bouchard 2020; Campana and Varese 2022; Diviák 2019).

Despite these important concerns, SNA, based on police register data, is still a very informative method that can provide new insights into the study of illicit networks in general and money laundering networks in particular. In the current study, SNA will be used to map potentially existing networks of professional financial facilitators and examine their different components. Furthermore, network statistics, such as degree- and betweenness centralization, will be used to describe the whole network, while individual network statistics, such as degree- and betweenness centrality and ego network heterogeneity, will be used to assess the positional importance of individual facilitators in the network and to test whether network position is related to individual-level indicators of business-like behavior. To test the latter, we perform a multiple linear regression using the Clustered Standard Errors (CSE) method suited for clustered network data. In our network data, the model errors of individuals in the same cluster are possibly correlated, while it is assumed that the model errors of individuals in different clusters are not. The CSE method controls for within-cluster correlation, thereby preventing the occurrence of misleading small standard errors and consecutively misleading small confidence intervals, large *t*-statistics, and low *p*-values (Cameron and Miller 2015). The SNA is performed in R (version 4.1.1) and UCINET. Furthermore, we analyze the indicators of business-like behavior and test for differences between facilitators. These analyses are performed in IBM SPSS statistics (version 25).

<sup>13</sup> This category includes relationships that are considered present by the police after at least one of the two involved included the other person in their official statement.

<sup>14</sup> Bright et al. (2015) used files from the public prosecutor for their study into drug trading networks and encountered the same problem. In 69 percent of the cases in their study, the relationship type was unknown.



**Fig. 1** Distribution of professional financial facilitators over the expertise groups (absolute numbers shown in bar) ( $N=198$ )

### Indicators of business-like behavior

The term ‘business-like’ is characterized in regular definitions by regularity, efficiency, professionalism, and the focus on profit-making (see, e.g., Dart 2004). Not all of these aspects, however, can be covered with the data available for this study as, for instance, information on the complexity of money laundering schemes or the height of the fees received – the amount of money the professional financial facilitators ask and receive for their services – is lacking. Indicators of business-like behavior, therefore, had to be based on the available information on professional financial facilitators and their contacts. Earlier, we mentioned that behavior we consider as business-like includes involvement in multiple cases, the number of (returning) criminal contacts, and the absence of familial relationships. Next to self-launderers Malm and Bichler (2013) distinguish professional money launderers and opportunistic money launderers, who only occasionally launder money for individuals with whom they have a kinship or social tie. According to Malm and Bichler (2013), therefore, regularity – a characteristic of the term business-like – discriminates professional from opportunistic launderers. Although regularity is not part of our formal definition of professional financial facilitators, we consider it an important indicator of business-like behavior if facilitators are active in multiple cases. In addition, if professional financial facilitators have contact with multiple criminals, this is also viewed as an indicator of business-like behavior, as it suggests the facilitator is working for various criminals or criminal groups. At the same time, business-like behavior can be deduced from the number of returning criminal contacts, as

returning contacts suggest a more than an occasional relationship between the parties. The absence of familial relationships suggests a professional relationship instead of a more personal or emotional relationship between the parties. Professionalism is regularly part of the definition of business-like and, therefore, the absence of familial relationships is in the current study considered as an indicator of business-like behavior.

## Results

### Indicators of business-like behavior

To characterize professional financial facilitators and the extent to which their actions can be typified as business-like, we analyzed the number of cases they are involved in, their number of (returning) criminal contacts, and their percentage of familial contacts (see Table 1). The professional financial facilitators in our sample are suspected in 5.3 cases on average, with a large majority (82.0%) being suspected in more than one case. The facilitators have, on average, 13.8 different criminal contacts, and 40.0 percent have more than 10 criminal contacts. The number of cases in which a facilitator and a criminal contact collaborate ranges from 1 to 12, while in 81.1 percent of the cases, a facilitator and a criminal contact work together in only one case. For the 105 facilitators who have at least one returning criminal contact, the average amount of returning criminal contacts is 4.6. Of these 105 facilitators, a majority of 71.4 percent have more than one returning criminal contact. On average, around one-fourth of facilitators' contacts are family members. There is a significant moderate-size negative correlation between the number of different contacts a facilitator has and his percentage of familial contacts ( $r = -0.350$ ,  $p < 0.001$ ), which means that if a facilitator has more registered contacts, his percentage of family members among those contacts is lower.

As can be derived from Table 1, there are large differences between financial facilitators. Some are suspected in only one case and only have a few criminal contacts, while others are involved in over 30 cases and have dozens of criminal contacts.

### Collaborating versus non-collaborating financial facilitators

In terms of their business-like behavior, we compared the professional financial facilitators who collaborate with a least one other financial facilitator to the facilitators who do not collaborate with other financial facilitators, as we expected collaborating facilitators to behave more business-like. We found that, on average, collaborating facilitators ( $\bar{x} = 6.36$ ) are indeed involved in significantly more cases than are non-collaborating facilitators ( $\bar{x} = 3.85$ ) ( $t(189.672) = -3.525$ ,  $p < 0.01$ ), that collaborators ( $\bar{x} = 15.84$ ) have significantly more criminal contacts than

**Table 1** Indicators of business-like behavior

Description	Number of cases		Number of criminal contacts		Number of returning criminal contacts		Percentage of familial contacts
	The number of cases a PFF is involved in as suspect		The number of criminal contacts per PFF		The number of returning criminal contacts per PFF		The percentage of familial contacts per PFF
N	194		185 (9 PFFs only have contact with other PFFs)		105 (89 PFFs have no returning criminal contacts)		194
Average	5.31		13.82		4.6		24.5%
Range	1–35		1–126		1–48		0–100%
Mode	1		2		1		0%



non-collaborators ( $\bar{x}=9.44$ ) ( $t(176,852)=-2.735$ ,  $p<0.01$ ), and that collaborating facilitators ( $\bar{x}=3.12$ ) have significantly more returning criminal contacts than non-collaborating facilitators ( $\bar{x}=1.63$ ) ( $t(170,186)=-2.262$ ,  $p<0.05$ ). Professional financial facilitators who collaborate with other professional financial facilitators, therefore, behave more business-like, than those who do not collaborate with other facilitators.<sup>15</sup> We also expected collaborating facilitators to have a lower percentage of familial contacts; however, we did not find a significant difference between the two groups in this regard.

### **Familial relationships: Underground bankers versus other financial facilitators**

Based on the literature, we also expected to see a difference in the number of familial contacts between underground bankers on the one hand and the other financial facilitators on the other hand. Our results show that there is a weak positive relationship ( $\Phi=0.193$ ) between the expertise group (underground banker or not) and familial relationships ( $X^2(1)=131.603$ ,  $p<0.001$ ). Of the underground bankers' registered relationships, 39.5% concern a familial relationship, while 20.5% of the other facilitators' relationships concern a familial relationship. The above finding concerns all registered relationships of a facilitator (with other financial facilitators and with criminal contacts). Still, the finding also holds when the two types of relationships are analyzed separately. This implication means that we find the same relationship between expertise group and familial contacts when only the relationships with criminal contacts are examined ( $\Phi=0.179$ ) and when only relationships with other financial facilitators are examined ( $\Phi=0.343$ ).

### **Money laundering networks**

To study whether money laundering networks in the Netherlands exist, we analyzed the available police register data in such a way that a collaborative relationship between professional financial facilitators was assumed when they had a contact registration in at least one case. The resulting network is an undirected network, which means that it is known that two facilitators have had contact with each other. Still, it is unknown who is the initiator or receiver. The results are shown in Table 2 and Fig. 2.

The results show that 117 of the 198 professional financial facilitators (59.1%), have at least one registered contact with at least one other financial facilitator and, thus, are part of the money laundering network. Of these 117 facilitators, 65 can be directly or indirectly connected to each other and form a giant component, while the network as a whole consists of a total of 22 components. The number of facilitators with whom a facilitator has had contact ranges from 1 to 9 (degree centrality),

<sup>15</sup> These findings were robust when outliers weren't included in the analyses. There were 3 outliers in the analyses about cases and criminal contacts and 2 outliers in the analysis about returning criminal contacts.

with an average degree of 1.95. For most facilitators, the number of contacts with other facilitators is, nonetheless, limited: a majority (53.6%) of the facilitators in the network have had contact with only one other facilitator, and only 7 facilitators have had contact with 5 or more other facilitators. The limited variation in connections between facilitators leads to an evenly distributed network with a low degree centralization.

If smaller components are left out of the analysis and network measures are solely calculated for the giant component, degree centralization increases because a network with one component is more centralized than a network with multiple components. In addition, betweenness centralization steeply increases because there is more variation in the betweenness centrality scores.<sup>16</sup> The average degree for the giant component is also higher than in the overall network, because the facilitators in the giant component are the ones with the most connections.

Most facilitators have had contact with each other in only one case (61.4% of all the relationships). However, 50.4% of the facilitators in the network have at least one connection to another facilitator with whom they have a registered contact in more than one case. In 72.8% of these cases, this concerns a repeated collaboration with just one facilitator, but there are also two facilitators who repeatedly collaborated with four different facilitators. The number of cases in which facilitators had contact with each other ranges from 1 to 8. In Fig. 2, the width of an edge reflects the number of cases in which facilitators had contact with each other (thicker means contact in more cases).

In Fig. 2, facilitators have different colors based on their expertise group. The figure shows that most facilitators in the network are underground bankers who mainly collaborate with each other. Furthermore, there are connections between facilitators from the financial advice group and the real estate group, especially at the bottom of the giant component, where a network community can be discerned that is largely focused on the real estate sector. On the right side of the figure, it is clearly shown that Virtual Assets Service Providers (VASP) only collaborate within their own group.

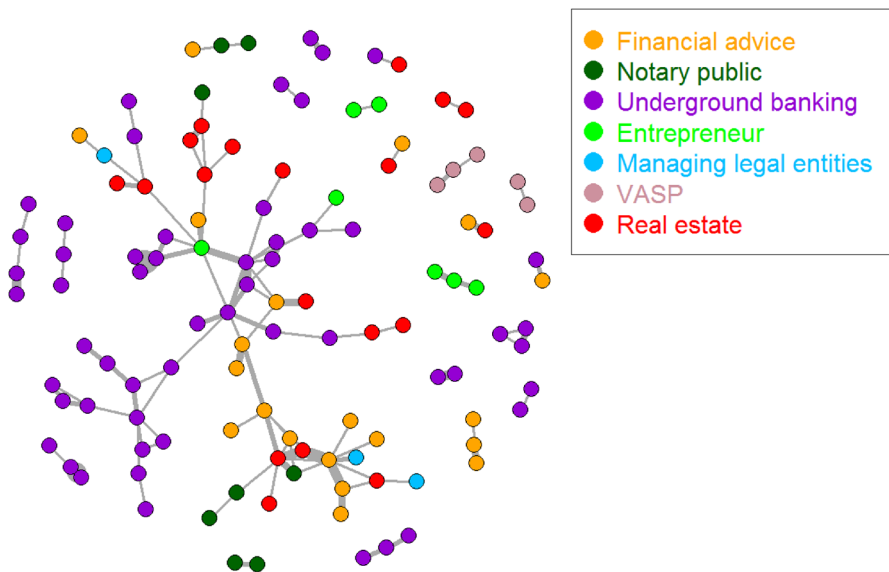
### Central actors in the money laundering network

Using centrality measures, we examined who are the most important actors in the money laundering network. On the one hand, we did this using degree centrality, which measures the number of facilitators a facilitator is directly connected to and reflects how easily information can reach a facilitator. On the other hand, we used betweenness centrality, which measures the proportion of geodesics (the shortest path between nodes) between pairs of other nodes that include this node. Betweenness centrality, therefore, reflects the amount of influence a facilitator has over the flow of information in a network. Facilitators with higher betweenness centrality

<sup>16</sup> In the network with 22 components, a large number of facilitators have a betweenness centrality of 0. In the giant component some facilitators have a betweenness centrality of 0, and others have relatively higher scores, therefore making the variation in the giant component bigger.

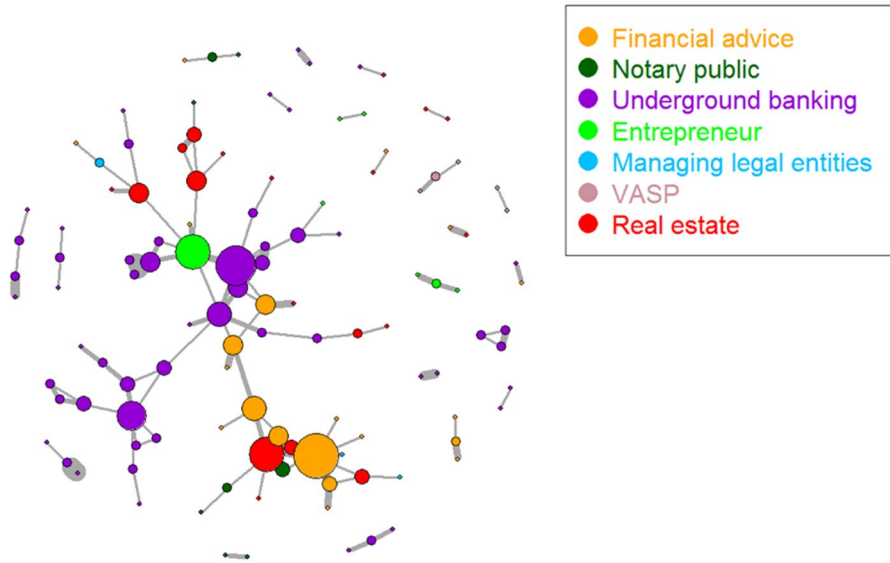
**Table 2** Description of the social network of professional financial facilitators based on police registrations

	Network based on contact registrations	Giant component
Type of network	1-mode	1-mode
Nodes	117	65
Edges	114	82
Components	22	–
Size of giant component	55.6%	–
Degree centrality (range)	1–9	1–9
Average degree	1.95	2.52
Standard deviation	1.52	1.82
Degree centralization	0.0618	0.1044
Betweenness centrality (range)	0–0.18	0–0.18
Average betweenness	0.01	0.08
Standard deviation	0.03	0.14
Betweenness centralization	0.1461	0.4553
Density	0.0168	0.0394

**Fig. 2** Money laundering network based on contact registrations ( $N=117$ )

form a bridge between different parts of the network. These individuals have crucial positions in the network and are generally called brokers (Bright et al. 2017).

Based on degree centrality, some facilitators stand out, as they have relatively many connections to other facilitators (see Fig. 3). The facilitators with the highest



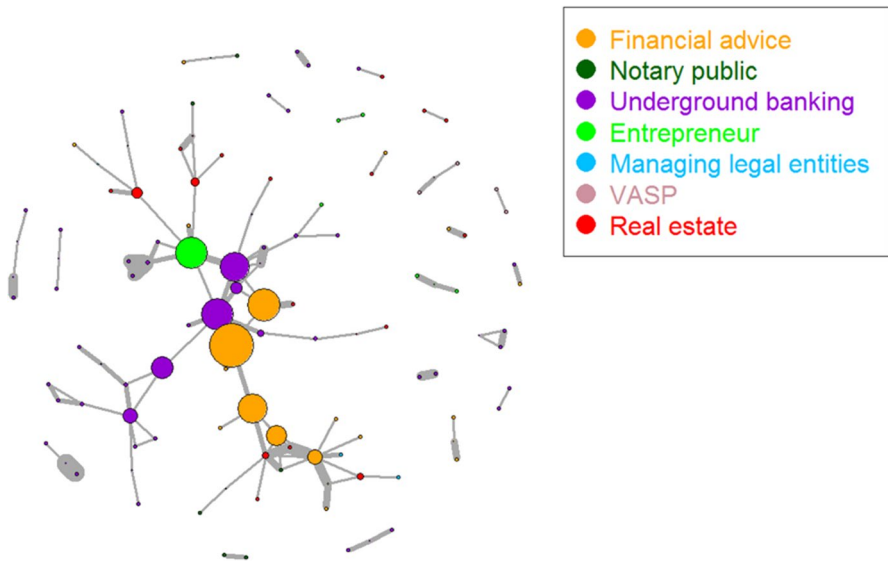
**Fig. 3** Money laundering network based on contact registrations ( $N=117$ ), node size based on degree centrality

degree centrality are several underground bankers, facilitators from the financial advice- and real estate group, and an entrepreneur (car dealer).

The image shifts a bit when looking at betweenness centrality (see Fig. 4). On the one hand, the most important brokers in the network also have relatively high degree centralities. On the other hand, not all facilitators with high degree centrality are important brokers. The most important brokers in the network are facilitators from the financial advice group, several underground bankers, and an entrepreneur (car dealer). Brokerage can be found between parts of the network that are focused on real estate and parts that are focused on underground banking or consumption (cars). Brokerage can also be found between network communities with the same focus, thereby creating larger networks of either underground banking or real estate. In the real estate focused network communities, we find that facilitators from the real estate as well as the financial advice group have high degree centralities but only facilitators from the latter group perform the role of broker. Furthermore, it seems like some of these facilitators are involved in different types of money laundering schemes, either simultaneously for the same criminal contact or consecutively, for instance, facilitating real estate investments for the one criminal contact and facilitating money laundering through underground bankers for the other.

### Network position and business-like behavior

To analyze the relationship between network position and business-like behavior, we first performed a principal component analysis to test whether the four indicators of



**Fig. 4** Money laundering network based on contact registrations ( $N=117$ ), node size based on betweenness centrality

business-like behavior (number of cases, number of (returning) criminal contacts, and absence of familial relationships) could be captured in one component. Eventually, one component was constructed without the variable ‘familial relationships’, which had a communality of only 0.024 if it was included. The constructed component had an eigenvalue higher than Kaiser’s criterium of 1 and could explain 89.0% of the variance. The resulting component is taken to represent ‘business-like behavior’.

The business-like behavior component was subsequently used as a dependent variable to perform a regression analysis testing whether individual network measures can predict levels of business-like behavior. Betweenness centrality and ego network heterogeneity were used as predictors.<sup>17</sup> In our analysis, ego network heterogeneity measures the variety of expertise groups in the ego network of a facilitator. This ego network heterogeneity was calculated using Blau’s measure of heterogeneity (see Sampson 1984).<sup>18</sup> A facilitator’s ego network heterogeneity is higher when he collaborates with facilitators who belong to varying expertise groups.<sup>19</sup> We used the Clustered Standard Errors method to control for the effects of clustering in the network data. The number of clusters used for the analysis was 22, which is equivalent to the 22 components of the network.

<sup>17</sup> Degree centrality was eventually not used as predictor in the model because of its high correlation with betweenness centrality ( $r=.739$ ,  $p<.01$ ). We chose to include betweenness centrality as it is conceptually more interesting than degree centrality as it defines which facilitators hold the key positions in the network instead of just giving the number of facilitators a facilitator is connected to.

<sup>18</sup> Blau’s measure of heterogeneity is a common measure of diversity and is calculated as  $1 - \sum p_i^2$ , where  $p_i$  is the proportion of particular groups or categories in one’s network (Lee et al. 2021).

<sup>19</sup> If a facilitator collaborates with just one other facilitator ego network heterogeneity is always 0, because there is no variety possible in that situation.

For both – betweenness centrality ( $B = 2.96$ ,  $p < 0.01$ ) and ego network heterogeneity ( $B = 2.18$ ,  $p < 0.001$ ) – we found a significant relationship with business-like behavior ( $F(2, 21) = 14.09$ ,  $p < 0.001$ ,  $R^2 = 0.1645$ ). This finding means that facilitators with more central positions in the network (higher betweenness centrality) tend to score higher on business-like behavior. In addition, business-like behavior also tends to be higher when a facilitator collaborates with facilitators from varying expertise groups (i.e., higher ego network heterogeneity).<sup>20,21</sup>

## Discussion

This study provides insight into the way professional financial facilitators in the Netherlands organize their business. The study, first of all, shows that professional money laundering networks in the Netherlands do exist. Using contact registrations made by the police, 117 of the 198 studied professional financial facilitators could be linked in – at times—extensive networks of collaboration. Based on the facilitators' area of expertise, roughly two main types of professional money laundering networks can be discerned. Some subnetworks operate in the real estate sector, while others primarily engage in underground banking.

The existence of especially these kinds of networks is perhaps not surprising. It is well known that criminals willingly invest their illegal profits in real estate (Soudijn 2018; Unger and Ferwerda 2011; Van Duyn 2003), firstly, because real estate can be used to live in or to house a legal or illegal enterprise. Secondly, for criminals – not only those in the Netherlands but also those in other countries – real estate is especially interesting given the high value of assets, their substantial price fluctuations, and the high levels of speculation within the market that make it difficult to assess the true value of properties. These characteristics make the real estate sector vulnerable to money laundering practices (Malm and Bichler 2013; Unger and Ferwerda 2011). Besides, it is beneficial to criminals that ownership of properties can be hidden in numerous ways (Unger and Ferwerda 2011).

The fact that real estate investments are often concealed through the use of legal entities (Levi and Soudijn 2020) suggests that facilitators with knowledge

<sup>20</sup> This analysis was performed with the function 'lm\_robust' from the R-package 'estimatr'. By setting the standard error type in this analysis to 'stata', the function uses the same variance estimator as comparable functions from, for instance, R-packages 'sandwich' and 'lmtest' and Stata. Compared to the regular linear regression analysis that we performed, the analysis using the Clustered Standard Errors (CSE) method returns lower standard errors, higher t-values and lower p-values. While in the first analysis only ego network heterogeneity seemed to be a significant predictor ( $p < .001$ ), using the CSE-method returned both predictors to have a significant relationship with business-like behavior. However, it needs to be considered that the results of the analysis with the CSE-method are not entirely robust. When the analysis is performed using the standard error type of the 'lm\_robust' function, which uses a different variance estimator, both betweenness centrality and egonetwork heterogeneity are no longer significantly related to business-like behavior.

<sup>21</sup> Degree centrality strongly influences egonetwork heterogeneity, because a degree centrality of 1 always leads to a minimum score of 0 on egonetwork heterogeneity. To test whether the effect of egonetwork heterogeneity was not just caused by a facilitators' degree centrality, we also ran a model including degree centrality as a control variable. In that model, the effect of egonetwork heterogeneity remained significant, illustrating that it still predicts business-like behavior next to the effect of degree centrality.

of starting and managing companies or producing fake paper trails (e.g., lawyers, legal- or financial advisors, or accountants) are regularly involved in money laundering through real estate and, therefore, are expected to collaborate with real estate traders, -agents, and public notaries. This proposition was partly supported by the study of Van Gestel et al. (2008), who found legal- and administrative advisors in real estate networks. Our study also confirms this hypothesis and shows that these groups of facilitators collaborate in network communities that launder criminal proceeds through real estate.

Our finding of networks composed of underground bankers also has a clear enation. Underground banking is attractive to criminals because of its unofficial character, anonymity and efficiency, and the possibility of disbursing large sums of money in a different country on a regular basis (Kruisbergen et al. 2012). Collaboration between underground bankers is key to the underground banking system, and from literature it can be derived that hawala bankers often collaborate with family members in this respect (Passas 1999). Our current analysis shows that underground bankers do, indeed, more often than other financial facilitators, collaborate with family members in their relationships with criminal contacts and other financial facilitators. However, our analysis also shows that the majority of their contacts are not family members, which is in line with the findings of van de Bunt (2008) that underground bankers do not necessarily have strong social ties to all of their customers.

Two smaller components in the network that we studied consist of Virtual Assets Service Providers (VASPs). As these VASPs, e.g., bitcoin exchangers, begin to emerge as financial facilitators in criminal investigations in the Netherlands more often, extra research attention to this group may be justified. Our study shows that if these facilitators collaborate with other financial facilitators, they only collaborate within their own expertise group and don't seek collaboration with facilitators that do not focus on virtual assets. Whether this finding results from VASPs being a relatively new phenomenon, either to other types of money launderers or to the police, resulting in fewer collaborations or fewer registered collaborations, respectively, at this point remains a question to be answered by future research.

As this study finds that most professional financial facilitators in the Netherlands collaborate with other financial facilitators, we might assume that collaboration with other money launderers in carrying out their money laundering activities, is beneficial and perhaps even necessary. Tenti and Morselli (2014) describe organized crime as a matter of criminal opportunity and necessary collaboration, a statement that looking at our results, also applies to the illegal market of money laundering in which the professional financial facilitators offer their services and need to find suitable partners for collaboration. Our results also show that when a suitable partner for collaboration has been found, this becomes a repeated partnership in almost 40 percent of all registered relationships, and implies stable relationships between many financial facilitators, and shows resemblance with regular market-based partnerships. While Malm and Bichler (2013) see professional money launderers mainly in the periphery of larger networks involved with predicate crimes, Giménez-Salinas Framis (2014) finds money launderers in the periphery of a larger drug network, yet also shows that in the case under scrutiny the larger money laundering network



operated beyond those money launderers that stood in direct contact with the drug criminals. We have made these kinds of money laundering networks more visible with the current study. The fact that professional money launderers in individual police investigations often appear in the periphery of larger (drug) networks might therefore be misleading and ill-represent professional money launderers' role and importance in both the initial network and in the larger money laundering network. Consequently, it is essential that police investigations pay more attention to the financial aspects of predicate and organized crimes and focus more specifically on money launderers and money laundering networks.

Individual-level centrality measures show which facilitators have the most central positions in the overall network; based on degree centrality, some facilitators appear prominent because they have contact with many other facilitators, and at the same time, other facilitators only have contact with one or two others. Based on betweenness centrality, fewer facilitators stand out.<sup>22</sup> There appear to be only a few facilitators who can justifiably be called 'brokers' because they connect different parts of the network, otherwise separated. These brokers score high on both betweenness and degree centrality. In the real estate focused network communities, we find that facilitators from the real estate and the financial advice group have high degree centralities, but only the facilitators from the latter group that act as brokers. The brokers connect network communities focused on real estate, underground banking, and luxury consumption (cars), and network communities with the same focus, thereby creating larger underground banking or real estate communities. We find facilitators from the financial advice group to often perform the role of the broker. This group may have unique financial and administrative knowledge beneficial to all kinds of money laundering, whether it relates to real estate transactions, underground banking, or luxury consumption.

From the current analysis, the question arises what drives brokerage between communities in the network with different areas of expertise. While Van Gestel et al. (2008) found only one person who was active in a real estate network and who simultaneously actively participated in underground banking in another criminal network, we found multiple facilitators connecting these assumedly separate worlds. Underground banking and real estate might be connected as criminal proceeds are not always in the right location or available in the desired currency. As a result, it might be necessary to exchange the money or move it to another country – actions that can be performed by underground bankers – in order to enable investments in criminals' countries of origin or the countries they otherwise prefer to build up a life. Teichmann and Falker (2021) showed that money exchange can be used to introduce criminal proceeds into a country's financial system or that it precedes that stage, which can pave the way for investments in the legal economy, including real estate. Passas (1999) also found that underground banking sometimes precedes real estate transactions, and taken together, underground banking might sometimes be beneficiary for performing real estate transactions and shows that money laundering typologies that often differentiate between

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<sup>22</sup> This might, therefore, be a better measure than degree centrality to identify the key players in the network.

cash-based money laundering on the one hand and the creation of false paper trails for investments in the legal economy (e.g., in real estate) on the other hand can, in practice, be closely related (Soudijn 2018). However, it is unclear, as of yet, whether the financial facilitators that connect communities with different areas of expertise are also the ones who set up large schemes for one drug criminal, including real estate investments, underground banking, and consumption, or that they focus on a single type of money laundering for different criminal customers in sequence. Future research, including, for instance, the study of case files, is needed to describe these kinds of cross-expertise collaborations in more detail.

Furthermore, our analysis shows that higher levels of business-like behavior generally characterize facilitators who operate in networks. They are involved in more cases than facilitators that operate individually, and they have more criminal contacts and more returning criminal contacts. In addition, we found facilitators' network position to be related to their level of business-like behavior. Those with more central positions in the network (higher betweenness centrality) tend to show more business-like behavior. Facilitators also tend to show more business-like behavior when collaborating with facilitators from varying expertise groups (i.e., higher ego network heterogeneity). To the extent that collaboration with varying expertise groups can be viewed as task differentiation, ego network heterogeneity itself may be considered an element of business-like behavior.

The current study also has some limitations that need to be mentioned. One of the assumptions underlying this study is that registered contacts with other criminals indicate collaboration, in that sense that facilitators launder illegal revenues for their criminal contacts in each case. Similarly, the contact registrations between financial facilitators are interpreted as indicative of some form of collaboration between these two (or more) facilitators. While this assumption seems justified concerning the nature of the data and the goal of the underlying criminal investigations, it is strictly the existence of contact that is registered and not the nature of that particular contact, and this is also the reason that the current study cannot provide any additional information on the background and nature of the collaborations between financial facilitators derived from the contact data. Therefore, questions remain, like precisely what services are professional financial facilitators offering to each other, and how does this contribute to the concealment of criminal proceeds? For more information on the nature and role of possible collaborations between different financial facilitators in money laundering schemes, a more detailed analysis of the underlying case files is needed, which will be our focus in follow-up research.

A second limitation is that the analyzed networks depend fully on police registrations. The criminals with whom the financial facilitators have contact registrations are mainly involved in drug offenses. The results, therefore, show that networks of professional financial facilitators laundering drug money are active in the Netherlands. It is possible that, for instance, fraudsters use other types of professional money laundering networks to handle their criminal proceeds. Follow-up research using data on, for example, cyber- and fraud networks, gathered through different sampling frames or from dedicated law enforcement agencies, like the Fiscal Information and Investigation Service (FIOD), would strengthen the validity of the current findings if they were to show that money laundering networks in the Netherlands operate in a wider field,

laundering all kinds of illicit money. Furthermore, it is also possible – if not likely – that there are facilitators who operate so covertly that the police hardly notice them. More generally, it is questionable whether police registrations ever show the full picture (Campana and Varese 2022). A suspected drug criminal might have had contact with a financial facilitator. Suppose the police investigation only focuses on the drugs and not on the money; there is a risk that such contacts are not registered as relevant, and this means that the professional money laundering networks in the Netherlands are potentially more business-like than this study can demonstrate.

A third limitation concerns the cross-sectional nature of the data. The police registrations that we used to construct the sample covers the period 2016–2020, and the criminal histories of the included financial facilitators span up to 15 years before that period. Collapsing data over such a long time span, creating an aggregated network, might lead to inaccuracies (Campana and Varese 2022; Faust and Tita 2019). As our data doesn't include the dates of the registrations, it is not possible to tell whether the collaboration network was at some point in time really as big as is shown in the analysis or that some collaborations in the network were only short-lived and have already ended for years. To get a clearer picture of the way money laundering networks are formed and continue to function over a longer period, longitudinal SNA might prove to be very informative. Further analysis of case files and interviews with investigators can also be of great value in the study of the development of these networks and these two types of analyses will, therefore, be part of our follow-up research.

Despite these limitations, the current study clearly shows that money laundering networks in the Netherlands exist. Professional financial facilitators, especially those who collaborate with other professional financial facilitators and hold more strategic positions in the collaboration network, offer their money laundering services to drug criminals in a highly business-like manner. That drug criminals are using these services shows that professional financial facilitators play an essential role in the fulfillment of the crime script and might, therefore, be potentially important actors for intervention. The current study hence signals the importance of increasing attention to money laundering in police investigations into drug offenses, all the more because some professional financial facilitators appear to be active in multiple cases. In the fight against organized crime, financial investigations and the police capacity to carry out these investigations are, therefore, indispensable.

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**Data availability** The datasets generated during and/or analysed during the current study are not publicly available due to its sensitive nature. Reasonable request can be made to the Dutch National Police. Once they grant permission, the datasets could be made available from the corresponding author.

## Declarations

**Disclosure of potential conflicts of interest** There are no potential conflicts of interest in this study.

**Ethics statement** Approval was obtained by the Dutch National Police. This retrospective study complied with national ethical guidelines and legal requirements.

**Informed consent** This study did not make use of human participants, therefore, no informed consent was obtained.

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