The Multidisciplinary Economics of Money Laundering

Joras Ferwerda

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De multidisciplinaire economie van het witwassen van geld

(met een samenvatting in the Nederlands)

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Joras Ferwerda

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approachable and relaxed at all times. I admire his work, his sharp analyses, his inspiring lectures and his positive working spirit. Moreover, I see him as the best example of a successful multidisciplinary economist.

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Since I am not exactly the romantic type, this paragraph for my girlfriend Jose Haasakker will not be 'a love song like the way it's meant to be' (Bon Jovi – Always), but

just a simple thanks for being there for me and for keeping my feet on the ground. As you will find out in this dissertation, I don't care about the constants in my regression models, but I do care a lot about the constants in my life: my girlfriend, my mom, my dad and my sister. I am probably the curious scientist I am today because of my nurture; mainly my father's never-ending search for more knowledge is an inspiration to me.

Contents

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List of Abbreviations

AIC	Akaike's Information Criterion
AML	Anti-Money Laundering
BS	Bank Secrecy
CDD	Customer Due Diligence
CF	Conflict
CPD	Cultural and Physical Distance
CR	Corruption
CTF	Counter Terrorist Financing
CTR	Cash Transaction Report
D	Distance
DG	Directorate General
DNFBP	Designated Non-Financial Businesses and Professions
EC	European Commission
EU	European Union
EX	Exports
F	Flow of money laundering
FATF	Financial Action Task Force
FC	Fully Compliant
FDI	Foreign Direct Investment
FEC	Dutch Financial Expertise Centre
FIOD	Dutch Financial Intelligence and investigation Unit
FI	Financial Institutions
FIU	Financial Intelligence Unit
GA	Government Attitude
GDP	Gross Domestic Product
GNP	Gross National Product
ICVS	International Crime Victims Survey
IM	Imports
IMF	International Monetary Fund
LC	Largely Compliant
ML	Money Laundering
MLA	Mutual Legal Assistance
N	Population
NC	Not Compliant
NCCT	Non-Cooperative Countries and Territories
NGO	Non-Governmental Organization
NLS	Non-linear Least Squares
OECD	Organisation for Economic Co-operation and Development
OEX	Overvalued Exports
OIM	Overvalued Imports
OLS	Ordinary Least Squares
P	Preference relation
PC	Partly Compliant
POCA	Proceeds Of Crime Act
RE	Random-Effects model

SAR	Suspicious Activity Report
STR	Suspicious Transaction Report
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TBML	Trade-Based Money Laundering
UEX	Undervalued Exports
UIM	Undervalued Imports
UK	United Kingdom
UN	United Nations
US	United States
UTR	Unusual Transaction Report
WODC	Dutch Scientific Research Documentation Centre
Y	GDP

Chapter 1. Introduction

"Science is being confused at a higher level; you certainly are."

– Victor van Kommer to Joras Ferwerda

I have come to a point in my career where I am sometimes introduced as an expert on money laundering. This still feels alien to me. With this dissertation, I tried to answer many questions about money laundering, but during my research I stumbled upon more questions than I was able to answer. This gives the contradicting feeling that the more you research, the less you know. This must be the reason why I am still uncomfortable with being called an expert. I therefore think that Victor van Kommer put it well when he told me that I am simply confused at a higher level, which is exactly what science is about.

1.1. The Multidisciplinary Economics of Money Laundering

The title of my dissertation is 'The Multidisciplinary Economics of Money Laundering'. This title brings together the two big influences on my work: my education and the existing literature. The Utrecht University School of Economics focuses on teaching multidisciplinary economics; combining the power of economics with other disciplines, like law, social science, history and geography to tackle economic issues. Diverse minds such as Jospeh Schumpeter and Thomas Kuhn convincingly argued that innovations are likely to arise as new combinations are made, especially cross-disciplinary combinations. (Schenk, 2005, p.25) Apart from economics, I studied (a bit of) Law, Social Science, Political Science and Mathematics.[1] The research in this dissertation is done in a

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[1] I have a bachelor in Economics and Law, a master in Economics and Social Science, followed a course from the Utrecht School of Governance on Inclusion and Exclusion in Contemporary European Societies, and followed a mathematics course Infinitesimal Calculus at the Mathematics Department of Utrecht University and a NAKE-course on Mathematical Economics.

multidisciplinary manner in the sense that I combine economic tools, like model building from theoretical micro-economics (Chapter 4 and 7) and estimation models from econometrics (Chapter 4, 5 and 6), with other disciplines like law (Chapter 7), political science (Chapter 4 and 7), geography (Chapter 5) and criminology (Chapter 6).

There are not many economists researching money laundering; most of the researchers in this field come from law, sociology or political science. Three of the better known economists in this field (Donato Masciandaro, Elöd Takats and Brigitte Unger) published a book in 2007 called 'Black Finance: The Economics of Money Laundering'. Combining the components of multidisciplinary research and the work of economists researching money laundering resulted in 'the Multidisciplinary Economics of Money Laundering'.

This dissertation is based on a series of four studies, which try to answer the prominent questions on money laundering. One of these studies is published as a book by *Edward Elgar* (Chapter 6), while the other three are journal articles. One of these journal articles is published in *Review of Law and Economics* (Chapter 4), one is accepted by *Applied Economics* (Chapter 5) and one is not published yet, but only submitted to a journal (Chapter 7). Although some of these publications are co-authored, I am the lead author and lead researcher of each of these publications.

1.2. The Concept Money Laundering

The proceeds from crime differ from the proceeds from legal activities in one important aspect: they cannot be spent as easily, especially not on luxury goods like villas, sports cars and boats. Money laundering is (at least to some extent) needed in order to spend the money derived from illegal activities. The term 'money laundering' is derived from the gangster Al Capone, who funnelled his ill-gotten gains through launderettes to make them appear legal (van Duyne, 2003, p.73). Governments continue to fight (the consequences of) money laundering. The statement at the October 1996 Annual Meetings in Washington, D.C. of the International Monetary Fund's (IMF) Interim Committee—its highest decision-making authority—featured money laundering as one of the most serious issues facing the international financial community (Camdessus, 1998). The Financial Action

Task Force (FATF) – an intergovernmental body established by the G-7 countries in 1989 – takes the lead in the international fight against money laundering by setting anti-money laundering policy standards and incentivizing all countries around the world to comply with them.

The definition of money laundering is not completely universal[2], but the basic idea is that one gives proceeds of crime an apparent legitimate source, or at least disguises the illegitimate source. If we define 'black money' as proceeds of crime and 'white' as not having an illegal source, then we can simply refer to money laundering as 'making black money appear white'. The crucial part of money laundering is to disguise the link between the criminal, the money and the predicate crime.[3]

Since the whole idea of money laundering is to make sure it goes undetected, it is not possible to directly measure the amount of money laundering. However, there are some estimations of the amount of money laundering. In 1998 the managing director of the IMF, Michel Camdessus, did the first estimation of money laundering. He estimated the level of money laundering at 2 to 5% of world GDP. This estimation does not have an empirical back-up and can be seen as what I would call 'a guesstimate'. Walker (1995 and 1999) and Unger et al. (2006 and 2007) find figures within that same range. These estimations are based on a theoretical model fuelled with statistics and assumptions. Although I see this model as a serious improvement in this field, some of the assumptions of this model are strong, and hard to test due to a lack of data. We simply don't know enough yet to measure the amount of money laundering adequately.[4] Chapter 2 presents and discusses the different methods and models to estimate the amount of money laundering.

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[2] See Unger et al. (2006), chapter 1 for an overview of money laundering definitions.

[3] Note that I now use the word money instead of proceeds. The proceeds from crime can be money, goods or anything else. This means that the term 'money laundering' is actually incorrect, because also other forms of criminal proceeds can be laundered. So when using money in this context, one should read 'money or criminal proceeds in other forms'. For readability I restrict myself to the term money, in line with the term 'money laundering'.

[4] Note that this is not how it is perceived by the general public. These estimations are taken seriously and are quoted often. When our report (Unger et al. 2006) was published, the media picked up the report. In the publication process the nuance got lost and the sentence that got stuck was that the amount of money laundering in the Netherlands is 18 billion euro per year.

With estimations of money laundering of this magnitude, we could ask ourselves a lot of questions. For instance, does it matter that these amounts of money are flowing in and out countries for the purpose of money laundering? And if it matters, which effects would that have? How is this money transferred around the world? Which decisions do the money launderers make when performing money laundering operations? Where does all this money end up? How can we fight money laundering? Although this list of questions might seem overwhelming and unable to answer all at once, this dissertation makes a serious attempt to do so.

1.3. Why is Money Laundering an Issue?

Why is money laundering illegal and why should it be fought? A money laundering transaction does not really have a direct victim; nobody gets hurt. It can be just a deposit of money and a transfer to your own bank account. John Stuart Mill concluded already in 1859 that governments should not forcibly prevent people from engaging in victimless crimes, because it does not harm others. (Mill, 1859) Moreover, since these transactions can be made within the financial system, the general public won't even notice that it happens. So why would we fight something almost invisible that does not hurt anybody?

The most direct effect of fighting money laundering is that the law enforcement agencies have a second chance to catch the criminal. The bank robber that got away might still reveal himself when he starts to invest the money he made. Even if the police are unable to proof the bank robbery, he can still be convicted for money laundering and the proceeds of the bank robbery can be confiscated. All is well that ends well. This idea seems the reason money laundering was criminalized in the first place. When the US found out that it could not win the 'war on drugs', they decided to go after the money of the drug lords. In 1986 the Money Laundering Control Act was enacted, which basically started the 'war on drugs money'.

But there is more to it: the literature on money laundering lists a whole range of effects (see the literature overview in Chapter 3). Although the literature mentions many effects on the real sector (like effects on consumption, savings, investment, price increases, competition, import and exports, FDI, output, income and employment), most

concern seems with the effects on the financial sector (with increased risk for the solvability, liquidity, reputation and integrity of the financial sector). But money laundering could also be good for our economy, e.g. because it increases the profits for the financial sector and leads to a greater availability of credit. It is therefore still uncertain whether money laundering would have a positive or negative effect on the economy in the long run. Chapter 3 discusses the effects of money laundering in more detail.

Hardly any of the effects listed in Chapter 3 are backed up with empirical evidence. Most of them are theorized and some even seem to have no traceable source at all. All these effects of money laundering are therefore in need of empirical testing. The criminologists researching money laundering seem uninterested or unable to answer the question on what the effects of money laundering actually are. Mainly economists, like Baker (2005), Tanzi (1997), and Quirk (1996), attempt to estimate these effects.

In this dissertation I show how it is possible to estimate one of the effects of money laundering, circumventing the problem that we lack the most important variable for the estimation: the amount of money laundering in each country in every year. Chapter 4 estimates the effect of anti-money laundering policy on the level of crime.

1.4. How is Money Laundered?

Without going into too much detail, this section presents four basic money laundering techniques. The most simple and basic method would be to add cash money to a cash-intensive company. Al Capone did this when he added his crime money to the turn-over of launderettes throughout Chicago. One simply opens a bar, or starts another cash-intensive business, and every day one adds a bit of the proceeds of crime to the money that is already in the cash drawer. Eventually, it seems as if the bar is making quite some profit and that the money is earned faithfully. The disadvantages of this method are that it only works as long as the money laundering amounts are quite small and that investigators might be able to relate the turn-over to the inputs or clientele of the business and uncover the money laundering operation.

Another, quite simple method of money laundering is by faking that you won the money. For instance, you go to a casino and use the crime money to purchase a lot of chips. After a while, you present the chips to the cashier of the casino with the explanation that it was your lucky day. You ask the cashier to transfer the 'winnings' to your bank account to give you an apparent legal source for the money. The disadvantages of this method are that this only works with relatively small amounts of money, that one cannot do this repetitively and that your operation can be uncovered and easily proven with the number of video cameras that are often present in a casino.

Money laundering methods for large sums of money can basically be divided in two categories: through the financial system and through trade. Money laundering through the financial system is often called the traditional way of money laundering. This method is what most of the money laundering literature is about. Also the international fight against money laundering seems to focus mostly on this form of money laundering. Figure 1.1 shows the basic idea of this method. After you committed a crime and made a lot of money with it, you try to get this money into the financial system. Whether this is actually needed depends on the type of crime you commit, in fraud cases for example it is often the case that the money never leaves the financial system. Once the money is in the financial system, an indecipherable web of wire transfers, private loans, false payments, trusts and offshore companies all around the world creates a façade which makes it impossible to trace back the source of the money. Once the source is untraceable, one can start to spend the money. This money laundering method is often described in a three phase model of placement, layering and integration. I will not describe these phases in detail, because the applicability of the different phases depends on many aspects and because there is a debate on whether this model should not be a four phase model with a justification phase at the end (Koningsveld, 2008).[5] The disadvantage of this type of money laundering is that most of the standards in the international fight against money laundering seem to focus on it. The gatekeepers of the financial system (mainly banks, but also all kinds of other business and professions, like accountants, lawyers, notaries,

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[5] Unger (2007) chapter 5 gives a fairly good overview of the literature on the three phases model and the different money laundering techniques within each phase.

car dealers, jewellers, etc.) have the obligation to report any suspicion transaction that can relate to money laundering in basically all countries in the world. Especially getting cash money into the financial system and the eventual investment of crime money should therefore become harder.

Figure 1.1. The traditional money laundering method
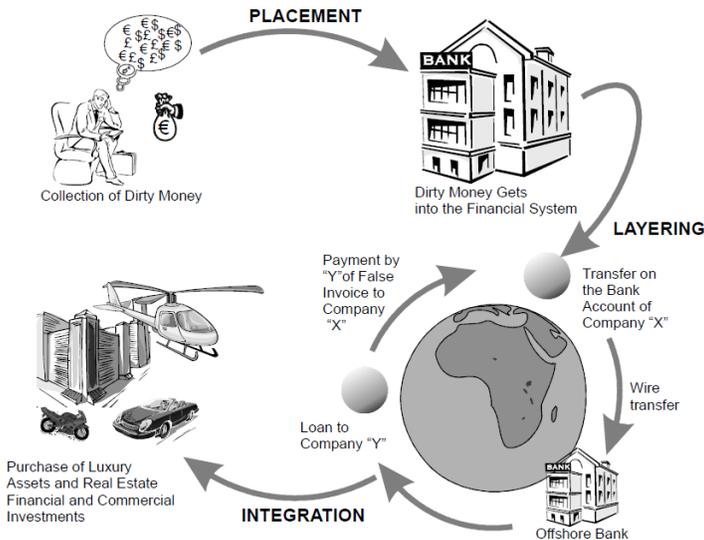
Source: Unger (2007), inspired by UNODC (2006)

An alternative to money laundering through the financial sector is trade-based money laundering. Trade-based money laundering is a relatively new form of money laundering that is easiest explained with an example. Let's say you robbed a bank in the US and you want to enjoy these proceeds of one million dollars in the Netherlands. What you can do is set up two companies: one in the US and one in the Netherlands. Consequently, you buy a thousand watches in the US of a thousand dollar a piece.[6] You then ship these watches to the Netherlands with your company in the US being the exporter and your Dutch company being the importer. Instead of sending the appropriate invoice however, you send an invoice listing a thousand watches of only ten dollar a piece. Consequently,

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[6] Note that for such a purchase of one million dollar, it might be needed to have the money on a bank account. There are several ways to accomplice this (see Unger, 2006, chapter 5.1), but that might not be needed if the bank robbery is committed in a very modern way, e.g. hacking into the bank's mainframe and transferring the money to your (anonymous) bank account.

your company in the Netherlands sells the watches for their actual value of a thousand dollar on the Dutch market. It now appears as if you are a successful businessman in the Netherlands with a company that was to do what business is about: buy cheap (ten dollar a piece) and sell expensive (thousand dollar a piece). Your money laundering operation is now completed, because it appears as if the almost a million dollar[7] is from a legitimate source. In the example the products are undervalued on the invoice, but the reverse can also be done by overvaluing the products. The Financial Action Task Force (2006) "concludes that trade-based money laundering represents an important channel of criminal activity and, given the growth of world trade, an increasingly important money laundering and terrorist financing vulnerability. Moreover, as the standards applied to other money laundering techniques become increasingly effective, the use of trade-based money laundering can be expected to become increasingly attractive." As it is a quite recently discovered form of crime, not much research on trade-based money laundering is yet available.

Chapter 5 examines trade-based money laundering from the US. With the trade-based money laundering estimates of Zdanowicz we explore how these money launderers behave and whether this is in line with the assumptions made in the estimation models of Walker (1995) and Unger (2007).

1.5. Where does all this Laundered Money go?

As mentioned in Section 1.2, estimations of the level of money laundering reach up to 2 to 5% of world GDP. Such estimations automatically raise the question where all this money goes. It is quite hard to believe that such an amount of money can be invested without drawing attention in a specific sector. A possible answer might lie within the real estate sector, since it is large enough to absorb a large part of this money, and prone to money laundering because of features such as the heterogeneity of buildings, the non-transparency in the market and possibilities for hiding the true owner. So far, however,

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[7] Because the Dutch company bought the watches for a total amount of ten thousand dollar, the actual profit is 990,000 dollar.

no systematic study has been conducted on the importance and frequency of money laundering in the real estate sector.

Chapter 6 tries to use the information known to authorities to systematically identify and analyse money laundering in the Dutch real estate sector. Though the data refer to the Netherlands only, the method can be used for other countries as well.

1.6. How can we Fight Money Laundering?

Money laundering is typically a transnational crime. The reason for cross-border activity in money laundering operations is probably because this can add a layer of disguise and because the attitude towards money laundering could be more tolerant in other countries. The fight against money laundering therefore needs an international approach. As long as there is one country in the world that offers money laundering services instead of fighting money laundering, the anti-money laundering efforts in all the other countries in the world are rather useless. The lead in the international fight against money laundering is in the hands of the FATF, which is an intergovernmental body established by the G-7 countries in 1989. The FATF strives for an appropriate combat of money laundering in virtually all countries around the world. Today, almost all countries in the world are member of the FATF or a FATF-regional style body.[8] The strategy to achieve a global commitment to fight money laundering is based on two pillars: setting standards and consequently evaluating countries on their compliance with these standards. FATF standards and evaluations are not based on hard law, but on recommendations. However, since the FATF uses soft law instruments like blacklisting, basically all countries of the world more or less 'voluntarily' had themselves evaluated and aim at complying with the FATF standards. Compliance with these standards is the basis for the policy study in Chapter 4. The FATF mutual evaluations were checking mostly law in the books at first, but are now more and more on law in action. Evaluating law in action is a cumbersome task, which makes it an academically interesting challenge.

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[8] The countries that not seem to be member or observer of the FATF or a FATF-regional style body are: Angola, Cuba, Ethiopia, Iran, North Korea, and Sao Tome and Principe. (retrieved from http://www.fatf-gafi.org/countries/ on July 29, 2012)

Chapter 7 studies how the international approach of anti-money laundering developed and identifies the current situation as a sort of principal-agent problem with strategic behaviour. The chapter consequently discusses possible policy options for the future of FATF evaluations.

1.7. The Relation Between Money Laundering and Terrorist Financing

Although money laundering and terrorist financing are often linked, this dissertation is only about money laundering. Although I understand why money laundering and terrorist financing are often linked in terms of policy making – both are part of the same financial regulation and are about analysing money flows – academically the two are distinct concepts. While money laundering tries to give a legitimate source to the proceeds of crime ('making black money white'), terrorist financing is about using both legitimate and illegitimate money to commit a crime ('making grey money black'). I therefore think that in a policy study the two concepts can be researched simultaneously, but that the behaviour of the money launderer and the terrorist financier need a different type of analysis.

1.8. Outline

Now that this introduction has set the stage and asked the prominent questions on money laundering, the chapters 4-7 try to answer these questions. Chapter 2 and 3 give a literature overview of the models used in money laundering research and the effects of money laundering, respectively. Chapter 4 explores one of these effects of money laundering so that we can eventually answer the question '*why is money laundering an issue?*'. The effect that is estimated in Chapter 4 is to what extent preventing money laundering would help to reduce crime in general. The second question that we asked ourselves is '*how is money laundered?*'. Chapter 5 analyses how trade-based money laundering works, and which choices these money launderers make. To answer the question '*where does all this money go?*', Chapter 6 systematically analyses money laundering in the real estate sector. Chapter 7 focuses on '*how can we fight money laundering?*' by modelling the current state of anti-money laundering policy to sketch policy options for the future.

Chapter 2. Models in Money Laundering Research: A Literature Review

2.1 Introduction

The most used research methods to study money laundering are of a criminological nature. This literature overview presents and discusses the economic models used in money laundering research. We can basically classify these models into three categories: Models to estimate the amount of money laundering, models to describe the behaviour of money launderers and models to describe the behaviour of countries in the international fight against money laundering. This chapter is ordered along this classification. Models to estimate the effects of money laundering are discussed in Chapter 3 of this dissertation.

2.2 Models to Estimate the Amount of Money Laundering

Demand for estimations of the amount of money laundering by far exceeds its supply. International institutions, governmental institutions, researchers, NGOs, law enforcement agencies and the media want a "magic number" of how much money is laundered annually, preferable specified per country. International institutions and government institutions need this magic number to justify the costs of anti-money laundering policies and to choose how and where to invest in anti-money laundering policies. As Reuter and Greenfield (2001, p.171) put it: "knowing the value of drug exports from Mexico to the US is US$1-3 billion rather than US$10-20 billion may be very important for purposes of allocating resources for money laundering investigations or even passing money laundering regulations in Mexico." Researchers are, of course, interested in this number to ease money laundering research (e.g. Chong and Lopez-de-Silanes, 2007 and Ferwerda, 2009), such as analysing the behaviour of money launderers or estimating the effects of money laundering. What the Transnational Institute (2003) concludes on estimates of the drug markets, also holds for money laundering estimates: "Most users of the data cite figures without first studying the methodologies used or reading the studies that produced them. They want the 'facts' but they do not want to be bothered by the devil in the details." (Transnational Institute, 2003)

The Walker Model

Probably the most cited and most controversial estimations of the amount of money laundering are based on the Walker-model. Walker (1995 and 1999) is a pioneer in the field estimating the amount of money laundering per country using a type of gravity model. His estimation procedure basically consists of four main steps:

1. Identify all the relevant crime data for all countries in the world
2. Estimate how much money is made with these crimes
3. Estimate which percentage of these proceeds are laundered
4. Estimate how this money is allocated over the world

Crime data is never a perfect representation of the actual amount of crime in a country, but its use (especially when combined with crime victim surveys, as done by Walker) seems to be generally accepted. Because crime data is not available for all countries in the world, Walker (1999) uses regional averages to fill the gaps. Once crime data for all countries in the world is available, we can in step 2 multiply them with the average proceeds of these crimes to come to the overall estimate of money made by crime in all countries in the world. To come to the total amount of money that needs of laundering in step 3, Walker estimates how many of these proceeds are in need of laundering by using a percentage for each type of crime.[9] This procedure basically gives the amount of money that is in need of laundering in the world with the following formula:

Total amount of money laundering = number of crimes * proceeds per crime * % laundered

Step 4 of the Walker-model is a type of gravity equation to estimate how this money ready for laundering is spread over the world. For over decades the gravity model has been successfully applied to flows of the most widely varying types, such as migration,

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[9] Note that step 2 and 3 are basically merged in Walker (1999) by using earlier obtained estimates (in Walker, 1995) on the average amount of money laundered per recorded crime. This also means that he circumvents the issue in step 1 that recorded crimes do not represent the amount of actual crimes.

buyers distributed across shopping centres, recreational traffic, commuting, patient flows to hospitals and interregional as well as international trade. (see Chapter 5 of this dissertation) The assumption of Walker is that money laundering flows can be explained with the following formulas:

$$F_{ij} \Big/ \sum_i F_{i,j} = \left((GNP_j / Population_j) * Attractiveness_j \right) \Big/ (\text{Distance})^2_{i,j}$$
$$Attractiveness_j = 3BS_j + GA_j + Swift_j - 3CF_j - CR_j + 15$$

where GNP_j is GNP per capita, F_{ij} is the amount of money laundering flowing from country i to country j, *BS* is banking secrecy and *GA* government attitude towards money laundering, *Swift* indicates countries with financial institutions that are member of Swift, *CF* refers to conflict and *CR* stands for corruption. 15 is added to the attractiveness to avoid negative values.

Walker (1995 and 1999) assumes which country characteristics attract money launderers and the importance of these characteristics; there is no empirical underpinning why for instance Bank Secrecy is three times as important as Corruption. Apart from choosing the relevant characteristics and their weights, Walker also makes important assumptions on the form of the formula. Walker's form deviates from a standard gravity equation in the sense that instead of a complete multiplicative model, Walker chooses a combination of multiplication and addition (see Chapter 5 of this dissertation for more details).

Note that step 4 of the Walker model is needed to estimate the amount of money laundering per country, but that for the worldwide estimate step 4 is unnecessary.

Unger (2006 and 2007) adapts the Walker-model and applies it to the Netherlands. She adapts the original Walker-model by a) replacing the distance simply measured in kilometres by a cultural distance, which includes three 'cultural' factors: sharing a common language, having colonial ties or being major trading partners; b) including two new factors to the attractiveness indicator, being the 'membership of the Egmont group', a cooperation of national Financial Intelligence Units fighting money laundering, and

'financial sector size' (measured as deposits), as a proxy for the fact that extended financial markets make it easier to launder criminal proceeds; c) using the distance between the countries in the attractiveness factor, instead of its square, because empirical findings show most gravity equations for trade come up with an estimate for the coefficient of distance of around -0.9 (Helliwell, 2000), d) replacing GNP per capita by GDP per capita and e) using 10 instead of 15 in the attractiveness formula to avoid negative values. This means that Unger (2006 and 2007) explains money laundering flows with the following formulas:

$$F_{ij} \Big/ \sum_i F_{i,j} = \left((GDP_j \big/ Population_j) * Attractiveness_j \right) \Big/ (Cultural\ Distance)_{i,j}$$

$$Attractiveness_j = 3BS_j + GA_j + Swift_j - 3CF_j - CR_j + FD_j - EG + 10$$

$$Cultural\ Distance = Language + 3Trade + 3ColonialBackground + PhysicalDistance$$

The validity and reliability of the estimates of the (adjusted) Walker-model depend on the credibility of the assumptions and the quality of the data. The main advantage in this sense is that the results of the Walker model look credible and are in line with the estimate of the managing director of the IMF, Michel Camdessus.[10] Reuter (2007) criticizes the data that are used in the Walker-model. He highlights for instance that the fraud figures are based on estimates from people that are unable to know the answer and of which only 10% replied at all. (Reuter, 2007, p. 4-5) Moreover, Reuter (2007) mentions that Walker's estimated percentage of the drug money that is laundered is implausibly high at 83%. Van Duyne (2011, p.44) shares Reuter's concerns in the use of experts to estimate how much money is gained from particular categories of crime and how much of that is laundered and mentions that this approach seriously comprises the basic measurement requirements of validity and reliability. Moreover, Van Duyne (2011) criticizes the use of averages to extrapolate, because the distribution of criminal income is

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[10] In 1998 the managing director of the IMF, Michel Camdessus, did the first estimation of money laundering. He estimated the level of money laundering at 2 to 5% of world GDP. This estimation does not have an empirical back-up and can be seen as what I would call 'a guesstimate'.

skewed; many low-income criminals and few high earners (see van Duyne and de Miranda, 1999 and van Duyne and Soudijn, 2010). Chapter 5 of this dissertation tests the Walker model - specifically its structure and its weights – by using estimates for a specific type of money laundering: trade-based money laundering. The results of this test suggest that a gravity model can explain money laundering flows, but that the structure of the Walker model and the assumed weights are not appropriate.

A restriction of the Walker model is that it only estimates the first time money crosses a border. Since money can cross many borders in a money laundering procedure before it reaches its final destination, the Walker model probably underestimates the amount of money actually flowing across each border. The model is therefore not really useful for policy makers that for example want to know where most of the money laundering flows into their country come from. On the other hand, a lot of double counting would occur without this restriction.

The Walker-model is still one of the most promising methods to estimate money laundering with a sound intuition on how we should come to such an estimation, but at the moment its poor data and strong assumptions, which are hard to back-up empirically, raise doubt on its reliability. More research is therefore needed. The critique already gives new information to build upon, such as the distribution of criminal proceeds found by van Duyne (see van Duyne and de Miranda, 1999 and van Duyne and Soudijn, 2010) and the structure of the model and the importance of its determinants found in Chapter 5 of this dissertation. Moreover, the reliability of the Walker model increases over time when the underlying data improves.

Two-Sector Dynamic General Equilibrium Model

Bagella et al. (2009) develop a two-sector dynamic general equilibrium model to estimate time series on the amount of money laundering for the US and the EU-15 based on simulations. The fully micro-based model has three types of agents: Government, firms and households. The firms produce two commodities, the regular good and the criminal good. Households have the option to work partly in the legal economy (wage) and partly

in the illegal economy (more liquidity). They face transaction costs in both sectors and also costs of being detected in the illegal sector. Firms and households use the criminal sector to carry out criminal activities and the formal economy to hide the revenues of these activities with money laundering. The government sets fines, can influence the probability of detection, and can influence the liquidity (money supply) of the economy. Consequently they build a full general equilibrium model with modeling the behavior of all agents. Money laundering is introduced in the model as a means to buy the legal good when the limited money supply constraints households to do so. After deriving the general equilibrium with first order conditions for households and firms, Bagella et al. (2009) find that the optimal amount of money laundering in the equilibrium depends on a) the regular consumption elasticity, b) the irregular consumption elasticity, c) the regular consumption weight, d) the disutility of supplying labor for money laundering, e) the probability of being detected, f) the capital share, g) the transaction costs and h) the inverse Frisch elasticity of labor supplied to money laundering. Consequently, they find a calibrated value for all these factors, which are used in a simulation to forecast the development in the regular and irregular sector. Once Bagella et al. (2009) confirm that their forecasts of the regular economy are fairly accurate, they conclude that the irregular sector forecast also accurately predicts the irregular economy, which enables them to estimate the amount of money laundering as a share of GDP.

This approach comes originally from the shadow economy and did not yet receive as much attention as it may deserve. Although it might remain a theoretical model with strong assumptions, it does give a new estimation with a completely different method. It could therefore be one of the inputs in a triangulation method.

DYMIMIC

Schneider (2008) uses the Dynamic Multi Indicators Multiple Causes (DYMIMIC) econometric approach to estimate how the amount of money laundering develops over time. The approach is borrowed from the literature on estimating the size of the shadow economy, where it is also applied by Schneider. The idea of this approach is that there are causes for money laundering (like crime and bank secrecy) and indicators that go

parallel with money laundering (like increase in money demand and the number of convicted money launderers). The assumption is that these two sets of variables are statistically independent of each other and are related through the underlying unobservable (latent) variable money laundering. If money laundering is caused by variables x in the following manner

$$ML = b'x + c \qquad\qquad (2.1)$$

and money laundering is indicated by variables y in the following manner

$$y = aML + e \qquad\qquad (2.2)$$

then one can estimate the relevant coefficients a, b, c and e by substituting (2.1) into (2.2) and estimating (2.3), which does not include the latent variable money laundering.

$$y = ab'x + (c + e) \qquad\qquad (2.3)$$

Consequently, one can use these relevant coefficients and the development of the variables x and y to estimate the development of the latent variable money laundering. This intuition is visually shown in Figure 2.1.

The dynamic model of Schneider (2008) has the advantage of measuring the development of the amount of money laundering over time. The downside is that this model always needs a reference level borrowed from another study. Although this model is still in its development stage to estimate money laundering, it has been often fully developed and tested in the field of shadow economy estimations. In the shadow economy field it is probably the most quoted but also the most controversial model. Mainly Breusch (2005) criticises the model and argues that it is vague in its specification, sensitive to the units of measurement and hard to reproduce. The same seems to hold for its application to money laundering.

Figure 2.1. Visual representation of the intuition behind the DYMIMIC model
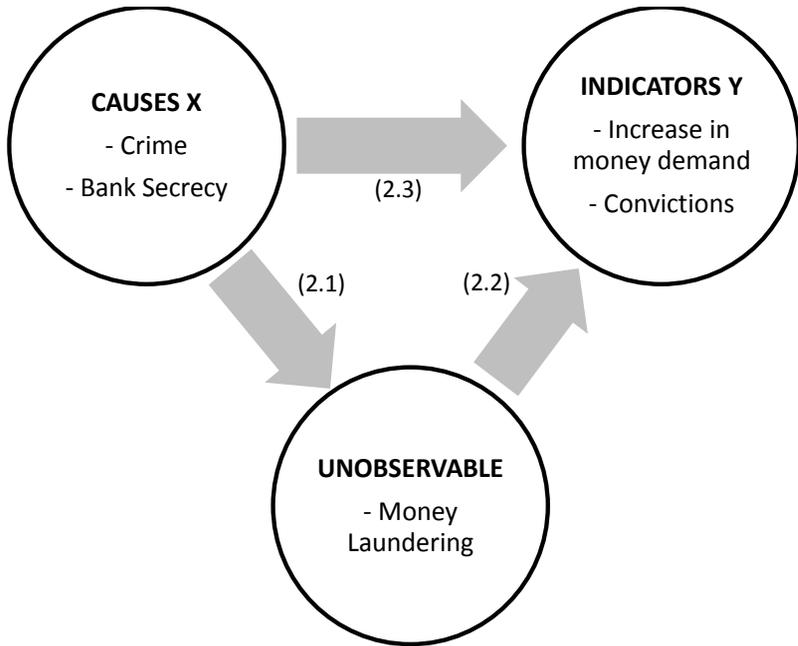
Trade-Based Money Laundering estimation of Zdanowicz

Zdanowicz (2009b) only estimates a specific type of money laundering: trade based money laundering (see Chapter 1.4 of this dissertation for a brief description of trade based money laundering). His approach is distinctively different from the former models in the sense that it does not rely on micro or macro-economic modeling, but on the more statistical tool of data mining. Zdanowicz (2009b) analyzes monthly export and import data from the United States Merchandise Trade Data Base on a very detailed ten digit product classification level.[11] The United States Department of Commerce, Bureau of Census produces this database, which is used to determine the United States balance of

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[11] Transactions are classified under approximately 8,000 different products. Every item that is exported is assigned a unique 10-digit identification code. The Harmonization Code System (HS-Code) is a system of progressively more specific identifiers for a commodity. For example, concentrated frozen apple juice is assigned a 10-digit identifier. This number is an aggregate of a series of codes starting with a broad category assigned a 2-digit identifier described as Preparations of Vegetables, Fruit, Nuts, etc. It is then assigned a 4-digit identifier described as fruit juices and vegetable juices, etc. The 6-digit identifier is described as apple juice. Information from http://exim.indiamart.com/product-classification/ on May 9, 2011

trade. Zdanowicz (2009b) identifies suspicious merchandise that can be related with trade based money laundering by comparing its price with the standard price for those products. The assumption is that international trade transactions involving abnormally high or low prices indicate money laundering (for the thresholds, see Zdanowicz, 2009b). To illustrate this procedure, assume that Figure 2.2 shows the price range of a certain product, say bottles of ketchup. All transactions with a price below the 5% margin or above the 95% margin are classified as possibly trade based money laundering for the amount the price differs from the mean.

Figure 2.2. Theoretical price range of a certain product
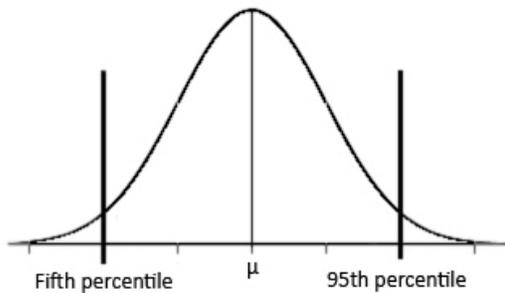
The disadvantage of such an estimation procedure is that not only money laundering is detected, but all abnormal behaviour that is present in the data. In this case also typing errors and transfer pricing will be indicated as money laundering, possibly overestimating the actual amount. On the other hand, trade based money laundering might still go unnoticed when done with products that have large price ranges or that are even impossible to measure, such as advice and other consulting services. An advantage of Zdanowicz' work is that the result is a rich dataset which indicates all trade based money laundering flows from and to the US, even specified for each of the 45 custom districts, which is unique in the field of money laundering. This dataset forms, among others, the basis for Chapter 5 of this dissertation.

Unger and Ferwerda (2011)

The research presented in Chapter 6 of this dissertation (Unger and Ferwerda, 2011) creates possibilities for a fundamentally different approach to estimate the amount of money laundering on sector level, in this case the real estate sector. Although not executed in Chapter 6, its results can be the basis of an estimation of money laundering. Chapter 6 shows that with a multidisciplinary approach of economics and criminology one can develop an indicator-based detection model for money laundering in the real estate sector. The empirical analysis concludes with the use of a Probit estimation that there are three remarkable characteristics of a real estate object that are associated with a significantly higher chance that money laundering is involved. With this information one could be able to estimate an expected probability of money laundering for each and every real estate object. If one then multiplies this with the average amount of money laundering per real estate object (either a percentage of its value or an absolute number based on its characteristics) one would have an estimation on the amount of money laundering in the whole sector. In formula form the basic intuition would be:

$$Amount\ of\ Money\ Laundering = \sum_i (P(ML)_i * amount\ if\ P(ML)=1_i)$$

Where *P(ML)* is the expected probability that money laundering has happened with a certain real estate object (based on e.g. the results of Chapter 6 of this dissertation) and where *amount if P(ML)=1* is the average amount of money laundering detected in the real estate objects that are connected with money laundering. Of course the application of such a method requires extra research, both in terms of estimating the two variables, as well as in the robustness of these estimations. Although we now have this basis for real estate objects only, one could possibly apply the same methodology to bank accounts, trust offices, boats, etc.

2.3. Theoretical Models on the Behaviour of Money Launderers

The behaviour of criminals is traditionally analysed by criminologists, but since Gary Becker introduced the economics of crime in 1968, economists have also shown interest.

To date, the number of theoretical economic models on the behaviour of money launderers is limited.

Masciandaro (1999)

Masciandaro (1999) models what criminals do with their proceeds of crime and the role of money laundering (regulation) in this. He shows that money laundering can be seen as a multiplier of criminal activities that transforms illegal potential purchasing power into legal effective purchasing power. Moreover, he explains that money laundering regulations on the one hand fight money laundering and crime but on the other hand burden the financial system. He eventually derives a multiplier in his model that explains growth in illegal activities through money laundering. The basic idea is that criminals have proceeds from crime (ACI), which can either be directly invested in illegal markets (1-y) or need to be laundered (y) with the corresponding costs (c). This laundered money is consequently either invested in legal markets (1-q) to generate legal returns (rl) or in illegal market (q) to generate illegal returns (ri). Masciandaro derives a multiplier that describes how an original amount of proceeds of crime increases the total amount of illegal financial flows (AFI) over time due to an infinite series of money laundering, if the proportions are constant. The derived multiplier is:

$$AFI = y / (1 - (q(1-c)(1+ri))ACI$$

Policy makers can reduce this multiplier by increasing the costs of money laundering (c), but since this is costly due to the burden for the financial sector, there is a trade-off between the effectiveness of money laundering regulations and efficiency in the financial sector.

Masciandaro (1999) assumes a closed economy, but Unger (2007, p.161) argues that the issue of money laundering would not lose its significance if one introduces heterogeneous regulations in an increasingly integrated financial market.

Barone (2000) modified Masicandaro's model by assuming that laundered money is not reinvested in the illegal sector (thereby complicating the multiplier). This seems an

unnecessary and unrealistic assumption, because a lot of crime needs at least some laundered money, for example to buy a car for a bank robbery, buy a house for the production of xtc or buy a truck or boat to smuggle drugs from the producing country to the consuming country.

Unger (2007) finds it unrealistic that the return from reinvestments in illegal markets is completely laundered in Masciandaro's model and argues that it is more realistic to assume that this is done only partly (for only fraction y, as in the first step of Masciandaro's model). Consequently, Unger (2007) derives the following modified multiplier:

$$AFI = y/(1-(q(1-c)y(1+ri))ACI$$

Barone (2006) argues that the multiplier should not depend on the amount of money put into the money laundering process (yACI) – as done in the models of Masciandaro (1999) and Unger (2007) – but on the amount of money that comes out of the money laundering process (y(1-c)ACI). Consequently, she argues that the multipliers should look like:

Masciandaro (1999): $AFI = y(1-c)/(1-(q(1-c)(1+ri))ACI$

Unger (2007): $AFI = y(1-c)/(1-(q(1-c)y(1+ri))ACI$

Unger (2007) is the only one that actually tried to apply this multiplier by using likely values for all the proportions. After applying a range of likely values for the Netherlands – based on all sort of data and intuitions – Unger (2007) finds that the original Masciandaro multiplier (without Barone's (2006) modification and without Unger's (2007) modification) has a value between 1 and 3 in most cases, and most likely a value between 1.1 and 1.25, and that the Masciandaro multiplier modified by Unger (2006) (without Barone's (2006) modification) has a value between 0.9 and 2 in most cases and most likely a value between 1.06 and 1.1.

Ferwerda (2009)

Ferwerda (2009 and Chapter 4 of this dissertation) derives a theoretical model on the behaviour of money launderers by extending Becker's model on the economics of crime. According to Becker, some persons become 'criminals', not because their basic motivation differs, but because their benefits and costs of crime differ. (Becker, 1968, p.176) Whether a person will perform a specific criminal act or not then depends on his probability of conviction (p_j), on his punishment if convicted (f_j) and on other variables, such as income available to him in legal and other illegal activities, the frequency of nuisance arrests and his willingness to commit an illegal act. Becker (1968, p. 177) describes the expected utility of committing an offence as;

$$EU_j = p_j U_j (Y_j - f_j) + (1 - p_j) U_j (Y_j)$$

with EU_j as the expected utility from committing an offence, U_j as a utility function and Y_j the income, monetary plus psychic, from committing an offence. This means that a higher probability of conviction and a more severe punishment would lower the expected utility as long as the marginal utility of income is positive. (Becker, 1968, p.177)

Ferwerda (2009) extends this model by reasoning that with money laundering regulations in place, if a criminal could not use his profits before laundering them, he faces the chance to be caught (q) and be punished for laundering money (f_{ml}), and consequently the chance to get convicted for committing the original crime (z). In addition to this, each money laundering operation implies aggregate transaction costs (tc), represented by the resources a criminal needs in order to put the money laundering process into action. To model the above-mentioned reasoning, the model Becker (1968) presented on the expected utility of criminal behaviour and the supply of offences is adjusted to:

$$EU = pU(y - f_o) + (1 - p)qzU(y - f_{ml} - f_o - tc) + (1 - p)q(1 - z)U(y - f_{ml} - tc)$$
$$+ (1 - p)(1 - q)U(y - tc)$$

If positive marginal utility from income is assumed and *U* is a von Neumann-Morgenstein utility function, one can show with first-order conditions that the supply of offences is negatively related to all the factors in this model: p, q, z, f_o, f_{ml} and tc (see Formula A4.2-7 in Appendix 4.1). This result shows theoretically that anti-money laundering policy does not only fight money laundering, but also crime in general.

Note that the transaction costs factor (*tc*) from Ferwerda (1999) is the same as the transaction costs factor (*c*) in Masciandaro (1999). Also the intuition that regulators can influence these costs to affect the decision-making of criminals overlaps.

2.4. Theoretical Models on the Behaviour of Countries Fighting Money Laundering

The theoretical models on the behaviour of countries in the international fight against money laundering mainly focus on whether and to what extent countries should fight money laundering.

Masciandaro and Portolano (2003)

Masciandaro and Portolano (2003) model the international fight against money laundering as a game between a club of countries fighting money laundering (A) and an individual country that is inclined to allow money laundering (B). In the simple version of their game, club A can perfectly observe whether country B fights money laundering. The result of their analysis is that the international fight against money laundering only succeeds if club A pays country B an amount (T) which is enough for country B to offset the costs for money laundering regulation (C) and its lost benefits due to fighting money laundering (R). But this amount is only paid if club A profits sufficiently from the extra integrity of their financial system (I-NI). So the two conditions that must be met are:

$$T > R + C$$

$$T < I - NI$$

It can be quite costly for club A to compensate country B, because the benefits of allowing money laundering can be very high. Therefore the model is later slightly adapted to allow club A to sanction (S) country B in case it would not fight money laundering, for example with a trade embargo.

In the complicated version of their game, Masciandaro and Portolano (2003) introduce the fact that club A cannot perfectly observe the behaviour of country B. Therefore it could be that country B exerts only a low amount of effort (E_l), but that it passes the audits (with chance p) as if it exerts a high amount of effort (E_h). Using expected values, Masciandaro and Portolano (2003) show that for country B to participate in the international fight against money laundering, the following condition must be met:

$$T - E_l > -S \hspace{2cm} \textit{(condition of participation)}$$

Once this condition is met, country B will exert a high level of effort only when

$$T + S(pE_l - pE_h) > E_h(1 - pE_h) - E_l(1 - pE_l) \hspace{1cm} \textit{(condition of efficiency)}$$

But the sanctioning is only credible if the following condition is met for club A:

$$T < U_A(E_l) - U_A(0) \hspace{2cm} \textit{(condition of credibility)}$$

With $U_A(E_l)$ as the utility for club A in case country B exerts a low amount of effort and $U_A(0)$ as the utility for club A in case country B exerts no effort. If the condition of participation is not met, country B will exert no effort. If the condition of efficiency or the condition of credibility is not met, country B will only exert a low amount of effort. If all 3 conditions are met, country B will exert a high level of effort and fight money laundering adequately. Masciandaro and Portolano (2003) therefore show with their model that the choice of a country to fight money laundering adequately depends not only on the incentives of that country, but also on the benefits the other countries get from it through an increase in the integrity of the international financial system.

[25]

Gnutzmann et al. (2010)

Gnutzmann et al. (2010) see countries as suppliers on a market of money laundering opportunities (based on Unger and Rawlings, 2008) that compete with each other. Countries do not want to allow too much money laundering ($q_{l,i}$) because its crime could cause social costs (T) for their population (s_i). In their model, countries interact in the sense that the proceeds of crime committed in a certain country can be laundered anywhere. Essentially a country can therefore benefit from money laundering, without bearing the crime costs associated with it, when the predicate crime is committed abroad. Eventually Gnutzmann et al. (2010) derive the social welfare function for countries in an open economy as:

$$\max SWF_i = q_{l,i}(A - w - (Q^{-i} + q_{l,i})) - T(s_i(Q^{-i} + q_{l,i}))$$

w being the criminal wage that reflects the intensity of crime enforcement and Q^{-i} being the crime output by all countries except for country i. If country i takes the policies of other countries as given, the optimal amount of money laundering opportunities supplied is:

$$q_i^* = (A - w - s_i * c - Q^{-i})/2$$

With c as the costs of crime. Gnutzmann et al. (2008) derive their main conclusion from this equation: small countries have lower marginal costs of money laundering than bigger countries. The intuition is that bigger countries create relatively more crime at home and therefore also bear relatively more of its costs. Gnutzmann et al. (2008) therefore conclude that mainly small countries will provide money laundering opportunities.

Model of Chapter 7 of this Dissertation

In Chapter 7 of this dissertation, countries face the trade-off between showing to the international community that they are actively fighting money laundering – by having its

institutions report a lot of transactions with suspicions of money laundering (r(i)) – and limiting the burden for its financial sector, which incurs costs for making these reports (c). When the country does not fight money laundering enough, it faces a sanction (S) in the form of blacklisting. The strictly monotonous, convex pay-off function for the countries is

$$v(i) = -c * r(i) - p(i) * S$$

where *v(i)* is the overall payoff function, *p(i)* is the probability of being blacklisted, which is 0 if *r(i) > T* and 1 if *r(i) < T*, and *T* is the threshold number of suspicion reports as set by the international community. Consequently it can be shown that – with the assumption that the sanction of blacklisting is sufficiently high (*S > c*T*) – the optimal amount of reports sent equals the threshold set by the international community. This intuitive model shows there is no need for a country to do more than required by the international community, because it faces extra costs without any benefits.

2.5. Conclusion

The models to estimate money laundering do not show any convergence so far, but this is to be expected in a relatively new field of research. One should also wonder whether we should come to one model: it may be that the strength is in the diversification of models. The estimations from all the different models can then eventually be used in a triangulation procedure to come to a robust and reliable estimate for the amount of money laundering.

The theoretical models on the behaviour of criminals show some similarities, mainly in the fact that they show the influence of the government on the decisions of criminals is by making money laundering harder and thereby increasing the costs for laundering activities.

The theoretical models on the behaviour of countries in the international fight against money laundering all question whether countries would want to fight money laundering. The costs and benefits of the anti-money laundering policies differ in the different models

and therefore these models all find their own conditions for countries to participate in the international fight against money laundering.

Chapter 3. The Effects of Money Laundering: A Literature Review

3.1 Introduction

A successful money laundering scheme goes completely unnoticed. Not only the process itself should go unnoticed, also afterwards nothing should be visible. Most crimes eventually have a clear effect: A dead body (murder), a missing item (theft) or a counterfeit product, yet money laundering should leave no trace at all. On top of that, most crimes have a clear victim, whereas in the case of money laundering it is unclear who the actual victim is. These two aspects combined make money laundering an almost invisible crime. One could wonder why we are fighting something which is basically invisible and without a clear victim. John Stuart Mill concludes already in 1859 that governments should not forcibly prevent people from engaging in victimless crimes, because it does no harm to others (Mill, 1859). In order to justify anti-money laundering policies, we have to identify who is harmed by money laundering and to which extent. This chapter gives an overview of the effects of money laundering in the literature.

3.2 Literature overview of the effects of money laundering

The literature mentions one direct effect of the criminalization of money laundering: law enforcement agencies now have an additional opportunity to catch criminals. Apart from this direct effect of the criminalization of money laundering, the literature mentions many indirect effects. A comprehensive literature review yields 24 indirect effects that money laundering can have on the real and the financial sector, shown in Table 3.1. Money laundering can affect the real economy by distorting consumption, savings, investment, inflation, competition, trade and employment. Furthermore, money laundering can affect the financial sector with an increased risk on the solvability, liquidity, reputation and integrity of the sector. Money laundering, on the other hand, could also be good for our economy, e.g. because it increases the profits for the financial sector and leads to a greater availability of credit. The literature is therefore still uncertain whether money laundering would have a net positive or negative effect on the economy in the long run.

[29]

Table 3.1. The effects of money laundering as mentioned in the literature

Effect	Source(s)
1. Law enforcement gets a second chance	Levi (2002) p.182, Levi and Reuter (2006) p.292 and 349
2. Distortion of consumption	Bartlett (2002), Mackrell (1997), Walker (1995)
3. Distortion of investment and savings	Aninat et al. (2002), Bartlett (2002) p.19, Camdessus (1998), Mackrell (1997), McDonell (1998) p.10-11, McDowell (2001), Quirk (1997), Tanzi (1997) p.95-96, Walker (1995)
4. Artificial increase in prices	Keh (1996) p.5, Alldridge (2002) p.314, FATF (2007)
5. Unfair competition	Mackrell (1997), McDowell (2001), Walker (1995)
6. Changes in imports and exports	Baker (1999) p.33, Baker (2005), Bartlett (2002) p.18-20, Walker (1995), Zdanowicz (2004b)
7. More (or less) economic growth	Aninat et al. (2002), Bartlett (2002) p.18-20, Camdessus (1998), Ferwerda and Bosma (2005), McDonell (1998) p.10, McDowell (2001), Quirk (1997), Tanzi (1997) p.92-96
8. Change in output income and employment	Bartlett (2002) p.18, Boorman and Ingves (2001) p.8, McDowell (2001), Quirk (1997), Tanzi (1997)
9. Lower revenues for the public sector	Alldridge (2002) p.135, Boorman and Ingves (2001) p.9, Mackrell (1997), McDonell (1998) p.10, McDowell (2001), Quirk (1997)
10. Threatens privatisation	McDowell (2001), Keh (1996) p.11
11. Changes in the demand for money, interest and exchange rates	Bartlett (2002), p.18, Boorman and Ingves (2001), Camdessus (1998), FATF (2002), McDonell (1998) p.10, McDowell (2001), Quirk (1997), Tanzi (1997) p.97
12. Increase in the volatility of interest and exchange rates	Tanzi (1997) p.8, McDonell (1998) p.10, Camdessus (1998) p.2, FATF (2002) p.3, Boorman and Ingves (2001) p.9
13. Greater availability of credit	Tanzi (1997) p.6, Levi (2002) p.183-184
14. Higher capital inflows	Baker (2005), Gnutzmann et al. (2010), Keh (1996) p.4, Tanzi (1997) p.6, Unger and Rawlings (2008), Levi (2002) p.183-184
15. Changes in foreign direct investment	Baker (2005), Boorman and Ingves (2001) p.9, FATF (2002), Walker (1995)
16. Risk for the financial sector, solvability and liquidity	Alldridge (2002) p.310, Aninat et al. (2002), Boorman and Ingves (2001) p.9-11, Camdessus (1998), FATF (2002), McDonell (1998) p.10, McDowell (2001), Tanzi (1997) p.98, Levi (2002) p.183-184
17. Profits for the financial sector	Alldridge (2002) p.310, Takáts (2007), Levi (2002) p.183-184
18. Reputation of the financial sector	Aninat et al. (2002) p.19, Bartlett (2002), Boorman and Ingves (2001) p.9-11, Camdessus (1998), FATF (2002), Levi (2002) p.184, McDonell (1998) p.9, McDowell (2001), Quirk (1997), Tanzi (1997) p.92-98, Walker 1995)
19. Illegal business contaminates legal business	Alldridge (2002) p.315, Camdessus (1998), FATF (2002), Levi (2002) p.184, McDonell (1998) p.11, Quirk (1997)
20. Distorting of economic statistics	Alldridge (2002) p.306, McDonell (1998) p.10, Quirk (1997), Tanzi (1997) p.96, Zdanowicz (2004b)
21. Corruption and bribery	Alldridge (2002) p.308, Bartlett (2002) p.18-19, Camdessus (1998), FATF (2002), Keh (1996) p.11, McDowell (2001), Tanzi (1997) p.92-99, Quirk (1997) p.19, Walker (1995), Levi (2002) p.183-184
22. Increase in crime	Bartlett (2002) p.18-22, FATF (2002), Ferwerda (2009), Levi

	(2002) p.183, Mackrell (1997), Masciandaro (2004) p.137, McDonell (1998) p.9, McDowell (2001), Quirk (1997) p.19, Levi (2002) p.183
23. Undermines political institutions	Camdessus (1998), FATF (2002), Mackrell (1997), McDonell (1998) p.9, McDowell (2001), Tanzi (1997) p.92-99
24. Undermines foreign policy goals	Baker (1999) p.38-39, Baker (2005)
25. Increase in terrorism	Masciandaro (2004) p.131

Not in all sources it is clear whether the effects of money laundering are described, or also (or only) the effect of anti-money laundering policy.[12]

Hardly any of the effects listed in Table 3.1 have an empirical back-up. Most of them are theorized and some even seem to have no traceable source at all. Bartlett (2002) might be a good example of this with explanations like 'it is clear from available evidence', without ever mentioning this evidence. To my knowledge, this suggested evidence simply does not exist. Empirical research on the effects of money laundering is mainly hampered by the lack of a reliable estimate of the amount of money laundering in every country in every year (Levi & Reuter, 2006, p.294). Unger et al. (2006) conclude that 'most literature on money laundering effects is pure speculation [..] one source refers to the other source, without much of an empirical solid back up'. All these effects of money laundering are in need of empirical testing. The section below describes most effects and will highlight relevant empirical studies.

Law Enforcement Agencies get a Second Chance

The direct effect of fighting money laundering is that the law enforcement agencies have a second chance to catch the criminal. The criminal that got away can reveal himself when he starts to invest the money he made from his crime. Even if the police are unable to proof the original crime, the criminal can still be convicted for money laundering, and the proceeds of the crime can be confiscated. This idea seems the reason money laundering was criminalized in the first place. When the US found out that it could not win the 'war on drugs', it decided to go after the money made from the drugs trade. In

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[12] Although this literature overview is based on an extensive literature research, its completeness can, of course, not be guaranteed. This overview is an updated version of the literature overview that has been published in Unger (2007, p.110-113).

1986, the Money Laundering Control Act was enacted, which basically started a 'war on drugs money'.

It might seem easy to get an idea how big this effect is as we have statistics on how many convictions for money laundering occurred, but it is actually more complicated. The criminals convicted for money laundering consist of two subgroups; some of them are detected while laundering their money and convicted consequently for money laundering and possibly also the predicate crime, while others are caught for the predicate crime and subsequently also or only convicted for money laundering. While the size of the former gives us an idea of how many criminals are actually caught because of the criminalization of money laundering, the latter is simply a different labeling of the crime the criminal is eventually convicted for. To make it even more complicated, it could also happen that a criminal draws the attention of the law enforcement agencies while laundering the money, but that the criminal is eventually convicted for only the predicate crime. For instance in Ireland, money laundering is often harder to proof than the predicate crime. Consequently, the authorities normally prosecute only the predicate crime, which results in low conviction rates for money laundering. Basically the opposite is true in the Netherlands, where authorities quite often only charge the criminal for money laundering to increase the chance to get the criminal behind bars[13]. Therefore, a simple analysis of money laundering conviction rates is uninformative.

Distortion of (Statistics on) Consumption, Investment, Savings, Imports and Exports, Output, Income and Employment

The criminalization of money laundering might make criminals spend their money differently (Walker, 1995). Criminals might buy or invest solely for money laundering purposes (like real estate), might not buy something because it might attract the attention of the authorities (e.g. jewelers nowadays have to report possible money laundering transactions), or buy things in a different way or at another supplier to avoid the suspicion of money laundering. When this different spending and investing pattern is

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[13] Based on interviews conducted in the EU-funded project ECOLEF, 2012.

related to foreign produced goods, it also has its effect on imports and exports. This appears to particularly be the case in developing countries (Bartlett, 2002, p. 20), where rich criminals spend their money on imported luxury goods.

But do criminals really consume significantly different than normal people? Unger (2007, p.122) did a simple comparison on spending behavior of criminals and normal people to verify this effect. Meloen et al. (2003) analyzes the spending behavior of criminals in the Netherlands, based on confiscated proceeds in 52 court cases. After comparing this spending behavior with the asset ownership of Dutch households (based on Alessie, Hochguertel & Van Soest, 2002, p. 358), Unger (2007, p. 128) concludes that 'at a first glance, the patterns seem to not be extremely diverse'. Therefore we have to expect that, at least in the Netherlands, the size of these effects is not large.

Walker (1995, p.33) uses an input output model to estimate that if A$1 million of laundered money is invested in dwelling properties rather than in more productive sectors of the economy, the Australian economy on average loses A$1.126 million of output, A$609,000 income and 25 jobs.

Artificial Increase in Prices and Unfair Competition

Holding on to illegally acquired funds is incriminating, so criminals attempt to convert them into assets (like real estate or a business) that are less conspicuous. Because of their large funds, criminals will outbid honest buyers to acquire such assets (Walker, 1995, p.33). Not only is this unfair competition, it also artificially increases prices. Keh (1996, p. 5) gives anecdotal evidence of this effect by describing land purchases by the Medellin group in the 1980s which pushed up prices from US$ 500 to US$ 2000 per hectare.

Higher Capital Inflows / Outflows and its Effects

Walker (1999, p. 25) concludes that worldwide money laundering is 'heavily concentrated in Europe and North America'. The reasons for this probably lie in the more advanced financial systems of the western world, and the fact that these countries are a good place to enjoy a luxurious life (Baker, 2005). This geographic concentration of

money laundering has its effect on capital flows worldwide. Proceeds of crime arise from all around the world and, when a large proportion of this money finds its way into the western economies, it means that it subtracts money from other parts of the world. Baker (2005, 2009) estimates that about US$ 500–800 billion flows from the developing and transitional economies into the financial systems in the west. The money laundering process thus removes a significant amount of capital (and therefore, potential development) from developing countries. He concludes that the rich are getting richer and the poor are getting poorer—as average income globally is increasing, while at the same time the number of people living below the poverty line is increasing—and suggests that this flow of capital might be one of the important reasons behind it. Baker (2005, 2009) estimates that, for every US$ 1 of foreign aid sent to developing nations by the west, US$ 10 finds its way back to the west 'under the table' by means of illicit financial flows.

Tanzi (1997) estimates the outflows of cash money from the US by calculating the difference between money printed and the money circulating in the US. This analysis led to the estimate that US$5 billion cash money was flowing out of the US in 1984. Tanzi (1997) allocates this outflow to illegal drugs trade, but one should not neglect the possibility that cash money was taken out of the US for legal reasons, such as safe investment or for the use of an alternative currency.

These unanticipated inflows and outflows of money lead to volatility in exchange rates and interest rates and directly affect the demand for money in the respective countries (Tanzi, 1996, p. 8; McDonell, 1998, p. 10; Camdessus, 1998, p. 2; FATF, 2002, p. 3; Boorman & Ingves, 2001, p. 9). It seems that the implicit assumption for these effects is that money laundering flows are irregular in size and destination. Since direct measurement of money laundering is impossible and since our estimation models so far give no indications on the size and destination over time, one can only speculate about the extent to which this is the case.

Effects for the Financial Sector

If launderers' economic behavior is less predictable than those of conventional investors, this could be a risk for the solvability and liquidity of the financial sector (Alldridge, 2002, p. 310). The literature seems to suggest that an even bigger concern for the financial sector is the effect of money laundering on its reputation. When money laundering operations are detected, the financial sector — specifically those financial institution it concerns — will lose credibility and customer confidence (Bartlett, 2002). Economic agents will consequently try to avoid these institutions due to the perceived risk of fraud and corruption associated with money laundering (Unger, 2007, p. 145-6).

Greater Availability of Credit and Changes in Foreign Direct Investment

If money is brought to a specific country for laundering, its financial institutions might have higher profits and deposits, which leads to higher credit availability, even for legitimate businesses (Unger, 2007, p.140). The reputation of being a country with high money laundering inflows however can have a detrimental effect on foreign direct investment (Boorman & Ingves, 2001, p. 9).

Although it is not the result of published scientific research, it might be worthwhile to discuss here also another observation, namely that money launderers might have even saved banks. In an interview with the Observer (December 13, 2009) Antonio Maria Costa (head of the United Nations Office on Drugs and Crime) stated drug money saved our banks during the financial crisis. When banks stopped lending money, drug money was the only liquid investment capital available. Costa has seen evidence that € 238 billion worth of drug money was laundered during the financial crisis. Adding these amounts of money during financial downtimes actually stabilizes financial markets. Unfortunately, the evidence Costa speaks of has never been made publicly available and therefore not assessable.

Increases in Crime

Money laundering could increase crime. Money laundering makes criminal activities worthwhile and provides criminal organizations with capital they can use to further expand their criminal activities (Mackrell, 1997).

Masciandaro (1999) constructs a theoretical model that shows that money laundering can work as a multiplier increasing crime over time. (see Chapter 2 for a description of this model) Ferwerda (2009) estimates the effect of anti-money laundering policy on other crimes. If governments succeed in making money laundering difficult, then becoming a criminal will be less attractive[14] since it will be harder to enjoy the ill-gotten gains – even when the crimes that are committed result in large gains and are not detected. Therefore anti-money laundering policy might not only decrease money laundering, but also crime in general. This research – which is shown in Chapter 4 of this dissertation – suggests that anti-money laundering policy can be used to reduce crime levels, and that especially more intense international cooperation in the fight against money laundering is associated with lower crime rates. This result is in line with the idea that we can make crime less worthwhile by fighting money laundering.

The Effect of Money Laundering on Economic Growth

Money laundering can dampen economic growth, because of all the above mentioned effects, like its damaging effect on financial institutions (Tanzi, 1997, p.96), distorted investments and facilitation of crime and corruption (Bartlett, 2002, p. 1).

Quirk (1997) used the widely respected economic growth model of Barro (1991) to estimate the effect of money laundering on economic growth. Quirk changed Barro's growth model by replacing the human capital variable with a money laundering variable. As he had no estimates of money laundering, he used countries' crime levels as a proxy variable instead. This led him to basically not estimate the effect of money laundering

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[14] How AML policy influences the incentives of (potential) criminals is modeled in Ferwerda (2009), one can use this model to show algebraically that anti-money laundering policy reduces crime.

specifically, but the effect of crime in general. Quirk found that money laundering (actually crime) dampens economic growth.

Ferwerda & Bosma (2005) did a follow-up study on the work of Quirk. They also estimated the effect of money laundering on economic growth based on Barro, but used six different actual estimates of money laundering for 17 countries, all based on the Walker model and the adjusted Walker model.[15] To test the robustness of Quirk's results, the crime level was also used as a proxy for money laundering. It turned out that the result found in Quirk (1996) — that money laundering dampens economic growth — was consistent with Ferwerda & Bosma's study. Higher values in the six different estimates of money laundering and the crime rate were all associated with lower economic growth rates.

Since Ferwerda & Bosma had estimates of crime *and* money laundering, they were able to estimate their effects separately[16]. Their research showed that while money laundering itself does not dampen economic growth, the crime that is intermingled with it does. Hence, it might not be the actual capital flow from money laundering that is hurting the economy, but the criminals that might follow this money.

3.3. Conclusion

The literature mentions many effects of money laundering, but the empirical back-up of these effects is still largely missing. 'The cost of compliance is increasing rapidly but it would be a brave person who steps up to say that it is too high a price to pay for countering terrorism and serious crime' (Whitehouse, 2003, p. 144). Now that we have been brave enough to doubt the cost-effectiveness of anti-money laundering policy, it is time for some serious research to find out how real these effects of money laundering really are. The literature presents us that money laundering can dampen our economic

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[15] Walker pioneered estimating the amount of money laundering worldwide, see Walker (1995, 1999). His model was modified by Unger et al. (2006 and 2007). Chapter 2 of this dissertation discusses the Walker model and the modification of Unger.

[16] The money laundering estimations that Ferwerda & Bosma (2005) used are from the estimation models of Walker (1995 and 1999) and Unger et al. (2006 and 2007). The methodological problem that we should highlight is that one of the main inputs of these estimation models is crime, which could hurt the pureness of estimations of Ferwerda & Bosma (2005) that include crime and money laundering simultaneously.

growth, destabilize our financial system and increase the general crime level. If anti-money laundering policy would counter all of this, it could easily pay for itself. As long as we are unsure to what extent this is the case, the cost-effectiveness of this world-wide policy can never be determined. So effectively, at the moment we leave the public in the dark on whether their tax-money is well spent on anti-money laundering policy.

Chapter 4. Does Anti-Money Laundering Policy Reduce Crime?[*]

4.1. Introduction

Since crime is on the top of many nations' domestic policy agendas, there is a need for a body of policy-relevant knowledge about crime, for theoretical ideas and empirical findings that can be translated into public debate and relevant policies (DiIulio, 1996, p.3). Reviewing the empirical literature on money laundering, Unger (2006, p.102) concludes: "Most literature on money laundering effects is pure speculation. Some of the literature refers to estimates without ever mentioning the source. [..] Furthermore, [..] one source refers to the other source, without much of an empirical solid back up." This chapter tries to add a theoretical and empirical insight on the effects of (the fight against) money laundering to the current literature.

The chapter starts with creating a theoretical model which describes how the criminalization of money laundering has a negative effect on the crime rate. The starting point of this theory is the 'economics of crime,' which explains criminal behaviour under the assumption of rational choice (see Bentham, [1788] 1843; Becker, 1968; and, for a good overview of the literature on this research area, Eide, 2000; Polinsky and Shavell, 2007). Extending this model by including the effect of money laundering shows that anti-money laundering policy deters potential criminals to commit not only the illegal act of laundering money, but crimes in general.

Extensive data on anti-money laundering policies that can be used for a cross-country analysis is still missing at the moment. This chapter therefore develops an indicator based on all the available information on anti-money laundering policies in the mutual evaluation reports of the Financial Action Task Force (FATF), which results in a unique

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[*] This chapter is based on Ferwerda, J. (2009) The Economics of Crime and Money Laundering: Does Anti-Money Laundering Policy Reduce Crime?, published in *Review of Law and Economics*, special issue: Tackling Money laundering, Vol. 5, Iss. 2, Article 5, p.903-929. Although it is published in a special issue, the standard Review of Law and Economics double blind referee process has been applied.

indicator that encompasses several aspects of anti-money laundering policy. The creation of this indicator makes it possible to test the suspected and guessed effects of money laundering (policies), which is needed (DiIulio, 1996, p.3) and lacking (Unger, 2006, p.102) in the current literature. The final part of the chapter tests whether the hypothesis of the economics of crime on money laundering can be confirmed econometrically.

4.2. The Economics of Crime

English philosopher Jeremy Bentham ([1788] 1843, p.399) first mentioned the idea of the economics of crime:

"The profit of the crime is the force which urges man to delinquency: the pain of the punishment is the force employed to restrain him from it. If the first of these forces be the greater, the crime will be committed; if the second, the crime will not be committed."

This idea, which later became known as 'the economics of crime,' was used and modernized by Gary S. Becker in 1968. His paper suggests that governments should develop a policy system where 'crime does not pay.' It is the task of the government to assure that the costs of committing each offense (the chance of being caught multiplied by the amount of punishment), are higher than the benefits of each offense. If this is the case, the punishment will deter the criminal from committing the specific offense. This follows the economists' usual analysis of choice and assumes that a person commits an offense if the expected utility exceeds the utility he could get otherwise. Some persons become 'criminals,' not because their basic motivation differs, but because their benefits and costs of crime differ (Becker, 1968, p.176). So whether a person will perform a specific criminal act or not depends on his probability of conviction (p_j), on his punishment if convicted (f_j); and on other variables, such as income potentially available to him in legal and other illegal activities, the frequency of nuisance arrests, and his willingness to commit an illegal act. Becker (1968, p.177) describes the expected utility of committing an offense as:

$$EU_j = p_j U_j (Y_j - f_j) + (1 - p_j) U_j (Y_j)$$

(4.1)

with EU_j as the expected utility from committing an offense, U_j as a utility function and Y_j the income, monetary plus psychic, from committing an offense. This means that a higher probability of conviction and a more severe punishment would lower the expected utility as long as the marginal utility of income is positive (Becker, 1968, p.177). For the step from this micro perspective to the macro perspective, Becker understands the differences between persons in the determinants p, f and u,[17] but considers only their averages for the sake of simplicity. This means that we can explain the amount of offenses (O) in the market with the following reduced form, called the 'market offense function';

$$O = O(p, f, u)$$

(4.2)

So the amount of crime decreases when the probability of conviction goes up or when local governments punish criminal behaviour more severely.

Since Becker presented his model of the economics of crime, several hundred articles have been written on this subject (e.g., see the references cited in Bouckaert and De Geest, 1992, p.504-526; Garoupa, 1997; Mookherjee, 1997; and Polinsky and Shavell, 2000, from Polinsky and Shavell, 2007, p.405). This literature addresses a broad spectrum of relevant and interesting questions,[18] but only the applications and extensions which are relevant for the theoretical model presented below are discussed in this chapter.

Although the offense function derived by Becker is more an assumption than a result, many empirical papers have tried to test the relation between the crime level and the probability and severity of punishment. Eide (2000, p.360) concludes, after an extensive review, that the empirical studies in this field indicate a negative association between crime and the probability and severity of punishment, and that this result may be regarded as a confirmation that an increase in the probability or severity of punishment

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[17] u are all other influences determining the expected utility of crime.
[18] Questions like: Should the sanction be a fine or imprisonment or a combination? Should there be a strict liability rule or should this be fault-based? How should the sanction level be adjusted to the probability of being caught (Polinsky and Shavell, 2007:405)?

will decrease the expected utility of criminal acts and thereby the level of crime. This empirical evidence exhibits consistency across different methodological approaches (Levitt and Miles, 2007, p.489). Also evidence from the criminological literature supports the idea that a high likelihood of sanction reduces the chance that individuals will offend (Levitt and Miles, 2007, p.461).

The economics of crime research area models the effects on crime in general. With the recent expansion of the types of crime, more specifically the development of financial crimes like money laundering, the economics of crime should be extended to the 'economics of crime and money laundering.'

4.3. The Economics of Crime and Money Laundering

Since money laundering is an illegal act, and the only way to be able to use one's ill-gotten gains in the legal economy, it is necessary to commit two criminal acts (each with its own probability of conviction and sentence) in order to profit from criminal behaviour: the crime itself and the laundering of the proceeds of crime.[19] So a criminal faces two instances of probable conviction and two different potential punishments. When an individual commits a crime to profit from it, he faces the risk of being caught (p) and punished (f_o). However, when he cannot use his profit without laundering it, he faces additionally the risk of being caught (q) and punished for laundering money (f_{ml}), combined with facing the risk of conviction for committing the original crime (z).[20] In addition to this, each money laundering operation implies aggregate transaction costs (tc), represented by the resources that a criminal needs in order to put the money laundering process into action. On the one hand, we have technical costs related to the adopted money laundering technology; and on the other hand, we have costs due to anti-money

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[19] In practice not all of the proceeds from crime have to be laundered. For simplicity it is assumed that this is incorporated in the probability of conviction for money laundering (q), which can be zero if the initial offense is not a predicate crime for money laundering and will reduce the model to the original model of Becker (1968).

[20] Police forces now try to convict the criminal not only for the act of money laundering, but they also try to prove the original act, which is in most cases already necessary to prove the act of money laundering. Not all criminals launder the money themselves. Not laundering the gains from a criminal act yourself normally leads to higher transaction costs, but a lower chance of being caught, both for money laundering and for the original crime. A criminal with ill-gotten gains faces a trade-off here, and although this is an interesting part of the decision-making process of a criminal, this is not incorporated in detail in the model.

laundering regulation. The costs of money laundering will therefore depend on the effectiveness of anti-money laundering regulation: the more effective, the more expensive it will be for criminals to undertake the activity of money laundering. The two types of costs may obviously be related in a more or less significant fashion (based on Masciandaro, 1999, p.227). All four factors (q, f_{ml}, z, tc) described here are negatively related to the expected utility from illegal behaviour – in more or less the same fashion as in the original Becker model – which means an increase in one or more of these factors will decrease the crime rate. In Appendix 4.1, this intuition is modelled and the negative relations are shown using algebra.

Some considerations and extensions of the original Becker model are also applicable to the economics of crime and money laundering presented above. One of the extensions of the original model is to focus not only on the decision to commit the criminal act, but also on the activity level of illegal behaviour (Polinsky and Shavell, 2007, ch.14). This consideration might be of particular relevance when the economics of crime analysis is extended to money laundering, since the activity level of money laundering has a major effect on the chance of being caught. For example, in the United States unusual transaction reports are filled in only for transactions exceeding 10,000 dollars. This means a potential money launderer who is not deterred from laundering money can be deterred by anti-money laundering policy to launder more than 10,000 dollars. This means the anti-money laundering policy does not have an effect on the money laundering decision, but on the activity level of money laundering. Although an interesting effect, this is not considered in the model presented in this chapter. The exclusion of this effect does not change the result of the model, though, since a decrease in the activity level of a money launderer will increase the transactions costs of money laundering and therefore yields the same result on the crime level.

Another consideration for the theoretical model presented in this chapter is that potential criminals might consider several criminal acts and are deterred from committing only certain illegal acts, which results in making them commit other criminal acts (Polinsky and Shavell, 2007, ch.18). This so-called marginal deterrence effect might be applicable here, since anti-money laundering policy could deter criminals from laundering

their money, forcing them to invest their ill-gotten gains back into the illegal sector where money laundering is not needed. This might in fact increase the amount of crime, instead of decreasing it. Unfortunately it is not possible to address this interesting trade-off in this chapter, although this is definitely an interesting effect of anti-money laundering policy.

4.4. Crime Data

Since crime is, by definition, an illegal act, it is likely that every method used to measure the actual amount (or level) of crime is inaccurate. "Data on the extent and variety of criminal activity pertain almost exclusively to crimes in which victims report the offense to authorities" (Levitt and Miles, 2007, p.458). This limitation also constrains the empirical part of this chapter.[21] There are many kinds of crime statistics, but basically they can be divided into two groups: police-recorded and based-on-victim surveys. The first is the amount of crime detected by the police or similar law enforcement agencies. The most reliable sources for this kind of data are the European Sourcebook of Crime and Criminal Justice Statistics and the crime statistics gathered by Interpol and the United Nations. The latter, victim surveys, are statistics that are gathered by interviewing households or individuals trying to detect the victims of crime. The most reliable statistic of this kind is the International Crime Victims Survey (ICVS).

Both kinds of data have their advantages and disadvantages. Police-recorded crime statistics are often readily available, are reliable in terms of the right classification of the crime, and are not biased by the perceptions of individuals. The downside is that these crime statistics are only measuring the amounts of caught crime, which means that crime is always underestimated. However, this will not hurt the empirical research if the rate at which actual crimes are reported is constant across countries and years. This seems an implicit assumption in most studies in this research field (Eide, 2000, p.366). The crimes that are considered of minor relevance by the police (officers) might be underestimated

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[21] In fact, the crime rates used in this chapter are the total number of (unweighted) criminal offenses per 100,000 inhabitants in the years 1995 till 2000. "Criminal offenses in this pragmatic sense include acts, which are normally processed by the public prosecutor or a judge, whereas offenses processed directly by the police, such as minor traffic offenses and certain breaches of public order, are not included" (WODC, 2003, p.252).

even more, because there is less attention for these crimes. Therefore, the differences in these crime statistics (across years or geographical space) might be the result of differences in productivity of the law enforcement agencies, instead of differences in the real amount of crime.

In victim surveys, the productivity of the law enforcement agencies does not influence the statistics. The downside of victim surveys is that people are asked whether they have been a victim of a crime in a certain period, while evidence that these crimes actually occurred is not needed. This runs the risk that what is measured is not the actual amount of crime, but the perceived amount of what is believed (by the interviewed) to be crime. For my research the two most striking problems are that the measured crimes are not at all the crimes which are normally related to money laundering and these statistics are much less available than the police-recorded crime statistics.[22]

My conclusion is that for this research, police-recorded crime statistics are the best possible proxy for crime, because of its better availability and because it includes more crimes that are relevant for money laundering,[23] which is in line with most of the studies in this research field (Eide, 2000, p.366). For this research, the European Sourcebook of Crime and Criminal Justice Statistics is used, since it has comparable data on almost all of the countries in the dataset.[24] The selected countries are all developed countries, with many of them in the same region (Europe). It is assumed that this reduces the bias of

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[22] ICVS has traditionally focused on crimes against individuals and households, and doesn't have much to say about buyer-seller crimes like drug trafficking and product counterfeiting, or about crimes against businesses, including fraud and insider trading. I owe this point to John Walker, CEO of Crime Trend Analysis, one of the world's leading crime trend experts.

[23] One can consider whether all crimes or only property crimes should be used. With respect to the theoretical model presented in this chapter, it seems best to use the predicate crimes of money laundering as a guideline. The crimes which are, according to the FATF (2003, p.12), predicate crimes for money laundering are: participation in an organized criminal group and racketeering; terrorism, including terrorist financing; trafficking in human beings and migrant smuggling; sexual exploitation, including sexual exploitation of children; illicit trafficking in narcotic drugs and psychotropic substances; illicit arms trafficking; illicit trafficking in stolen and other goods; corruption and bribery; fraud; counterfeiting currency; counterfeiting and piracy of products; environmental crime; murder, grievous bodily injury; kidnapping, illegal restraint and hostage-taking; robbery or theft; smuggling; extortion; forgery; piracy; and insider trading and market manipulation. It therefore seems best to use total crime rates in this study.

[24] To obtain a balanced panel, the missing values are interpolated partly by using statistics on different years of the same country and partly by using UNODC crime statistics, which are comparable to some extent.

differences in productivity of law enforcement agencies, though differences among different law systems within Europe might prevail.[25]

4.5. Data on Anti-Money Laundering Policy

The specific values of the chance of being caught for money laundering (q) and the predicate crime (z), the average sentence for money laundering (f_{ml}) and the transactions costs (tc) are at the moment not well documented or available. To be able to test the theoretical model above (the economics of crime and money laundering), it is assumed that a stricter anti-money laundering policy simultaneously increases the probability of conviction for money laundering, the penalty for convicted money launderers, the probability that the money launderer will also be convicted for the predicate crime, and the transaction costs of money laundering[26] (as done by Masciandaro, 1999, p.227).[27] The relation between anti-money laundering policy and crime is shown in Figure 4.1.

Figure 4.1. The indirect relation between anti-money laundering policy and crime
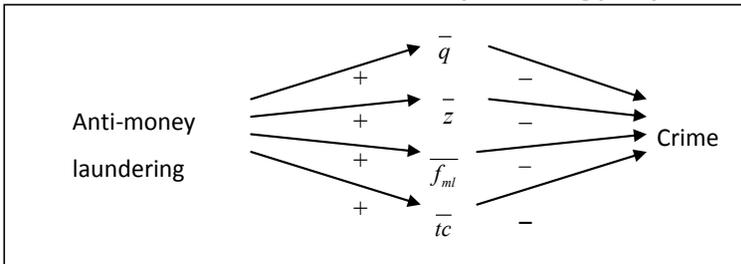
A positive relation between anti-money laundering policy and the four important deterrents for laundering money is assumed, while a negative relation between these deterrents is shown – respectively from top to bottom – by equation (A2.3), (A2.4), (A2.6) and (A2.7) in Appendix 4.1.

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[25] This difference has been controlled for as much as possible by including control variables on the rule of law, enforcement and corruption control.

[26] One of the challenges to the empirical study of the criminal enforcement system, according to Levitt and Miles (2007:478), is that "the models often lack wider application and are tailored to the particular data set that a researcher possesses." Since it seems reasonable to expect that data on these variables will be available in the near future (e.g., the EU Sub-working Group on Collecting Statistical Indicators of Anti-Money Laundering Policy is collecting cross-country comparable anti-money laundering data for the European Union) a specific application of a general model is tested in this chapter instead of a model tailored to the used dataset.

[27] The use of proxy variables instead of the actual variables is typical in empirical estimations of (extensions of) the economics of crime (Levitt and Miles, 2007:457).

So far the deterrents for money launderers are measured by specific indicators: low bank secrecy laws (see Walker, 1999; Unger, 2006), SWIFT membership (see Walker, 1999; Unger, 2006), Egmont Group membership (Unger, 2006), and/or blacklisted countries by the FATF (see Masciandaro and Portolano, 2002). In order to avoid the use of a single indicator, all the available information on the anti-money laundering policy of a country from the mutual evaluation reports of the FATF, IMF and World Bank is used (FATF, 2002-2006). This gives a unique indicator which encompasses all of the different aspects of anti-money laundering policy.

In response to an increasing concern over money laundering and the threat to the banking system and financial institutions, the FATF had to develop, adopt and implement measures to counter money laundering. In 1990 the FATF implemented a series of forty recommendations[28] that governments should make use of to ensure that effective anti-money laundering programs are in place. However, not all countries are members of the FATF, and therefore the forty recommendations were not implemented globally until 2001, when they were executed by the IMF and the World Bank. With their global membership the IMF and World Bank could assure a more uniform and widespread application of the recommendations, unlike the FATF with its voluntary membership (Arnone and Padoan, 2006).

The FATF's forty recommendations should, if fully implemented, provide a country with a complete framework for successfully combating money laundering. These recommendations include, amongst others, the definition of money laundering and the predicate crimes for laundering, the sectors that should be monitored more intensely, and the regulatory institutions and international co-operation needed.[29]

When conducted in the same way, with the same rules, these assessments are a good way to develop an indicator on the degree of anti-money laundering policy in a certain

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[28] Although the fight against terrorism financing is also included in this document with the nine special recommendations, this chapter will concentrate solely on combating money laundering.

[29] This short description provides an extreme simplification of the recommendations. For the complete text of each, see the forty recommendations published by the FATF on its website or see the short description of the recommendations in appendix 4.2.

country. However, the analysed assessments differed in quality, shape and size. The length of the reports differed from 14 pages for Germany to 361 pages for France. There were assessments that used an old style of reporting, and there were assessments according to the new style of reports, called the detailed assessments. As Arnone and Padoan (2006) concluded: "As a result of the way the assessments were made and even their layout, the assessments differed widely in quality, content, layout, and even across institutions and countries, making it very difficult to make sensible cross-country comparisons and analysis."

The FATF's procedure is to assess countries on the degree of compliance with the forty recommendations. These assessments are public and are published as mutual evaluation reports on the FATF website or on the websites of FATF-style regional bodies.[30] These assessments include a full description of the way a country tries to combat money laundering and, in later versions,[31] a table with scores for these forty recommendations. These scores vary between fully compliant (FC), largely compliant (LC), partly compliant (PC) and not compliant (NC), and include the possibility of a not applicable (NA) score. A table such as this gives a good overview of the strengths and weaknesses of the anti-money laundering policy of each country. When evaluating these scores, the FATF takes the financial possibilities of that specific country into consideration. This means that the same policy could be assessed as an LC for a developing country, while it is assessed as a PC for a developed country.

The problem with this method of evaluation is that the scores are not comparable across countries. In the past, countries took the initiative to compare themselves to others. Cyprus, for instance, compared its anti-money laundering and terrorist financing framework with eight other countries: Australia, Belgium, Hungary, Ireland, Norway, Slovenia, Sweden and Switzerland. Based on the scores of the mutual evaluation reports of the countries, Cyprus found itself on the top of the list, as the most compliant country.

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[30] There are nine FATF-style regional bodies which represent nine different regions; AGP (Asia/Pacific Group), CFATF (Caribbean FATF), Council of Europe (MONEYVAL, Eastern Europe), EAG (7 Asian countries), ESAAMLG (Eastern and Southern Africa), GAFISUD (Latin America), GIABA (Western Africa), MENAFATF (Northern Africa and the Middle-East) and OGBS (13 small islands and Panama).

[31] A new method including a table with scores was first described in February 2004; FATF (2004).

The country proudly declared these results as "a comprehensive response to the various unfounded adverse criticisms aired from time to time against Cyprus" (Central Bank of Cyprus, 2006). This comparison, however, is not valid because of the differences between countries in their economic capacity to combat money laundering.

Although all of the information on the degree of anti-money laundering policy is available in the mutual evaluation reports, the construction of a good indicator for anti-money laundering policy that can be used "to make sensible cross-country comparisons and analysis" (Arnone and Padoan, 2006) cannot be achieved by a simple calculation. To come up with the best possible indicator on anti-money laundering policy, the creation of a database that includes all the relevant information that one can find in the mutual evaluation reports is needed.[32] Because the various recommendations differ so much and because there is room for different interpretations of the recommended action(s), the creation of a database started with developing six broad categories, which can be applied in general for attributing scores from 0 to 5.[33]

> 0 = No policy or action performed
> 1 = Only some policy or action performed / an attempt has been made
> 2 = Still a lot to be done
> 3 = Some problems or some sectors uncovered
> 4 = Minor shortcomings / considerations for improvement
> 5 = Comprehensive implementation

The NA (not available) score, which was possible in the traditional FATF detailed assessments, has been excluded from the database. This makes calculations involving the scores less cumbersome and is more useful for scientific research.

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[32] I am aware of the fact that the reports are still in their infancy. In 2005, the IMF evaluated 23 reports with regard to their overall quality, deficiencies in description/analysis, recommendations and ratings and found that 48% of the recommendations and 49% of the ratings contained material with serious deficiencies. This means that there is still a long way to go in order to assess countries' anti-money laundering activities properly. There is hope that the efforts of the IMF and FATF will improve the quality of the mutual evaluation reports in the future, since they play an important role in the international fight against money laundering nowadays.
[33] It is worth mentioning that some recommendations have a deviant character, which means that in case the wording cannot be applied literally, a somewhat freer interpretation of the general index is needed.

After creating this index, the entire mutual evaluation reports for all of the different countries[34] were assessed. For each country, scores were applied to all 40 different recommendations and it was noted exactly which comments and phrases made that specific score reasonable.[35] Using this method, a database was created with a score for each country and each recommendation, including the argument(s) as to why this score was chosen and a reference to the source of the argument(s) in the mutual evaluation report. Table 4.1 shows, as an example, the first part of the database, which includes 680 scores with arguments why these scores are attributed.[36]

Table 4.1. The Construction of the Database

ISO	R	F	Final score is based on:
AUS	1	4	(7) Predicate offenses include all indictable offenses (8) Criminalized at state and territory level, and these offenses vary in comprehensiveness
AUT	1	3	(120) Palermo not implemented and ratified (Table 10 - sentence 3) Raise penalty level for simple ML offenses
BEL	1	5	(7) Ok
DAN	1	4	(Table) Greenland and Faroe not fully consistent, range of predicate offenses not adequate
FRA	1	5	(149) Palermo + Vienna implemented, Criminalization extensive
GER	1	5	(6) Criminalized on basis of Palermo and Vienna
GRE	1	2	(140) Expand ML to all serious offenses and dual criminality
IRE	1	5	(7) Broad ML offense (prosecution + conviction level remain low)
ITA	1	5	(In text and table no indications for deduction of points have been found)
LUX	1	2	(7, Table 2, 22) Palermo not ratified, scope too limited
NLD	1	4	(113) Palermo not implemented
NOR	1	4	(4) Minor enhancements should be made regarding self-laundering and conspiracy

Source: Constructed by Ferwerda and Bosma in 2007. ISO = ISO country code, R = Recommendation number and F = Final score (paragraph or table numbers where the argument is found are given in parentheses) [37]

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[34] There are 17 countries in the sample: Australia, Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom and the United States of America. This selection is based on the availability of mutual evaluation reports, the availability of (comparable) crime data and because money laundering worldwide is "heavily concentrated in Europe and North America" (Walker, 1999:25)

[35] The application of scores based on text is always subject to interpretation, which could result in measurement errors. To reduce this to the minimum, the final score was based on a discussion between two researchers who had applied a score separately, which means that if one came up with a 5 and the other with a 3, this did not mean that the final score automatically became 4. In principle, it could actually happen that the final score was 0 (Ferwerda and Bosma, 2007).

[36] Since the arguments for every score were included in the database, it was possible to ensure consistency of the applied scores by analyzing the scores of each recommendation afterwards.

[37] I am grateful to Silvester Bosma for allowing me to use the database that we created together.

The entire table with all scores attributed according to the process described above immediately gives an indication which country has the most comprehensive and complete anti-money laundering framework. It also reveals exactly which of the forty recommendations a country is less compliant with and why. For a detailed analysis of the results of this evaluation process, see Unger and Ferwerda (2009). Arnone and Padoan (2006) evaluated the method described above by comparing its results with the figures that they found when using the scores in the detailed assessments (these are the FATF scores, which are quantified by Arnone and Padoan). Because their figures are based on the detailed assessments, only six of the 17 countries could be compared; for the other countries there were no detailed assessments available. They have figures for only the following countries: Australia, Belgium, France, Ireland, Italy and Sweden.[38] From the aggregated scores of the different countries Arnone and Padoan (2006) conclude that "the results are very similar." In both rankings, France and Belgium are the best performers and Australia and Sweden the worst, leaving Ireland and Italy in the middle. The difference in ranking is that Ireland and Italy are switched in order, just like Australia and Sweden. However, both scales are so close to each other that they appear almost indistinguishable.

The recommendations have been divided into four different anti-money laundering policy areas in order to be able to identify the effects of the different policy areas: legal, private sector, public sector and international cooperation.[39] The policy area 'legal' covers the aspects of the legal system of a country, such as the criminalization of money laundering, the criminal liability of legal entities and the ability to confiscate criminal proceeds.[40] The 'private sector' part of anti-money laundering policy includes mainly the

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[38] This was true at the time of the analysis; in the interim this number has increased, and could increase even more in the future.

[39] The score for every policy area is the sum of all the applicable recommendations; this means that the same importance is assumed for every recommendation. This is not true per se; it could be that some recommendations are more important or that a combination of some recommendations is needed for an effective anti-money laundering policy. It could also be that the chain is only as strong as its weakest link and that neglecting one specific recommendation could destroy the entire anti-money laundering effort. However, as a first step it seems reasonable to assume that all recommendations are of the same importance. Weights can be attributed at a later time, once more is known about the interaction of the recommendations.

[40] The score for this policy area is the sum of the scores for recommendations 1-4.

duties (especially reporting) of private companies, such as financial institutions and 'designated non-financial businesses and professions.'[41] The category 'public sector' includes the institutional set-up needed for the fight against money laundering, such as the establishment of a financial intelligence unit, regulation, and supervision.[42] 'International cooperation' in the fight against money laundering includes, among others, implementation of different conventions, mutual legal assistance, and extradition.[43] The scores on these policy areas for the 17 countries in the dataset are shown graphically in Figure 4.2. This figure is included to show the variation in the different policy areas between countries, and is not discussed in full detail in this chapter. We can see that there is more variation between countries in the 'legal framework' and 'duties of the private sector,' compared with the variation between countries regarding the 'institutional framework' and 'international cooperation.' The effect of the different policy areas is estimated separately, which makes only the variation within a policy area important for the empirical result.

Figure 4.2. The percentage of compliance by anti-money laundering policy areas
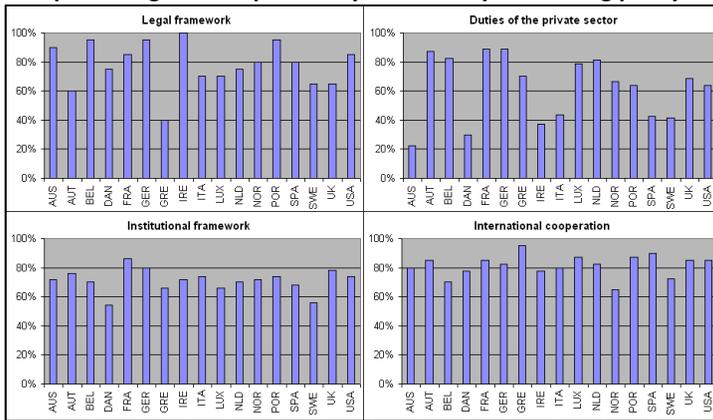
Source: calculated by the author. Since the number of recommendations differs for every policy area, percentages are used. There are, for example, four recommendations on the legal aspects of anti-money laundering policy, and therefore the best possible score is 20, so the United States has 85% compliance with this policy area with 17 points out of 20.

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[41] The score for this policy area is the sum of the scores for recommendations 5-13, 15-18, 23-25, recommendation 14 and 20 are dropped due to hardly any/no variation in the scores for the 17 countries included in the dataset.

[42] The score for this policy area is the sum of the scores for recommendations 19 and 26-34.

[43] The score for this policy area is the sum of the scores for recommendations 21, 22 and 35-40.

4.6. Control Variables

Four control variables are selected to enter the estimation equation, to prevent the possibility of an omitted variable bias. This section presents the sources of these control variables, and the motivation to include each of them in the estimation equation.

The effect of development (normally measured by income) on crime is analysed frequently in the literature. Studies find both positive and negative effects; see, e.g., the literature review of Soares (2004), which compares 23 different studies on this ambiguous effect. Since the development level of a country also affects the extent to which it is possible for a country to implement suitable anti-money laundering policies,[44] we want to control for the economic differences between countries in the estimated equation. In this chapter development is also measured by income, more specifically: GDP per capita. To correct for the non-normality characteristics of the data,[45] a logarithm of the variable is used, which is a standard way to cope with this problem. The yearly data on GDP per capita is retrieved from Penn World Table (Heston, Summers and Aten, 2002).

One critique of the mutual evaluation reports of the FATF, IMF and World Bank is that only compliance with law in the books is evaluated and not law in action. For anti-money laundering policy, it is not apparent in the literature how law in action relates to law in the books, but since enforcement in general is assumed to be related to (registered) crime levels, it seems wise to control for that effect. The variable used for enforcement is the index of public enforcement on self-dealing developed by Djankov et al. (2005) that concerns whether all disclosure and approval requirements have been met. The index ranges from 0 to 1, with one-quarter point for the presence of each of four different types of fines.

Another indication for the degree of law in action is corruption, since it is harder to implement effective laws in countries with high corruption levels. The effect of corruption

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[44] The FATF, IMF and World Bank seem to share this view, since the scores in the mutual evaluation reports are corrected for the economic capacity of the evaluated country.
[45] Table A4.2 in Appendix 4.3 shows that GDP p/c data has, as expected, a high (and the highest) skewness and kurtosis.

on money laundering is ambiguous at the moment. Walker (1999) argues that corruption puts money launderers at risk to lose their money and therefore deters money laundering, while one can also argue that some degree of corruption makes the illegal act of money laundering easier and therefore attracts money laundering. To control for these effects, a variable on the degree of corruption is included in the estimation equation. Since this data is not available on a yearly basis, a time invariant level of corruption is used – the average corruption score in the Worldwide Governance Indicators project of the World Bank[46] over the years 1996 through 2000.

One might expect that the better protection of property rights in common law countries would lead to stronger efforts to combat crime and therefore to lower crime rates (Spamann, 2009) and to a more intense anti-money laundering policy. The estimation equation might suffer from an omitted variable bias when the legal origin of a country is not taken into account. A dummy variable for common law countries will therefore enter the estimation equation as a control variable. Four out of the 17 countries analysed in this chapter have an English legal system origin; Australia, Ireland, United Kingdom and the United States.[47]

Table A4.2 in Appendix 4.3 presents the descriptive statistics of all of the variables that enter the estimation equation.

4.7. Empirical Results

Since the number of countries is limited, panel data is used for the empirical estimation. In general, the proposed estimation model will look like

$$y_{ct} = \beta_0 + \beta x_{ct} + \alpha_c + u_{ct} \qquad (4.3)$$

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[46] The data of and the information on the Worldwide Governance Indicators project of the World Bank is available online at http://info.worldbank.org/governance/wgi/index.asp.

[47] See, e.g., the CIA World Fact Book, available online at https://www.cia.gov/library/ publications/the-world-factbook/.

where $\alpha_c + u_{ct}$ is treated as an error term consisting of two components: an individual (country) specific component that is time invariant, and a remainder component, which is assumed to be uncorrelated over time (Verbeek, 2008, p.364). The first important question is whether this estimation model is relevant. This is tested with the Lagrangian multiplier test for random effects proposed by Breusch and Pagan (1980) with the null hypothesis that the variation of α_c is zero (i.e., that the random effects model is irrelevant). Since the null hypothesis of the test is rejected[48] in this case, we can conclude that it is relevant to use the random effects model instead of using the normal OLS estimation model.[49] The second question is whether we should use fixed effects to correct for the correlation between α_c and x_{ct} or whether we could use the more efficient random effects model, which is only consistent when α_c is uncorrelated with x_{ct}. A test for the null hypothesis that α_i and x_{it} are uncorrelated is the Hausman (1978) test. In this model the null hypothesis cannot be rejected,[50] which means that we can estimate the more efficient random effects model consistently. To be able to estimate the effect of the time invariant variables (especially the variables of interest on anti-money laundering policies), a Mundlak (1978) specification is used. In practice, this means that the average of all of the time varying variables is included in the estimation to deal with the correlation between the country specific variables and all other right-hand side variables. The parameters of the Mundlak specification are the same as the random effects model with the same variables, but have lower standard errors.

As outlined above, the estimation will consist of a time varying dependent variable (crime) and independent variables which are time invariant (anti-money laundering policy and three control variables) and time variant (GDP per capita). This brings us to the following estimation model:

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[48] The result of the test was a Chi-squared of 232.47, which equals a probability of 0.00. We therefore reject the null hypothesis on a 5% (and 1%) confidence interval.
[49] The results of the pooled-OLS estimation model are shown in Column 1 of Table 4.3.
[50] The result of the test was a Chi-squared of 0.08, which equals a probability of 0.77. We are therefore not able to reject the null hypothesis on a 5% (or 10%) confidence interval.

$$Crime_{ct} = \beta_0 + \beta_1 Legal_c + \beta_2 Public_c + \beta_3 Private_c + \beta_4 International_c + \beta_5 Corruption_c$$
$$+ \beta_6 Common\ law_c + \beta_7 Enforcement_c + \beta_8 \log(GDP\ p/c)_{ct} + \beta_9 \log(GDP\ p/c)_c + U_{ct}$$

<div align="right">(4.4)</div>

where $Crime_{ct}$ is the total crime rate of country c at time t, $Legal_c$ is the legal framework to fight money laundering, $Public_c$ is the institutional framework to fight money laundering, $Private_c$ is the duties of the private sector to fight money laundering, $International_c$ is the international cooperation to fight money laundering, $Corruption_c$ is the degree of control of corruption, $Common\ law_c$ is a dummy variable for common law countries, $Enforcement_c$ is a public enforcement index, $Log(GDP\ p/c)_{ct}$ is GDP per capita, $Log(GDP\ p/c)_c$ is the average GDP per capita and U_{ct} is the error term for panel data.

One might suspect the problem of multicollinearity here, since the different policy areas can be highly correlated. Therefore the correlation matrix (Table 4.2) is used to identify which variables might cause a multicollinearity problem.

Table 4.2. The correlation matrix of the independent variables

Correlation	Legal	Public	Private	Internat.	Corrupt.	Common	Enforce	Log(GDP p/c)
Legal	1							
Public	0.31	1						
Private	-0.11	0.53	1					
International	-0.36	0.21	0.20	1				
Corruption	0.15	-0.26	-0.15	-0.40	1			
Common	0.26	0.21	-0.37	0.02	0.22	1		
Enforcement	-0.03	-0.25	0.10	-0.05	0.14	-0.60	1	
Log(GDP p/c)	0.17	-0.02	0.12	-0.36	0.60	0.13	0.04	1

We can see that, of the anti-money laundering variables, only $Public_c$ and $Private_c$ are correlated to some degree. To see the robustness of the regression results with respect to this possible multicollinearity, Columns 4 and 5 are included in Table 4.3, where both variables are excluded one at a time from the regression. Table 4.3 shows that this does not alter the result significantly.

Table 4.3. Regression output of Pooled-OLS, Random Effects, Mundlak and Robustness check

Dependent variable: *Crime*

Estimation:	OLS	RE	Mundlak	Mundlak	Mundlak
Constant	13485	24336*	12397	10418	12233
	(10739)	(14445)	(25813)	(25197)	(24640)
Legal	-339***	-335	-340	-350*	-343*
	(87)	(290)	(210)	(200)	(167)
Public	-7	-12	-6	23	
	(90)	(298)	(187)	(126)	
Private	11	16	10		9
	(21)	(69)	(44)		(30)
International	-513***	-529*	-511**	-505**	-512**
	(89)	(291)	(188)	(188)	(189)
Corruption	2751***	3038*	2723***	2764***	2735***
	(597)	(1789)	(802)	(790)	(698)
Common law	2140**	2223	2130	1910	2106
	(835)	(2768)	(1555)	(1749)	(1457)
Enforcement	972	966	972	933	973
	(668)	(2223)	(1145)	(1214)	(1133)
Log(GDP p/c)$_{ct}$	964	-132	451	448	450
	(1002)	(464)	(980)	(977)	(972)
Log(GDP p/c)$_c$			623	764	628
			(2340)	(2445)	(2299)
R-squared (adj.)	0.60	0.63	0.63	0.63	0.63

The upper number in each cell is the applicable coefficient, the number below, in parentheses, is the corresponding standard deviation, * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level. The first column is the pooled OLS regression model, the second column is the random effects model, the third column is the Mundlak specification and the last two columns are a robustness check with respect to the possible multicollinearity between Public$_c$ and Private$_c$.

As explained above in the section on control variables, the effect of these control variables on crime and on anti-money laundering policy is not unambiguous. Therefore it is interesting to see whether the estimation results are robust with respect to the chosen control variables. Table 4.4 is included to show the effect of omitting one or more control variables.

Table 4.4. Robustness with respect to the chosen control variables

Dependent variable: *Crime*

Estimation:	Mundlak	Mundlak	Mundlak	Mundlak	Mundlak	Mundlak	Mundlak
Constant	-713	5132	11751	-21490	-5074	4941	-20917
	(29868)	(26291)	(25477)	(28941)	(30463)	(25515)	(27588)
Legal	-337	-319	-316	-294	-285	-321	-287
	(216)	(218)	(190)	(245)	(219)	(190)	(242)
Public	-121	89	-7	20	-148	93	5
	(199)	(190)	(183)	(223)	(228)	(164)	(234)
Private	24	-21	6	-32	19	-21	-29
	(46)	(57)	(49)	(63)	(60)	(55)	(65)
International	-606**	-447**	-484**	-520**	-569***	-447**	-518**
	(216)	(190)	(170)	(228)	(189)	(190)	(222)
Corruption		3343***	3002***			3336***	
		(1011)	(903)			(1013)	
Common law	3626*		1390		2343		
	(1822)		(1807)		(1953)		
Enforcement	1916	-62		254			
	(1612)	(1417)		(1488)			
Log(GDP p/c)$_{ct}$	484	396	441	388	469	395	391
	(960)	(967)	(976)	(947)	(959)	(963)	(943)
Log(GDP p/c)$_c$	2923	972	620	4693*	3434	984	4671**
	(2397)	(2469)	(2300)	(2235)	(2433)	(2419)	(2137)
R-squared (adj.)	0.55	0.61	0.63	0.47	0.52	0.61	0.47

*The upper number in each cell is the applicable coefficient, the number below, in parentheses, is the corresponding standard deviation, * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.*

We can conclude, without consideration, that the significant and robust[51] result found in these estimation models is that more intense international cooperation to fight money laundering indeed is, as outlined in the theoretical model, associated[52] with a lower crime

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[51] The results are robust with respect to the inclusion of the different control variables and the chosen recommendations in the anti-money laundering variables, except for recommendation 12.

[52] The results of the estimations are described in terms of association because the estimated effect here is not per se a causal relationship. The simultaneity problem that arises here is one of the major difficulties in testing the economic model of crime (Levitt and Miles, 2007, p.457, 463) and is seen often in the strand of these empirical estimations. "However, the proper identification of causal relationships is a central endeavor of empirical testing of any economic model" (Levitt and Miles, 2007, p.463). The problem can be solved by adding observations over time, which might become possible in the future when there is more data available on the development of anti-money laundering policies in these countries. Observations over time will create the possibility of estimating Granger (1969) causality, as done first by Marvell and Moody

level. The fact that international cooperation has a statistically and economically significant effect might not be that surprising: money laundering is a crime which is to a large extent transnational and therefore needs cooperation at an international level to combat it. The hypothesis that anti-money laundering policy can be used to reduce the crime level can be accepted, with the specification that it is especially more intense international cooperation in the fight against money laundering that is associated with lower crime rates. So the efforts of the international organizations (like UN, FATF, IMF and the World Bank) have to be seen positively and might be an important instrument to decrease not only the amount of money laundering worldwide, but also the crime level.

Although the variable representing a country's legal framework to fight money laundering has a significant coefficient in some specifications, we must conclude – regarding its lack of robustness – that it has an insignificant effect. The marginal deterrence effect explained earlier could be the reason that three of the four anti-money laundering variables have an insignificant effect. It might be that domestic policies have the result that (part of) the black money is re-invested in the illegal sector (since laundering is too difficult), thereby increasing crime and decreasing the net deterrence effect to zero. In this case, international deterrence has moreover a re-allocation effect, while domestic policies have no net effect.

In all of the estimated equations, more corruption is associated with higher crime levels. This result might not be that surprising, since corruption in itself is a crime. Moreover, corrupt police officials can decrease punishments for criminals, thereby giving potential criminals a lower deterrence to commit crime. The other three control variables – rule of law, enforcement and development – are not, at least in these estimations, related with the

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(1996) for the economics of crime. Another option to solve the simultaneity problem is to include an instrumental variable (see, e.g., Levitt, 1997; Levitt and Miles, 2007, ch.3). A specific example of a good instrument for this particular empirical test on the economics of crime might be the assessment date of a country. The assessment date will, theoretically, not influence the crime rate in the country, but might – considering that anti-money laundering policies tend to become better over time – have a significant effect on the quality score of the anti-money laundering policy. Unfortunately, tests showed that the date of assessment was not a valid instrument for estimation with the current dataset.

overall crime level in a country. Although the coefficient of the effect of common law on crime is overall insignificant, its positive sign is in line with the findings of Spamann (2009).

4.8. Conclusion

The effect of the fight against money laundering can be modelled using the economics of crime as a starting point. The economics of crime and money laundering, developed in this chapter, show that the crime rate in a country can be reduced by: increasing the probability of being caught for money laundering and the predicate crime, increasing the punishment for money laundering, and by increasing the transaction costs of money laundering. Under the assumption that these factors are all positively influenced by a stricter anti-money laundering policy, the hypothesis empirically tested in this chapter is that anti-money laundering policy deters potential criminals from illegal behaviour and therefore lowers the crime rate. Since the data on anti-money laundering policy used in the literature thus far is not all-embracing, a unique indicator is constructed. This indicator is constructed by using information from the mutual evaluation reports of the FATF. This provides a unique dataset on anti-money laundering policy which can be used to estimate the often-mentioned and suspected effects of money laundering (policies) and provide these with solid empirical back-up, which is needed and lacking at the moment. This data is used in an empirical estimation based on a Mundlak specification to test the economics of crime and money laundering. The empirical estimation shows that improved anti-money laundering policies, especially international cooperation, are associated with lower crime levels. This is most likely due to the international character of money laundering. This result should be an extra incentive for countries and international organizations to continue (or start) with their efforts to promote and develop international cooperation in the fight against money laundering. See also Chapter 7 of this dissertation for an in-depth analysis of the past, the current and possible future state of international cooperation in the fight against money laundering.

Chapter 5. Trade-Based Money Laundering[*]

5.1. Introduction

Money laundering can take many forms: transferring criminal proceeds from one bank account to another repeatedly over the globe until its origin is untraceable, pretending to have won money through gambling, adding dirty money to the cash drawer of your cash-intensive business or using fake export and import bills to ship criminal proceeds outside or into a country.

The 9/11 terrorist attack in 2001 has enforced the US's sensitivity to illegal money flows, as authorities presume that such money transfers support international terrorist and criminal activities. Today financial transactions between the US and the rest of the world are closely monitored: banks have to report suspicious transactions and have to fulfil customer due diligence rules. However, Unger and den Hertog (2012) claim that similar to water which always finds its way, criminals also find new ways to escape anti money laundering regulation. Zdanowicz (2004b) sees trade as one important 'backdoor' for launderers, who can use fake invoicing of exports and imports and other forms of trade-based money laundering (TBML) to disguise illicit money flows. According to Zdanowicz, these new forms of abusing trade for laundering have not yet been addressed properly by the regulatory authorities.

TBML is a relatively unknown form of crime that is used to let illicit money pass borders unnoticed. The Financial Action Task Force (2006) "concludes that trade-based money laundering represents an important channel of criminal activity and, given the growth of world trade, an increasingly important money laundering and terrorist financing vulnerability. Moreover, as the standards applied to other money laundering techniques become increasingly effective, the use of trade-based money laundering can be expected to become increasingly attractive." As it is a quite recently discovered form

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[*] This chapter is based on Ferwerda, J., M. Kattenberg, H. Chang, B. Unger, L. Groot and J. Bikker (forthcoming) Gravity Models of Trade-Based Money Laundering, *Applied Economics*, accepted on May 29, 2012

of crime, not much research on TBML is yet available. Zdanowicz (2004a) estimates trade-related dirty money flows to and from the US, which amounts to about one fifth of its trade. He has created the only available dataset revealing an indication of the volume of this type of criminal activity.[53] To illustrate the dataset of Zdanowicz, Table 5.1 shows the top 10 countries in terms of incoming and outgoing TBML, in absolute and relative size.

Table 5.1. Top 10 countries with trade-based money laundering from and to the US, in absolute and relative terms (2004)

	TBML out of US		TBML into US		TBML out of US		TBML into US	
	in billions of US dollars				*as percentage of trade*			
1	Canada	18.3	Japan	25.6	Azerbaijan	269	Barbados	26
2	Japan	14.1	Germany	25.5	Serbia & Montenegro	72	San Marino	25
3	China	13.8	Canada	21.6	Iran	70	Italy	24
4	Mexico	13.0	China	20.3	Cuba	62	Germany	23
5	Germany	11.8	UK	16.2	Kazakhstan	35	Monaco	23
6	UK	10.1	Mexico	14.7	Bulgaria	34	Switzerland	23
7	South Korea	7.2	France	9.6	Estonia	32	UK	20
8	France	5.5	Italy	9.4	Denmark	31	Austria	19
9	Taiwan	4.8	South Korea	7.7	Barbados	26	France	18
10	Singapore	4.3	Taiwan	6.4	Philippines	24	Portugal	17

Source: dataset of Zdanowicz.

The two lists in the left-hand panel show that the major trading partners of the US also have the most TBML with the US, but the two lists on the right hand reveal that in the rankings in relative terms other countries show up. The exports to Azerbaijan are so much undervalued, that the illegal money flow outnumbers the total trade data reported by a factor 2.7. Barbados is the only country that shows up in the top 10 of both outgoing and incoming TBML countries (measured as percentage of trade).

Since the introduction of anti-money laundering policy, high demand exists for estimates of money laundering to justify the burden that is put on public and private entities in charge of chasing dirty money. Walker (1995), Schneider (2008), Unger (2007), and Bagella *et al.* (2009) estimate the amount of money laundering based on an economic

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[53] Lately, his method also has been applied by the Joint Research Center of the European Commission in Italy, to study TBML in Austria, Belgium and the Netherlands, but the results have not been published. Detailed data for individual Dutch transactions, similar to those of Zdanowicz, are not passed on for scientific research, because the Dutch customs claim that they would violate privacy protected under the Dutch Law.

or econometric model. Walker (1995) was the first to propose a prototype model to estimate money laundering worldwide. His so-called Walker model is based on the well-known gravity model, which is quite popular in trade economics (Walker and Unger, 2009; Brakman and Van Bergeijk, 2010). This gravity-style model describes the geographical allocation of proceeds of crime, which need to be laundered to cover their criminal origin. The share of proceeds transferred from country A to country B depends on the 'attractiveness' of country B and the distance between the two countries. Unger (2007) revived the model for the Netherlands, by updating it and refining the distance indicator. However, due to lack of observations of money laundering, the weights or parameters of the attractiveness factors in Walker's model were never based on statistical estimates, but only plugged in with values of an inspirational guess. Although the outcome of the prototype model seems reliable when compared with other estimations (Walker and Unger, 2009), the actual specification of the model was never tested. So, the question that is still open is whether a gravity type equation can properly explain bilateral money laundering flows.

The outline of this chapter is as follows. Section 5.2 introduces the traditional gravity model and explains how different specifications on this model are used to estimate world-wide money laundering flows. Section 5.3 describes Zdanowicz's dataset on TBML, investigates the relationship between these TBML flows and licit trade and introduces the variables used in the literature to predict money laundering. Section 5.4 tests the relevance of the prototype models of Walker and Unger for TBML. Section 5.5 presents a traditional gravity model to explain TBML. The final section draws conclusions.

5.2. The Traditional Gravity Model

For over decades the gravity model has been successfully applied to flows of the most widely varying types, such as migration, buyers distributed across shopping centres, recreational traffic, commuting, patient flows to hospitals and interregional as well as international trade. The model is inspired by Newton's universal law of gravity, which states that the attraction between two objects depends on the mass of these objects and (the inverse of) their squared mutual distance, apart from a constant. The model specifies

that a flow from origin *i* to destination *j* is determined by supply conditions at the origin, by demand conditions at the destination and by stimulating or restraining forces relating to the specific flow between *i* and *j*. In a context of international trade the traditional gravity model usually has the following form:

$$X_{i,j} = \beta_0 \, Y_i^{\beta_1} \, N_i^{\beta_2} \, Y_j^{\beta_3} \, N_j^{\beta_4} \, D_{i,j}^{\beta_5} \, P_{i,j}^{\beta_6}$$

(5.1)

where $X_{i,j}$ is the value of trade between countries *i* and *j*, Y_k is the Gross Domestic Product (*GDP*) of country *k*, N_k is the size of the population of country *k*, and $D_{i,j}$ and $P_{i,j}$ denote the distance between countries *i* and *j* and a possible special preference relationship, respectively. The gravity model of bilateral trade has become the workhorse of applied international economics (Eichengreen and Irwin, 1998) and has been used in any number of contexts.[54] Some authors assume that the size of the population has no impact, thus $\beta_2 = \beta_4 = 0$, which renders the resemblance to Newton's Law of Gravity even more obvious.[55]

The empirical results obtained with the model have generally been judged as very good. Deardorff (1998) argues that the model is sensible, intuitive and hard to avoid as a reduced theoretical model to explain bilateral trade. Yet the gravity model has some theoretical imperfections. One is the absence of a cogent derivation of the model, based on economic theory. Several authors have tried to provide the model with such a theoretical basis, using models of imperfect competition and product differentiation, notably Anderson (1979), Bergstrand (1985), Helpman and Krugman (1985), Bikker (1987, 2010), and Anderson and Van Wincoop (2003), whereas Deardorff (1998) proves that the model is also consistent with the Heckscher-Ohlin trade theory under perfect competition. None of these derivations generate the gravity model exactly as formulated in Equation (5.1).[56] This equation could only be approximated under a number of

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[54] Linders (2006) finds 200 studies (actually a sample from a much larger set), and provides a selection in his Table 5.1. For an overview, see Anderson and Van Wincoop (2004).

[55] *E.g.* Tinbergen (1962), Pöyhönen (1963a, 1963b), Pulliainen (1963), and Bergstrand (1985).

[56] The most restrictive theoretical model of Anderson, Bergstrand, as well as Helpman and Krugman, is a gravity model with only GDPs as determinants. A less restrictive model has a different functional form (Anderson, Equation (16) or additional determinants (Bergstrand, Equation (14)).

restrictive and unrealistic assumptions, as has been made clear by Bergstrand (1985). This is due to the absence of substitution in the basic gravity model of Equation (5.1). Substitution can be made plausible by an example from economic integration: the accession of Estonia to the European Union (EU) in 2004 has led to additional imports by other EU countries of wood, wood products and paper (the major export products of Estonia) – that is, gross trade creation. However, EU imports of wood products from other countries declined. This decline – trade diversion – is not described by the basic gravity model. Bergstrand (1985), Bikker (1987, 2010), Anderson and Van Wincoop (2003) and Redding and Scott (2003) extend the basic model with a substitution structure.

As TBML is closely related to trade flows, this chapter will use the successful basic gravity model – Equation (5.1), extended with additional explanatory variables – for TBML flows stemming from the US.

5.3. A Gravity Model for Money Laundering

In earlier years, Walker (1995) already recognizes that the gravity model may be useful in order to explain laundered money flows between countries. His prototype model for money laundering assumes that the share of proceeds from crime generated in country i and sent to country j depends on both the mass and 'attractiveness' of country j, and the distance between the two countries:

$$F_{ij} \Big/ \sum_i F_{i,j} = \big((GNP_j / Population_j) * Attractiveness_j\big) \Big/ (\text{Distance})_{i,j}^2 \qquad (5.2)$$

F_{ij} is the amount of money laundering flowing from country i to country j. In this model, the flows are expressed into shares of countries j in the total outflows of country i (by dividing the flows by $\Sigma_i F_{ij}$, the total amount of money to be laundered in country i). If we compare this equation to Equation (5.1), we see that Mass of j is represented by $GNP_j/Population_j \times Attractiveness_j$ and Mass of i by $\Sigma_i F_{ij}$.[57] By the way, the interpretation of Equation (3.2) as gravity model is not from Walker himself but from Unger (2007). The

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[57] Note that Mass of i is not exactly equal to $\Sigma_i F_{ij}$.

first mass factor is per capita income, based on Gross National Product (*GNP*). The second is attractiveness, which is put forward as the sum of a number of weighted factors contributing to the quality of country *j* for money laundering:

$$Attractiveness_j = 3BS_j + GA_j + Swift_j - 3CF_j - CR_j + 15$$

where *BS* is banking secrecy and *GA* government attitude, *Swift* indicates countries with financial institutions that are member of Swift, *CF* refers to conflict and *CR* stands for corruption.[58] This equation became well known in the money laundering field as the Walker equation and has been used to estimate money laundering flows (see *e.g.* Walker, 1995, and Walker, 1999). The underlying idea is that since the gravity model can predict trade flows and many other flows so well, it may also be able to predict money laundering flows. Fundamental critiques on Walker's model concern its *ad hoc* nature and the fact that it is not empirically testable, in fact because data on money laundering flows F_{ij} are lacking.

Unger (2007) modifies the Walker equation by using the distance between the countries in the attractiveness factor, instead of its square. Empirical findings are that most gravity equations for trade come up with an estimate for the coefficient of distance of around -0.9 (Helliwell, 2000). Unger (2007) also redefines physical distance by including three 'cultural' factors: sharing a common language, having colonial ties or being major trading partners of each other. Moreover, in the attractiveness index she includes the 'membership of the Egmont group', a cooperation of national Financial Intelligence Units

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[58] Note that corruption has a negative impact on laundering. Walker assumes that criminals do not like (excessively) corrupt countries, because corruption increases costs of laundering due to necessary side payments and bribes. On the other hand, a very low corruption level might make it difficult to find facilitators for laundering, increasing the transaction costs of laundering. The corruption–laundering literature is ambiguous about the sign. Chaikin and Sharman (2009) give an overview over the various theoretical links between corruption and money laundering. Dreher and Schneider (2010) find this ambiguity for the shadow economy also empirically: corruption reduces the shadow economy in high-income countries, but increases it in low-income countries.

fighting money laundering, and 'financial sector size' (measured as deposits), as proxies for the fact that extended financial markets make it easier to launder criminal proceeds.[59]

5.4. The Data

In order to apply the gravity model to TBML flows, we use data for 199 countries, stemming from four different sources. The first dataset is from CEPII (www.cepii.fr), a French research centre in international economics, which provides a database with determinants for gravity equations of trade flows. These variables are *Border dummy* (with value one when two countries share a border), *Common language dummy* (one when two countries have the same language), *Colony dummy* (one when one of the two countries was a colony of the other) and *Distance* (measured in kilometres 'as the crow flies' between the countries' economically most important cities). The second database on factors determining money laundering has been collected by John Walker for the estimation of his model (Walker, 1999). The attractiveness variables are *Corruption* (a simplified scale based on the Transparency international index of 1996, meaning that countries with a low score have a low corruption level), *Swift member* (a dummy variable with 1 for countries with financial institutions that are member), *Government attitude* (a score for the attitude of a government towards money laundering, going up with tolerance), *Conflict* (a score for a country's conflict status, with 1 for peace and 4 for a heavy conflict) and *Bank secrecy* (the score goes up with secrecy).[60] Tables A5.1-2 in Appendix 5.1 provide greater detail.

The third database is constituted by the variables defined in Unger (2007). New attractiveness variables are *Egmont Group,* a dummy with value 1 for members, and *Financial sector size*, which measures the relative size of the financial sector as Financial Deposits (demand, time and saving deposits) as a share of GDP. Moreover, she replaces the physical distance for a measure of cultural and physical distance.[61] The other variables

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[59] Further, she replaces GNP by GDP.

[60] The first two variables are from public sources, while the last three variables are from an unpublished report on potential international security threats to Australia, provided by the Australian Office of Strategic Crime Assessments.

[61] For a description of how this cultural and physical distance is constructed, see Unger (2007), page 78.

are roughly identical to those of Walker. Roughly, because the data have been constructed and for some variables scaled slightly differently, see Table A5.2 for details.[62] The forth dataset consists of the 2004 estimates on TBML flows from the US by Zdanowicz. His dataset also provides the trade data (imports and exports) for the US in millions of dollars.[63]

5.5. Identifying Trade-Based Money Laundering

Zdanowicz (2009b) has scrutinized the US Merchandise trade database for suspicious transactions. It contains all import and export transactions data of the US with the rest of the world starting in 2004. He uses ten-digit product codes,[64] hence very detailed product specifications, and assumes that international trade transactions involving abnormally high or low prices, indicate money laundering[65] (for the thresholds, see Zdanowicz, 2009b). Examples are bottles of ketchup for 50 dollars, a football for 3000 dollars, and a Gucci watch worth US$ 100,000 dollar noted as a US$ 50 Swatch on the import bill. Table 5.2 presents aggregated estimates of TBML by origin.

In 2004, an amount of US$ 175 billion entered the US by means of undervalued imports, see Table 5.2. In that case, profits are generated in the US (that is, white money has been created) by selling expensive but fraudulently low-priced imported goods in the US. US$ 48 billion flew into the US by means of overvalued exports. In that case, profits are generated in the US by selling cheap but fakely high-priced US goods to foreign clients. US$ 56 billion left the US by means of overvalued imports and 112 billion dollar by

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[62] We use Walker's definitions for the test of his model and for our traditional gravity and Unger's definitions for the test of her model.

[63] Tables A5.1-2 in Appendix 5.1 provides descriptive statistics of these variables.

[64] Transactions are classified under approximately 8,000 different products. Every item that is exported is assigned a unique 10-digit identification code. The Harmonization Code System (HS-Code) is a system of progressively more specific identifiers for a commodity. For example, concentrated frozen apple juice is assigned a 10-digit identifier. This number is an aggregate of a series of codes starting with a broad category assigned a 2-digit identifier described as Preparations of Vegetables, Fruit, Nuts, etc. It is then assigned a 4-digit identifier described as fruit juices and vegetable juices, etc. The 6-digit identifier is described as apple juice. Information from http://exim.indiamart.com/product-classification/ on May 9, 2011

[65] These abnormal prices can also indicate typographical errors or transfer pricing by multinational firms. The typographical errors will not affect our results as long as they are randomly distributed, since we correct for the size of trade in our final estimation model. Illegal transfer pricing may be included in the TBML estimates of Zdanowicz.

undervalued exports. In these cases profits are similarly generated outside the US, respectively by importing overvalued goods and exporting undervalued goods. In total TBML amounts to 391 billion US$, or 17 percent of total US trade with other countries in 2004.

Table 5.2. Trade-based money laundering estimates from Zdanowicz by origin in 2004 (billion US$)

	Imports into the US	Exports from the US	Combination
Undervalued	175 TBML into US	112 TBML out of US	Swap type 1
Overvalued	56 TBML out of US	48 TBML into US	Swap type 2

Source: own calculation based on Zdanowicz (2004a).

TBML flows may also be symmetric. Two partners in crime who both want to launder their criminal money, may set up a TBML *swap*, see the first row of Table 5.2. They sent undervalued trading goods to each other, both incurring effort and cost but also obtaining laundered money. An additional advantage may be that they both have profits as well as (tax-deductible) losses, so that they can avoid tax levies on their 'white' profits. An alternative swap consists of exchanging overvalued goods (swap type 2 in Table 5.2). This swap is even less bothersome as no need exists to sell (undervalued) goods and the overvalued goods may be disposed. Since these swaps do not transfer money internationally, they are less suited for sending terrorist money. Swaps may also be executed within one country. For international remittance of funds a single TBML transaction will do, or a (cross) diagonal combination of transactions in Table 5.2.

5.6. Relationship Between Licit Trade Flows and Trade-Based Money Laundering

Our TBML dataset allows us to investigate the relationship between licit trade flows and TBML. We refer to licit trade when we consider trade as reported in the usual trade statistics. Of course, these flows are polluted by TBML where that occurs. The basic question here is whether TBML is more or less proportional to trade flows, or whether it is distinct from licit trade. We use the Lorenz curve, normally used to measure income inequality, to visualize the relationship between trade and TBML. The calculations behind the Lorenz curves are explained in Appendix 5.2.

Figure 5.1. Lorentz curves of trade-based money laundering versus US imports and exports (2004)

1. Lorenz curve of TBML out of US through undervalued exports versus exports

2. Lorenz curve of TBML out of US through overvalued imports versus imports

3. Lorenz curve of TBML into US through undervalued imports versus imports

4. Lorenz curve of TBML into US through overvalued exports versus exports
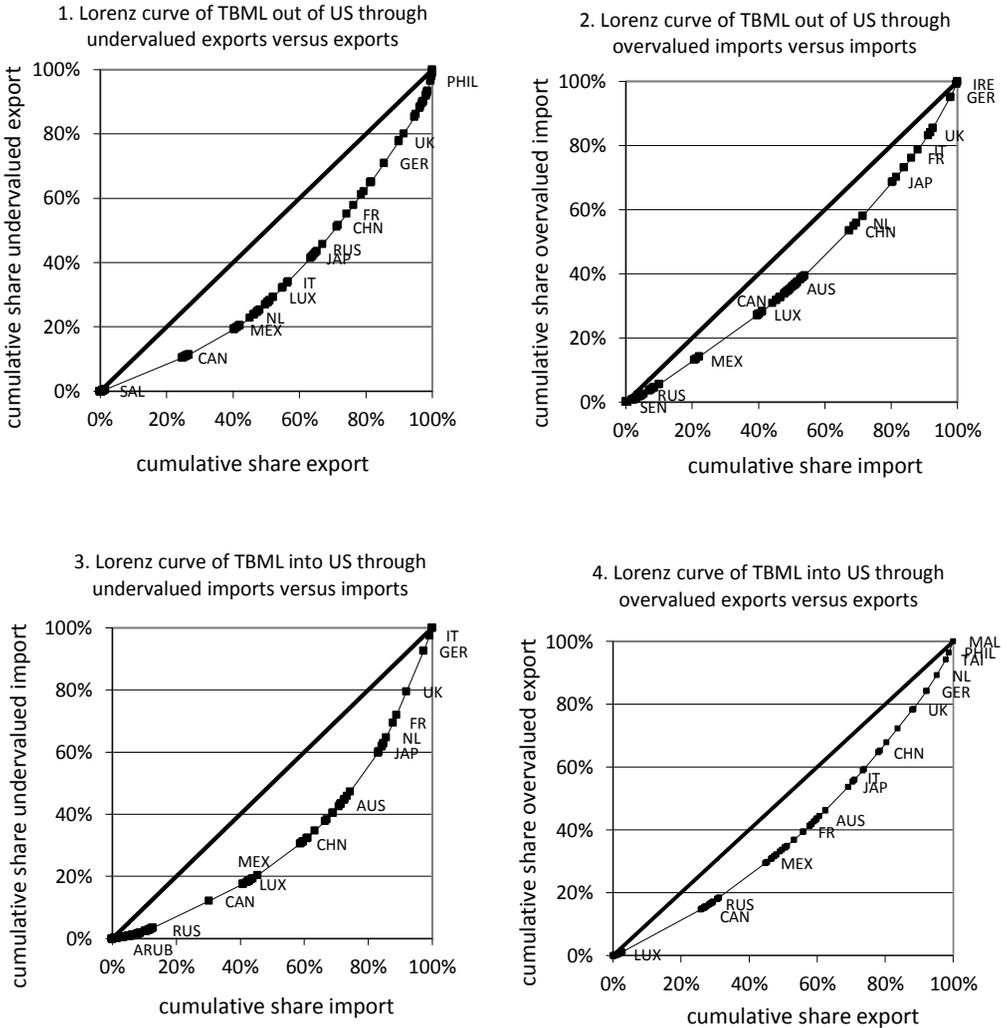
Source: Own calculation based on Zdanowicz (2004a).

The diagonal in the Lorenz curve diagram reflects TBML which is strictly proportional to licit trade, which is the case if the respective ratios are unity. The values for the ratios determine the positions in the Lorenz curve diagrams: countries with a value below 1 will be located on the bottom-left hand. If the ratio is 1, the country will be at the point of the Lorenz curve where it runs parallel with the diagonal (so with a slope of 1). Finally, countries with ratios higher than 1 will be located on the upper-right hand corner. Figure

5.1 (upper left panel) ranks countries according to the ratio of their share of undervalued exports divided by their share of total exports. The horizontal axis measures the cumulative share of exports, while the vertical axis measures the cumulative share of TBML by means of undervalued exports. Canada with a share of 23 percent in US exports and a 9.9 percent share of total US TBML outflow through undervalued exports has a ratio of 0.43, hence relatively little TBML. Japan and Italy take intermediate positions. At the upper-far right end we find the Philippines, with a ratio of 3.52, and Denmark (not shown) with a ratio of 4.95 (see also Table A5.5 in Appendix 5.1).

The Lorenz curves show that UK, Germany, France, Italy and also Malaysia always have overproportional shares, while Canada and Mexico always have underproportional shares of trade-based money laundering. Other countries have sometimes over proportional and sometimes underproportional shares. The overall picture that emerges is that TBML flows seem strongly related to trade flows. This is shown by the rather 'flat bellies' of all the Lorenz curves. What we see is that the actual Lorenz curves, especially for overvalued imports (Figure 5.1, upper right panel) and overvalued exports (Figure 5.1, lower right panel), are very close to the diagonal. To conclude, this result suggests that overall trade and TBML are strongly related. Given the absence of clear theoretical principles explaining TBML flows and the fact that in the past licit trade flows have been successfully explained by gravity models, the next sections will investigate the explanatory power of the gravity model for TBML. If we go into greater detail, we observe that countries with a dubious reputation such as Barbados, Liberia, Monaco, Philippines and Switzerland have overproportional TBML by a factor of at least three, indicating that TBML is not just a 'normal' part of licit trade (see Table A5.5, the FATF black list and the OECD grey list).

5.7. Testing the Walker Model for Trade-Based Money Laundering

We apply the prototype model proposed by Walker (1995) on TBML to test whether his specification is supported by our data. Therefore, we replace in Equation (5.2) the share of country j for money laundering from country i ($F_{ij} / \sum_i F_{i,j}$) by the share of country j for TBML from the US ($TBML_{ij} / \sum_j^n TBML_{ij}$):[66]

$$TBML_{ij} \bigg/ \sum_j^n TBML_{ij} = (GDP_j / Population_j) * \frac{(\beta_1 BS_j + \beta_2 GA_j + \beta_3 Swift_j + \beta_4 CF_j + \beta_5 CR_j + \beta_6)}{D_{ij}^{\beta_7}}$$

(5.3)

Table 5.3 presents the estimation results of Equation (5.3). Since the model is nonlinear in its parameters, we use the Nonlinear Least Squares (NLS) estimation procedure. Starting values for the model parameters, as required in the NLS's iterative numerical estimation procedure, stem from Walker (1995). Column 1 gives the initial Walker values as in Equation (5.2), while Column 2 gives the estimated NLS coefficients, which differ greatly from the Walker values for money laundering, where, for some variables, even the sign changed. The only coefficient that is significantly different from zero is the coefficient of distance (D). With an estimated value of 0.614 (significant at the 1% level), this coefficient is however not close to the value of 2, as suggested by Walker (and as in Newton's gravity law). The model is able to explain 43% of the variation in the share of total TBML across countries.[67]

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[66] Note that our application of this Walker model differs from the standard gravity model for trade in the sense that we have data of flows to or from the US only, while normally flows from many origin countries to many destination countries are considered. Since in the Walker model only the characteristics of the destination country j matter, we use only the flows of TBML from the US to all other countries in the world. We cannot use the TBML flows to the US, because these flows all have the same destination country j (the US) and therefore have no variation in the model of Equation 5.3.

[67] A caveat is that Walker specifies his model for money laundering while we test the model using data of only one type of money laundering.

Table 5.3. Testing the Walker (1995) model using estimates of trade-based money laundering flows out of the US (2004)

	Walker's values for ML	NLS estimates of Equation (3.3) for TBML			
	Parameters α_i	Coefficients β_i	Standard deviation	t-test H_0: β_i=0	t-test H_0: $\beta_i = \alpha_i$
Column	(1)	(2)	(3)	(4)	(5)
Bank secrecy	3	-0.022	0.015	-1.51	-201.47
Government attitude	1	-0.037	0.024	-1.52	-43.21
Swift membership	1	0.072	0.077	0.95	-12.05
Conflict level	-3	0.110	0.090	1.23	34.56
Corruption level	-1	-0.015	0.013	-1.20	75.77
Distance to US (D_{ij})	2	***0.614	0.079	7.78	-17.54
Constant	15	0.052	0.074	0.71	-202
Nr. of observations		199			
Adjusted R^2		42.7			

Note: *** indicates significance at the 1% level.

To test whether the estimates differ significantly from the suggested values in Walker (1995), we assume that the errors are distributed normally and use the coefficient standard errors in Column 3 to compute *t*-values of the estimates in Column 5. Column 5 tests for each model variable the null hypothesis that the true beta coefficient is equal to the Walker values (denoted by α_i). For each of the model parameters, we reject the Walker value. We conclude here the Walker (1995) model is unable to explain the estimates of TBML from the US to all other countries in the world in a satisfactory manner.[68]

5.8. Testing the Unger Model for Trade-Based Money Laundering

As a next step we use our dataset to evaluate the Unger model, a modification of Walker's model for money laundering as suggested by Unger (2007), which includes cultural factors for the constructed measure of cultural and physical distance (*CPD*) and two more variables for the attractiveness: size of the financial sector and Membership of the Egmont group. The equation that will be estimated is specified as:

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[68] Please note that the failure of the Walker model to explain TBML well could come from the fact that the parameters of the Walker model have never been tested but resulted from an inspirational guess or because money laundering in general is explained significantly differently than TBML.

$$TBML_{ij} \Big/ \sum_{j}^{n} TBML_{ij} = (GDP_j \,/\, Population_j) * (\beta_1 BS_j + \beta_2 GA_j + \beta_3 Swift_j + \beta_4 CF_j + \beta_5 CR_j$$
$$+ \beta_6 Egmont_j + \beta_7 FD_j + \beta_8) \Big/ CPD_{ij}^{\beta_9}$$

(5.4)

Table 5.4 presents the estimates of Equation (3.4). The parameter values in Column 1 are suggested by Unger (2007).

Table 5.4. Testing the Unger model (2007) applied to trade-based money laundering flows out of the US (2004)

	Unger's values for ML	NLS estimates of Equation (3.4) for TBML			
	Parameters α_i	Coefficients β_i	Standard deviation	t-test H_0: $\beta_i = 0$	t-test H_0: $\beta_i = \alpha_i$
Column	(1)	(2)	(3)	(4)	(5)
Bank secrecy	3	-0.056	0.039	-1.45	-78.36
Government attitude	1	-0.082	0.054	-1.51	-20.04
Swift membership	1	0.014	0.117	0.12	-8.43
Conflict level	-3	0.021	0.019	1.10	159.00
Corruption level	-1	0.023	0.025	0.92	40.92
Egmont group	1	0.074	0.065	1.14	-14.25
Financial deposits	1	-0.002	0.009	-0.28	-111.33
Physical and cultural distance	1	***2.848	0.327	8.71	5.66
Constant	10	0.161	0.147	1.09	-66.93
Nr. of observations		199			
Adjusted R^2		42.8			

Note: *** indicates significance at the 1% level

Table 5.4 shows that – similar to the testing of the Walker specification – all coefficients are insignificant, except the coefficient of the cultural and physical distance (2.85), which is significantly at the 1% level. Column 5 presents the t-test values on the null hypothesis that the Unger parameter values are 'true'. The results make clear that all variables are significantly different from what is suggested by Unger (2007). We conclude that we hardly find any empirical underpinning for the prototype models of Walker (1995) and Unger (2007), except that one of the key variables of the gravity model – distance – is apparently essential.

5.9. A Gravity Model for Trade-Based Money Laundering

Since the Walker model and the Unger model do not seem to explain TBML well, we use a traditional gravity model – see Equation (5.1) – expanded by the variables used in

the attractiveness indicators of the Walker and Unger models to explain TBML.[69] This model has a straightforward log-linear nature instead of the combination of additive and multiplicative variables as in the prototype models of Walker and Unger.

Table 5.5. Trade-based money laundering gravity model for US outflow (2004)

| | Gravity model for TBML | | | | Best fit model (AIC) | |
| | Model with trade | | Model without trade | | Structural model | |
	Coefficient	St. dev.	Coefficient	St. dev.	Coefficient	St. dev.
Trade	***1.02	0.09			***1.03	0.09
GDP	*0.22	0.18	***0.85	0.28	**0.14	0.07
Population	-0.05	0.10	0.06	0.24		
Border dummy	***-2.60	0.64	-0.13	1.61	***-2.53	0.57
Common language	0.33	0.35	0.42	0.53		
Colonial background	-0.20	0.61	0.66	1.14		
Swift membership	-0.15	1.20	0.00	1.69		
Egmont membership	0.48	0.33	**1.42	0.59	**0.59	0.28
Financial deposits	-0.05	0.32	*1.05	0.63		
Corruption level	0.20	0.28	-0.14	0.57		
Bank secrecy	0.11	0.19	0.40	0.39		
Government attitude	*-0.44	0.25	-0.64	0.50	**-0.39	0.19
Conflict	*0.31	0.19	0.24	0.31	0.29	0.19
Distance	*-0.34	0.19	***-1.10	0.31	***-0.34	0.14
Constant	**-5.26	2.24	5.42	4.53	**-3.88	1.54
Nr. of observations	199		199		199	
R^2, adjusted	88.2		66.9		88.5	

*Notes: *, **, *** indicates significance at, respectively, the 10%, 5% and 1% level. We estimated with OLS and calculate robust standard errors.[70] All variables are expressed in logs.[71]*

Table 5.5 presents the results of the gravity model for TBML flows. One of the driving factors of TBML is licit trade itself: the larger the trade flow, the larger opportunities for fraud. Therefore, in the TBML model at the left-hand side of Table 5.5 trade has been added as explanatory variable. We call this the 'model with trade', as it explains the

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[69] Our dataset consists of estimations of TBML from the US to the rest of the world only, while normal gravity models use data of flows between all origins and destinations. To show that it is possible to estimate a gravity equation with data on only a part of the flows, we estimated a standard gravity equation for trade with our dataset in Appendix 5.3.

[70] To test for multicollinearity we perform a VIF-test on all three models presented in Table 5.5. The results for the model with trade, the model without trade and the best-fit model are respectively 2.82, 2.68 and 1.85. Since all VIF-values are far below the proposed cut-off points of 5 and 10, we conclude that we do not have a multicollinearity problem.

[71] Note that we use only one variable for categorical variables (as explained in Table A5.2 in Appendix 5.1), instead of a dummy for each category. Using a dummy for each category does not alter the results significantly.

impact of trade separately from the other explanatory variables. The next paragraph will discuss the 'model without trade'. We consider the model with trade the best specification of a TBML gravity equation, because it allows us to distinguish between the impact of trade on TBML and the effect of other determinants. Estimation results confirm that trade is an important determinant of TBML, as its coefficient is significant at the 1% level. The coefficient of around 1 indicates proportionality between trade en TBML, in line with the Lorentz curve analysis in Section 5.6. Except for trade and the border dummy (which in this case is basically a dummy for US trade with Canada and Mexico), many independent variables are insignificant or only significant at the 10% level. Therefore, we use Akaike's Information Criterion (AIC) to search for the best fit model specification. The model with the lowest AIC is presented at the right hand side of Table 5.5. The AIC indicates to drop *Population*, *Common Language*, *Colonial Background*, *Swift membership*, *Financial deposits, Corruption level* and *Bank secrecy*. In this leaner specification, *GDP*, *Egmont Membership*, *Government Attitude* and *Distance* become significant at a 5% level. TBML flows can best be explained by GDP (which represents the mass of the countries), trade (which represents the mass of the flow in which TBML is hidden), distance (as is standard in gravity models, corrected for border countries) and two anti-money laundering policy variables (*Egmont-membership* and *Government attitude*). Surprisingly, the two anti-money laundering policy variables have the opposite sign of what was expected by Walker (1995) and Unger (2007). Membership of Egmont, *i.e.* a cooperation agreement between countries to fight money laundering together, leads to more TBML and countries with a government that have a hostile attitude towards money laundering have more TBML than those with a more tolerant attitude. These relations can probably best be explained by the fact that TBML has been discovered quite recently, while the anti-money laundering policies at the moment are targeted almost completely on the traditional form of money laundering in the financial system. Our results suggest that money launderers use TBML as an alternative for traditional money laundering when the country they send their money to is fighting (the traditional form of) money laundering intensively. An alternative explanation is that countries which face more money laundering are more eager to undertake adequate actions to combat it.

Finally, the middle panel of Table 5.5 presents the estimation results of the 'model without trade'. Here, the underlying classical gravity model for international trade – with GDP, Population and Distance as its main determinants – is as if substituted in the 'model with trade'. As a result, TBML is explained directly from the traditional gravity variables GDP, Population and Distance as well as the typical money laundering variables. As common in trade models the GDP coefficient does not differ significantly from 1 and the distance measure coefficient does not deviate significantly from -1. Remarkably, in this specification, the Egmont membership coefficient is significantly at the 5% level, while the Financial deposits coefficient is significantly at the 10% level. However, the goodness-of-fit measure (adjusted R^2) makes clear that this model without trade is inferior to the model with trade (69.2% versus 88.2%). Apparently, the (complete) trade data are of great importance in explaining TBML.[72]

5.10. Conclusion

An evaluation of the effects of anti-money laundering policies is hampered by an enormous lack of data. That has motivated Walker and Unger to propose a prototype model for money laundering which has characteristics of the traditional gravity model. The model parameters were based on guess estimates. We use a dataset of Zdanowicz on trade-based-money laundering and find that TBML is indeed much more frequent in relative terms in US trade with countries which have a dubious status in terms of money laundering. With this dataset, we are able to test the Walker and Unger prototype models for money laundering when applied to TBML. Our conclusion is that these models perform badly for this subset of money laundering. We replace the functional form of the Walker model, which is a mix of linear and multiplicative variables, by a multiplicative traditional gravity equation as frequently used for trade flows, and extend this model with explanatory variables from the Walker and Unger models. We are then able to explain the distribution of TBML between 199 countries and the US in a satisfactory manner. TBML appears to be highly related to licit trade, which permits this kind of money laundering to go unnoticed, as illicit proceeds hide in the large pool of licit exports

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[72] In the reduced form model only the model value of trade (exclusively of the residual or error term) while in the structural model the complete value (including the error term) is used.

and imports. Other explanatory variables are distance between the respective two countries, correction for bordered countries, GDP of the importing country, and whether the importing country fights money laundering. The latter is measured by membership of Egmont, *i.e.* a multilateral cooperation agreement to fight money laundering together, and by the attitude of the importing country towards money laundering. Hence, we can apply the traditional intuition of a gravity model – that is, explain a flow by two masses and the mutual distance – to TBML. One might expect that governments which agree to fight money laundering (through their Egmont Membership) and have a hostile attitude towards money laundering experience less TBML. However, our results suggest the opposite: countries, which have strict anti-money laundering regulation, experience more trade related money laundering. This may indicate that criminals have discovered a new way of laundering by using TBML to escape stricter anti-money laundering regulation of the financial sector.

Chapter 6. Detecting Money Laundering in the Real Estate Sector*

6.1. Introduction

Estimations of the level of money laundering reach up to 2 to 5% of world GDP[73], raising the question where all this money goes. A potential answer lies within the real estate sector, large enough to absorb a large part of this money, and prone to money laundering because of features such as the heterogeneity of buildings, the non-transparency in the market and possibilities for hiding the true owner. So far, however, no systematic study has been conducted on the importance and frequency of money laundering in the real estate sector. This chapter tries to use the information known to authorities to systematically identify and analyse money laundering in this sector. Though the data refer to the Netherlands only, the method can be used for other countries as well.

This chapter is organised as follows: After describing why the real estate sector is prone to money laundering, we explain the research method and present a list of 17 indicators that we use to find the real estate objects that are most likely related to money laundering. Subsequently, we describe how the criminologists analyse 200 of these objects on a case-by-case basis. The results of this criminological research are used in the last part of this chapter to find out, through use of econometrics, which indicators can detect conspicuous real estate, and which fail to do so. In the conclusion, we present a draft magic formula which can help to find money laundering objects in the real estate sector.

[73] This was a first estimate of money laundering by the managing director of the IMF, Micheal Camdessus, in 1998. Figures within that range were later found by Walker (1995 and 1999) and Unger (2006 and 2007).

6.2. The Potential Abuse of the Real Estate Sector

The real estate sector has certain characteristics that make it prone to money laundering. It has a very high value, which makes it attractive for both legal and illegal investments (Eichholtz, 2006). Therefore, this sector has quite a potential to absorb a substantial volume of money laundering activities. The real estate sector displays the following characteristics that make it susceptible to money laundering (see Nelen, 2008):

Real estate

- is a safe investment[74]
- is a prestigious investment
- has an objective value that is difficult to assess
- is a sector in which speculation is tradition
- allows to distinguish between legal and economic ownership (the buyer and seller in the papers are not necessarily the person who provides or gets the money)
- allows to realize 'white' returns (e.g. apartment rents)
- can be used to conduct criminal activities (e.g. a chemical drug lab)

The OECD (2006) identifies that the real estate sector is used to facilitate tax fraud and money laundering in most of the countries they survey. There is a general concern that the construction industry is used to generate unreported income and to invest unreported income coming from other industries, including illegal activities (OECD, 2006).

The study of Meloen et al. (2003, p. 246) also shows that real estate is a popular sector for criminals to invest in. Meloen et al. analysed 52 Dutch criminal cases in which property with unlawful advantages was confiscated. They found that in thirty to forty percent of money laundering cases, money was invested in immovable property. The study points to the importance of the real estate sector for laundering. However, given the limited number of cases studied, it cannot draw conclusions regarding the overall size of the problem.

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[74] Even though todays newspapers are filled with articles about uncertainty in the real estate market, real estate still seems to be a relatively safe investment for money launderers.

The Dutch Scientific Research Documentation Centre WODC (Kleemans et al. 2002, p.132) also finds, from analysing eighty cases, that investment in real estate is an efficient method to place large amounts of money. The price increase of real estate is profitable and the profits in the real estate sector create a legal basis for income.

Real estate objects can be used for criminal purposes in a number of ways. In the literature, a distinction is made between criminal exploitation and criminal speculation. Money laundering belongs to the latter category and is defined as a series of activities meant to disguise the origin of illicit funds. It can refer to the first phase of laundering, where one tries to place the illegal money into a real estate construction (e.g. giving cash to a real estate agent in order to buy a house), to the second phase of laundering, where one tries to pump the money around the world (e.g. a foreign bank giving a loan to a person buying a house, with the loan in reality being the hidden money of the person buying the house) and to the third phase of laundering, in which case the criminal parks the money in the real estate sector and is not interested in trading real estate, but in investing.

However, real estate can also be used for criminal investment without the intention of laundering money. For example, an ecstasy producer who buys a house in order to use it for ecstasy pill production might not do this with the intention to hide the illicit origin of his money, but just to do criminal business. In this study, we did not (and could not) distinguish between money laundering and criminal investment without the intention to hide the illicit origin of money.

6.3. Research Method

Although "it is often extremely difficult to identify real estate transactions associated with money laundering" (FATF, 2007, p.5), the aim of this research is to develop a data research method that enables its user to filter out suspicious real estate transactions and distinguish them from all the ordinary ones. We are looking for the transactions of real estate objects with a motive other than the normal transactions: the outliers. According to the definition, an outlier in general is an observation that deviates so much from other observations as to arouse suspicion that it was generated by a different mechanism

(Hawkins, 1980). To find the criminal investments amidst all the usual real estate transactions, we develop a list of characteristics that are associated with criminal investments in the real estate sector, the 'red flags'[75]. This is in line with the remark by Nelen et al. (2007, p.75) that illogical and unusual behaviour in the real estate sector indicates an increased risk of criminal behaviour. Although a single characteristic in itself is not enough to arouse suspicion of a criminal investment, we believe that a combination of these characteristics might be. To give an example: although it is often mentioned in the literature that many criminal investments in the real estate sector are financed with money from abroad, we cannot, of course, conclude that all real estate transactions financed from abroad are suspicious. However, we can label them unusual[76] and conclude that the more unusual characteristics a transaction has, the more it should arouse suspicion (this is in line with the vision of Belastingdienst/FIOD-ECD, 2008, p.28).

For a visual representation of this research method, we refer to Figure 6.1. The outer circle represents all the investigated real estate objects, the grey circles are the subgroups found with the indicators. The black surface is the congruent of real estate objects that have the characteristics of all three indicators. The small open circle represents the criminal investments in this sector (the subgroup we are looking for). We assume that by using more and more indicators this circle will be filled more and more with darker surfaces.

When using such an indicator-based approach, one is always confronted with the trade-off between false positives and false negatives, or the so-called type I and type II errors, respectively. A false positive in this specific research occurs when an object is marked as (potentially) criminal while it actually is not. A false negative occurs when a criminal investment is not detected by our research method. The trade-off between these two errors is visualized in Figure 6.2.

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[75] With respect to the use of red flags, we follow the phrasing and research method of FATF (2007) and FEC (2008).

[76] By using the word 'unusual', we follow the phrasing of the Dutch FIUs that make a distinction between unusual transactions and suspicious transactions.

Figure 6.1. Visual explanation of the method used for this research
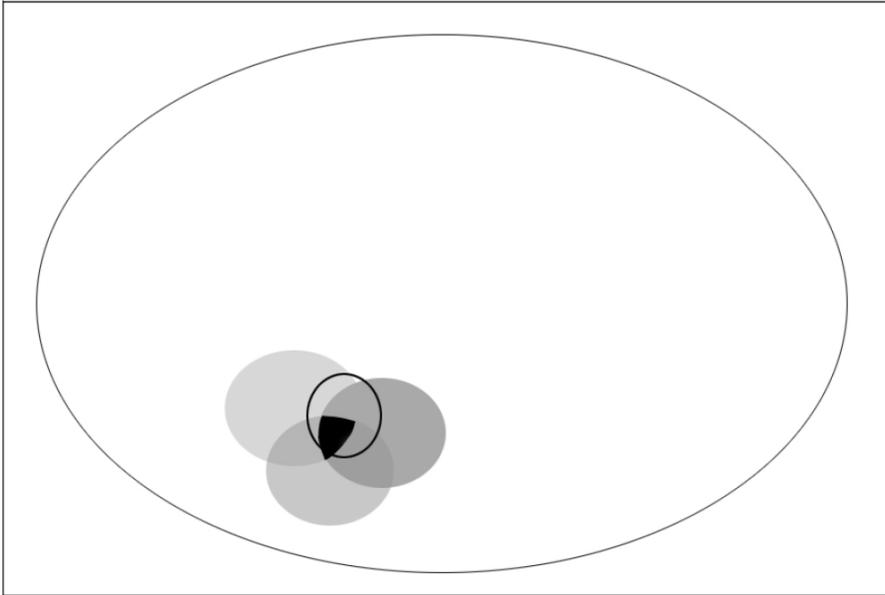
The outer circle shows all the real estate objects. The grey circles are three indicators. The black open circle represents the criminal investments in this sector.

Figure 6.2. Trade-off between false positives and false negatives
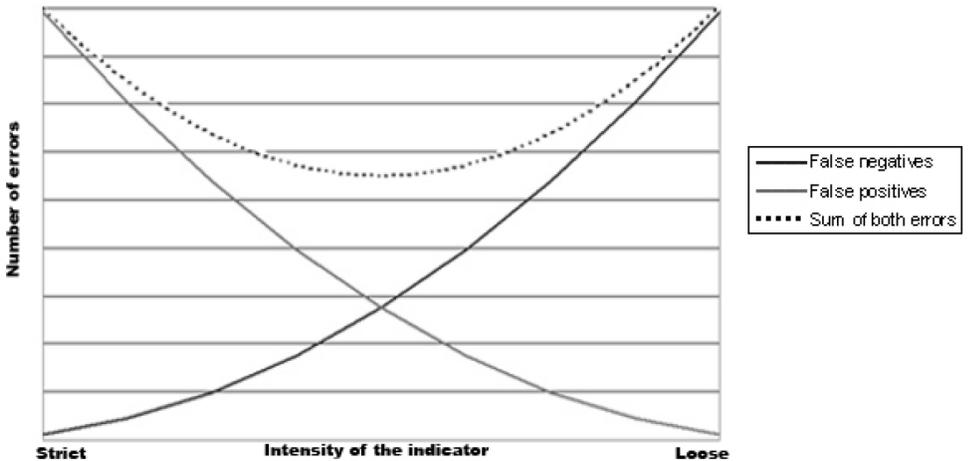
Figure 6.2 is best explained by discussing the two extremes: a very strict indicator and a very broad indicator. A very broad indicator (right end of the graph) marks almost all objects as unusual. Therefore, there will be very few false negatives (the red, downward

[83]

sloping line), at the expense of a lot of false positives (the blue, upward sloping line). A very strict indicator (left end of the graph) marks hardly any object as unusual. Therefore there will be almost no false positives, at the expense of a large amount of false negatives. The optimum can be found at the minimum of the sum of these two errors (the parabola), if one attaches equal importance to both errors. Since we do not know the amount and types of errors we make, we circumvent this dilemma by choosing a different research method. We will not mark any object unusual based on just one indicator, but will do so based strictly on the combination of several indicators. Since we assume that real criminal activities have an increased chance of receiving more red flags than normal activities, we can conclude that the number of false positives will diminish quickly once we start looking at the combination of several indicators. Therefore, we focus more on the false negatives of a single indicator than on the false positives. This means that we will use relatively broad indicators (and therefore accept an increased degree of false positives).

6.4. The Indicators

Based on an extensive literature research, we developed a list of 17 indicators that we can operationalize[77] for our dataset. We mainly use Dutch publications (like the reports of the Dutch Financial Expertise Centre (FEC) and the Dutch Financial Intelligence and investigation Unit (FIOD)), because our analysis is on the Dutch real estate sector, but we include also some international publications (like the reports of the Financial Action Task Force (FATF) and the OECD)

Indicator 1: Financier is from abroad

The misuse of a foreign legal party as a financier is the prototype of disguising the fact that you invest your ill-gotten gains into the real estate sector (van de Bunt et al., 2007, p.67). The idea is that it becomes harder to discover the origin of the money when a

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[77] Although the literature mentions more indicators, here we only present the indicators that we can actually apply to our dataset. See Unger and Ferwerda (2011) for a more complete list of indicators and a more extensive explanation on these indicators. The indicators might not all be directly related to money laundering, but could also indicate other forms of criminal investments or exploitation.

(preferably anonymous) foreign company is used to finance the investment. The Dutch Tax Administration and the Dutch financial intelligence and investigation unit in their report also warn about the use of foreign companies for the financing of real estate (Belastingdienst/FIOD-ECD 2008, p.12, p.20, p.23, p.32 and p.33). The literature mentions many cases in which foreign companies played an important role in money laundering constructions. For instance[78], case 1.1 in FATF (2007), where money was invested in the Dutch real estate sector with loans from several foreign companies that were actually controlled by the person receiving the loan. The idea behind this is that one can invest their own (dirty) money by first transferring it to a foreign country and then lending it back to oneself. This disguises the origin of the money, which is exactly the aim of money laundering. The use of foreign companies for this loan-back method is also described, among others, in Nelen et al. (2007, p.54-55), Trouw & Knobbout (2007, p.10) and Belastingdienst/FIOD-ECD (2008, p.13).

Indicator 2: Financier is a person, not a company

When banks provide a mortgage to finance the purchase of real estate, there are certain control mechanisms in place, like comparing the necessary income with the applicant's wage. When people provide a mortgage, this control is unclear, which can be an indication that this way of financing is used for dubious purposes. The Belastingdienst/FIOD-ECD (2008, p.33) states that a mortgage not provided by a financial institution can point in the direction of money laundering. See also van de Bunt et al. (2007, chapter 6) and FEC (2008), who mention that a mortgage by a non-business-party, especially a foreign one, must raise suspicion.

Indicator 3: Financing is unusual compared to appraised value

An indication for a fictitious mortgage is when the mortgage is significantly higher than the appraised value of the object, since a bank will normally not provide a mortgage above the actual value of the property (Belastingdienst/FIOD-ECD, 2008, p.24). The FATF (2007, p.36) also mentions in its report that buyers taking on a debt that is significant in

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[78] See also for example case 4.1 in FATF (2007) and case 18 in FATF (2006)

relation to the value of the property should arouse suspicion. A significantly high mortgage is found especially in cases where a 'straw man construction' is used.

Indicator 4: Financing is not used (no mortgage)

Real estate is the most expensive property most people will ever buy and not many buyers are wealthy enough to pay the whole purchase amount without the use of a mortgage. The absence of a mortgage should raise the suspicion of the notary (FEC, 2008, p.19) and can indicate the misuse of foreign legal persons (van de Bunt et al., 2007, p.114). A study on real estate in Amsterdam (PEO, 1995) specifically focussed on objects that were bought without the use of a mortgage, because it considered this a helpful indication of money laundering (Trouw & Knobbout, 2007, interview 3). This indicator is also apparent in case study 3.5 described by FATF (2007), in which two high-value properties (of more than 20 million Euro) were bought in France with a single payment (not a loan). Later it became clear that it concerned an investment of dirty capital, disguised by offshore companies.

Indicator 5: Financing is provided by the owner (same person)

The use of transactions with oneself is mentioned as a characteristic of money laundering in the real estate sector (Belastingdienst/FIOD-ECD, 2008, p.10). According to the Belastingdienst/FIOD-ECD (2008, p.28) and the FATF (2007, p.35), the use of illogical and unnecessary complex financial constructions should arouse suspicion. We consider providing a mortgage to oneself dubious. This indicator is often mentioned in connection to the loan-back construction, which is described in many publications on money laundering methods, see for example OECD (2006), Ferwerda et al. (2007), Nelen et al. (2007, p.55), Belastingdienst/FIOD-ECD (2008, p.12-13) and FATF (2007, p.7-8).

Indicator 6: Owner is from abroad

Purchasing real estate abroad adds a layer of disguise, because one is not known by the local authorities. In the back-to-back loan construction especially, the purchase of real estate is done from abroad. Although it is often mentioned that this is done by offshore

companies only (like in FATF, 2007, p.12-13 and p.35, and van de Bunt et al., 2007), others mention that it is done by foreigners in general (Nelen et al., 2007, p.54).

Indicator 7 and 8: Owner is person with unusual number of objects or transactions

The FEC (2008, p.20) and FATF (2007, p.34; 2006, p.8) mention that a red flag should be raised when a person performs several transactions. The Belastingdienst/FIOD-ECD (2008, p.29) mentions that a sudden increase in someone's real estate portfolio can indicate the urge to launder a large amount of money within a short period of time (see also FEC, 2008, p.23).

Indicator 9: Owner is company with a particular exploitation

The FEC (2008, p.16) and Trouw & Knobbout (2007) suggest that money launderers invest in and with companies that they have knowledge of. Also Belastingdienst/FIOD-ECD (2008, p.5 and p.37) cautions against business sectors with an increased risk for criminal investment. The FATF (2007, p.27) mentions that within the real estate sector some areas are more attractive for criminal investment than others. Which sectors are specifically suspicious, and have an increased risk or are more important for money laundering? While the FEC (2008) does not mention any sectors, Belastingdienst/FIOD-ECD (2008, p.5 and p.37) mentions illegal exploitation (such as illegal pensions, cannabis nursery, human trafficking, illegal gambling, and illegal prostitution) and risky legal sectors (such as hotels, restaurants, 'coffeeshops' [79], prostitution, gambling, and transport). Trouw & Knobbout (2007) mention catering services, prostitution and transportation. The FATF (2007, p.27) mentions the hotel business, construction firms, development of public or tourist infrastructure (especially luxury resorts) and the catering business.

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[79] In the Netherlands the selling of marihuana is tolerated in so-called coffeeshops.

Indicator 10: Owner is a company just established

The FEC (2008) suggests that a company that has just been established and is immediately buying up real estate is likely to be part of a construction of companies designed to conceal the ultimate beneficial owner and to launder money. Also, Belastingdienst/FIOD-ECD (2008, p.28) and the FATF (2007, p.35) warn about transactions by certain companies that have just been founded.

Indicator 11: Owner is a company without employees

According to the FEC (2008), real estate companies that do not have employees are very likely to be part of some sort of money laundering construction (see also van de Bunt et al., 2007, chapter 4). the FATF (2007, p.14) describes the use of empty companies in money laundering constructions and calls these companies 'shell companies'; the company only consists of a shell, without any contents.

Indicator 12: Owner is a 'world citizen' (unknown to the Tax Administration)

When a foreigner purchases real estate in the Netherlands, this leads to a tax payment duty abroad. A problem occurs with this payment obligation when it is unknown where the purchaser pays his taxes, i.e. when the purchaser is unknown to the national Tax Administration. Investors who have no tax payment duty, or at least not in the Netherlands, should raise a red flag (FEC, 2008, p.16). Also Belastingdienst/FIOD-ECD (2008, p.4 and p.28) mentions these kinds of foreign real estate owners as an indicator for money laundering.

Indicator 13: Real estate object is involved in multiple transactions

When an object is bought and sold multiple times, this can indicate a swindle to push the price above the property's actual worth. FEC (2008), Ferwerda et al. (2007, chapter 4) and Belastingdienst/FIOD-ECD (2008, p.17) all mention this occurs and that it can be a major part of a money laundering process, especially with the use of the ABC construction and carousel fraud (driving up the price by successive sales and purchases within the

same organization with the eventual goal of making the object appear worth more (or less) than it actually is). The FATF (2007) explains that the method of successive sales and purchases, which is in line with the above-mentioned methods, has the specific characteristic that the property is (fictitiously) sold in a series of subsequent transactions, each time at a higher (or lower) price.

Indicator 14 and 15: Real estate object in a very bad or very good neighbourhood

The FATF (2007, p.37) sees transactions in high-risk urban areas as an indicator for money laundering in the real estate sector. Also van Gestel et al. (2008, p.35-36) mention the link between criminal activities in this sector and the liveability in the corresponding district. Nelen & Huisman (2008) find the relationship between bad neighbourhoods and organized crime not undisputed, and mention that there is hardly any evidence that deprived areas and marginalized business activities are breeding grounds for organized crime. Areas and sectors that, as a result of governmental policies, have been uplifted seem just as vulnerable. It could be that criminals want to show off their purchases and show the rest of the world that they are (or were) successful in business. This consideration might result in investments in very good, fashionable and expensive neighbourhoods. Therefore both extremes (very bad and very good neighbourhoods) are used as separate indicators in this study.

Indicator 16 and 17: Purchase amount is unusual compared to appraised value or previous purchase amount

A purchase amount that is too high or too low can indicate a swindle to drive up the price, like an ABC construction or the fraud carousel, or play a role in tax fraud. This is one of the most visible indicators of criminal investments in real estate, since the purchase prices are transparent, at least in the Netherlands. This might be the reason that, as so often mentioned in the literature, a too high or too low purchase price is suspicious (see for example Nelen et al. (2007, p.47, 56), FATF (2007, p.24 and 21) and Ferwerda et al. (2007, chapter 4)). The comparison of the appraised value with the purchase amount using Dutch data was suggested by Eichholtz (2006, p.67) and done by Siegman (2006).

[89]

Although Siegman (2006) was able to depict strange price increases of real estate in Amsterdam, he did not continue his efforts to estimate the amount of money laundering in the real estate sector, because there was no way he could differentiate between the price increases caused by money laundering and those caused by speculation of real estate agents. This study tackles this issue, at least partly, by using many more indicators, by cooperating with criminologists and by the use of closed data in addition to publicly available information.

6.5. The Application of the Indicators to our Dataset

To be able to apply all the above mentioned indicators, we comprise a database for 11,895 real estate objects, which comprises of all real estate objects in Utrecht and Maastricht (two cities in the Netherlands with respectively about 310,000 and 120,000 inhabitants) that were sold at least once within the period 2002-2006.[80] This database consists of data from the Dutch Offices of Land Registry (information from the deed of conveyance, object number, purchase amount, name and date of birth of purchaser and seller, gender for natural persons, business form for legal persons, mortgage amount, the provider of the mortgage, etc.) and from the Dutch Tax Administration (such as income of the subject, establishment date of legal persons, appraisal value, some tax information, etc.). Once we apply all the 17 indicators to our dataset,[81] we can see (as depicted in Figure 6.3) that many real estate object have a couple of red flags,[82] but that finding more than 5 red flags for one object is quite exceptional. The 150 real estate objects with the most red flags receive a criminological case-by-case analysis. To increase the impartiality

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[80] We did not select any part of the real estate sector, which means that all kinds of real estate are included, ranging from houses and offices to churches and undeveloped land.

[81] The application of these indicators is sometimes quite cumbersome and has led to some limitations for the research. For example, the nationality of the owners is not available in the dataset and therefore we use the former addresses of the owners as a rough indication of the nationality. Another example is that some indicators need threshold levels to indicate what is unusual and what is not, while this is not specified in the literature. We describe the limitations and (sometimes arbitrary) decisions for the application of the indicators in Unger and Ferwerda (2011), Chapters 4.2 and 5.3.

[82] This is a logical consequence of the use of relatively broad indicators, as explained earlier.

of the criminological research we add 50 real estate objects with less than 5 red flags to the list as a control group, without signalling this to the criminologists. [83]

Figure 6.3: Distribution of red flags for Utrecht and Maastricht
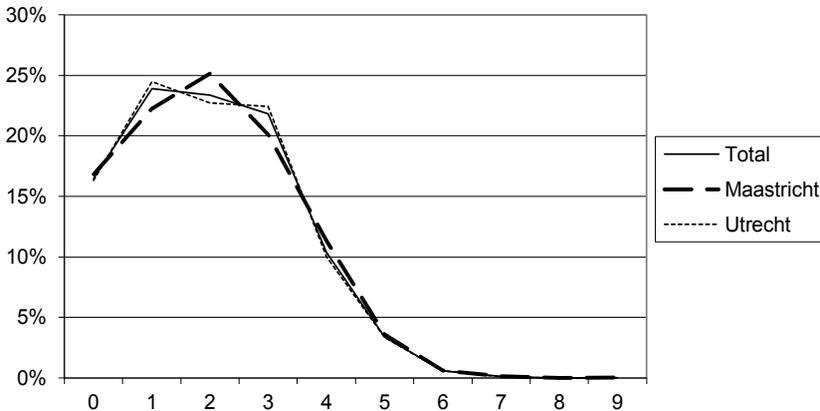
Source: made by the authors. The percentage refers to the percentage of objects with an X (0 through 9) number of red flags relative to the number of objects in the group (Utrecht, Maastricht or the two cities combined).

6.6. Criminological Analysis

The criminological research is done independent from the application of red flags and by criminologists that do not know how many red flags each object received. For the impartiality of this study we have to stress that the criminologists try to focus as much as possible on different indicators than mentioned above. This is mainly possible because the case-by-case basis of the criminological research provides the possibility to use many more sources of information and apply a whole different range of indicators. For example, the 200 cases are supplemented with open-source information (like the name of the notary, the use of the notary account during the transaction, anything that might show up on Google) and closed source information (like whether the persons involved have antecedents, whether the persons involved performed any unusual or suspicious

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[83] The selection of only 200 objects for criminological research is due to the limited criminological research capacities in the project.

transactions[84] and the tax declarations of the persons involved). The case-by-case analysis also gives the opportunity to perform more extensive analyses, like a network analysis to detect natural and legal persons that work together in an organised fashion or an individual analysis to detect whether the persons involved can play the role that they play (e.g. do they have enough capital/income to get that mortgage, or is there some kind of straw men construction?).

The method of analysis is based on describing two possible scenario's – a licit and an illicit one – and the evaluation which of the two is best supported by the facts that showed up during the analysis. Eventually, the criminological analysis indicates that 36 of the 200 objects should be labelled as 'conspicuous'. We do not use the term 'suspicious', because we are only able to analyse what we see on paper and cannot go as far as actual police investigation. Of the 36 conspicuous objects, 5 are linked with drugs, 27 with fraud and 4 with renting irregularities. While 9 of the 36 cases are strongly conspicuous, 8 are moderately conspicuous and 19 have only a weak indication that something is wrong.

In addition to this criminological research, the criminologists also asked stakeholders at the ground level (such as local police officers), which subjects and objects have raised their awareness in the two cities. Overall, this survey results in a list of 356 subjects and 32 objects deduced from various sources. Comparing this list with the list of 1130 subjects identified in the 200 cases gives only two hits, which concern the same strongly conspicuous case. The meagre results of this so-called bottom-up analysis can indicate that the application of red flags is not very effective to find the relevant objects and subjects, but can also indicate that our method points to subjects and objects that are not yet known by the local authorities.

We now use the results of the criminological analysis (36 conspicuous cases) to estimate which indicators can identify the relevant real estate objects and which indicators fail to do so.

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[84] In the Netherlands obliged entities (like banks, notaries, car dealers, etc.) report all unusual transactions to the FIU-Netherlands. The FIU-Netherlands then starts to analyze these reports and decides which of them can be classified as suspicious.

6.7. Statistical and Econometrical Analysis

If red flags are a good indication for conspicuous cases, we would expect that the conspicuous cases have more red flags on average than the objects that are not marked conspicuous by the criminologists. The conspicuous objects have, on average, 5.4 red flags, while the 200 selected objects have, on average, 4.8 red flags. So, red flags seem more frequent for the conspicuous objects than for the sample of 200. More disappointing at first glance seems that when we remove the 50 objects of the control group, the 150 unusual objects identified in the economic analysis have on average 5.7 red flags, i.e. more red flags than the 36 conspicuous objects identified by the criminological analysis. This disappointing finding changes, however, when we take into account the degree of conspicuousness, which shows that more red flags indeed do point at more strongly conspicuous objects: the weakly conspicuous objects have 5.1 flags on average, the moderately conspicuous objects have 5.5 red flags on average, and the strongly conspicuous objects have 6.1 red flags on average. The average, median and modus amount of red flags of all 11,895 analysed objects lie around two. This result seems to confirm the idea behind this study that a real estate object with more red flags has an increased chance of being related to money laundering or other criminal investments.

In our econometrical analysis the dependent variable (whether the object is conspicuous or not) is a binary variable. We will therefore use a specific econometric estimation model that takes this into account: the so-called Probit model. To show the robustness of the results of this specification, we present the results of two other estimation models: OLS and Logit. Since the number of conspicuous objects is quite low (less than 20%), we add the results of the complementary log-log model, which is particularly useful for cases where one of the outcomes (conspicuous in this case) is rare. Since the Probit model does not assume linearity and therefore cannot be interpreted directly, we calculate the marginal effect of each indicator and show this with the other estimation results. The results of the econometric analysis are shown in table 6.1. Practically, the primary focus is on the results (significant or not) in Column 1. Columns 2,

3 and 4 are a check on the robustness of the results and Column 5 is used to interpret the significant results.

Table 6.1. Estimation results

Dependent variable: Conspicuous (or not)	(1) Probit	(2) Logit	(3) cloglog	(4) OLS	(5) dprobit
2&5 Financier is a natural person and mortgage to self (same surname)	0.73	1.12	0.80	0.16	0.23
	(0.56)	(1.02)	(0.87)	(0.14)	(0.21)
3 Unusual mortgage compared to appraised value	0.03	0.20	0.29	0.03	0.01
	(0.37)	(0.67)	(0.60)	(0.09)	(0.09)
4 Absence of mortgage	0.32	0.60	0.56	0.08	0.08
	(0.30)	(0.54)	(0.47)	(0.07)	(0.07)
6 Foreign owner	0.53*	0.95*	0.81*	0.14*	0.15
	(0.30)	(0.52)	(0.44)	(0.08)	(0.09)
7&8 Owner has unusual number of objects and does unusual number of transactions	0.31	0.64	0.61	0.07	0.07
	(0.29)	(0.53)	(0.45)	(0.07)	(0.06)
9 Risky exploitation	0.36	0.57	0.45	0.08	0.10
	(0.30)	(0.52)	(0.45)	(0.08)	(0.09)
10 Owner is a just-established company	0.78**	1.36**	1.17**	0.21**	0.24*
	(0.36)	(0.62)	(0.52)	(0.09)	(0.13)
11 Owner is a company without employees	-0.17	-0.27	-0.19	-0.05	-0.04
	(0.26)	(0.46)	(0.40)	(0.07)	(0.07)
12 Owner is a 'global citizen'	0.22	0.42	0.43	0.05	0.06
	(0.35)	(0.62)	(0.53)	(0.09)	(0.10)
13 Object involved in multiple transactions	0.02	0.03	-0.04	0.00	0.01
	(0.33)	(0.58)	(0.53)	(0.08)	(0.08)
15 Object in good neighbourhood	0.08	-0.06	-0.29	0.01	0.02
	(0.34)	(0.64)	(0.56)	(0.08)	(0.09)
16 Unusual purchase amount compared to appraised value	-0.37	-0.67	-0.55	-0.12	-0.08
	(0.33)	(0.61)	(0.54)	(0.08)	(0.06)
17 Unusual price fluctuation	0.84***	1.44***	1.20***	0.23***	0.25**
	(0.30)	(0.52)	(0.44)	(0.08)	(0.10)
Constant	-1.67***	-2.93***	-2.89***	0.03	
	(0.37)	(0.72)	(0.65)	(0.08)	
Observations	200	200	200	200	200
Pseudo R2	0.103	0.103			0.103
Adjusted R2				0.0364	

Standard errors are given in parentheses. P-values (chance of a coincidental relationship) are shown with superscripts: *** = p<0.01, ** = p<0.05, * = p<0.1. The (adjusted or pseudo) R^2 (coefficient of determination) of cloglog cannot be calculated, but regarding the comparable values of the log likelihood it is most likely comparable to the Probit model (in Column 1) and the Logit model (in Column 2).[85]

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[85] Since indicators 2 and 5 and indicators 7 and 8 are strongly correlated, these indicators measure more or less the same. We combine the indicators to prevent potential multicollinearity and to need less independent variables and therefore have more degrees of freedom. The results when these indicators are

All the significant effects in Table 6.1 are positive, which means that these indicators can be used to 'detect' conspicuous objects. The most significant effect found in the econometric analysis is that objects with an unusual price fluctuation (indicator 17) are associated with an increased chance of 25percentage points to be conspicuous. Objects owned by a company that was just established (indicator 10) are associated with an increased chance of 24 percentage points to be conspicuous. Finally, objects with a foreign owner (indicator 6) are associated with an increased chance of 15 percentage points to be conspicuous. For the rest of the indicators there is no significant effect on the probability to be conspicuous.

6.8. Conclusion

This chapter describes a pioneer and pilot study for detecting money laundering in the real estate sector by using the skills of both economists and criminologists. The study consists of three main steps. We start with an outlier detection model based on 17 indicators derived from the literature. In the second step a criminological analysis is conducted on the 150 objects with the most indications for money laundering, mixed with 50 seemingly normal objects. Once we determine that 36 object can be labelled conspicuous, we use an econometrical analysis in the last step to find out which of the 17 indicators can detect these conspicuous objects.

Our hope for this study was to end up with a magic formula that allows the identification of suspicious objects from objective data. At this stage of research we can only provide a first draft formula for such a magic detection tool, which could be refined and improved in the future.

used separately are more or less similar, except that 7 and 8 both become significant, one positive (7) and one negative (8). These effects seem to counter each other when combined (as an interaction term). The multiplication of indicators 2 and 5 is the same as just indicator 5. Indicator 1 and 14 are dropped due to insufficient variation (not enough conspicuous cases have this characteristic, respectively 1 and 0).

The draft magic formula that can 'detect' conspicuous objects:[86]

Chance to be conspicuous = 15% * foreign owner + 24% * just-established company +
25% * unusual price fluctuation

Figure 6.4 shows the objects with 5 or more red flags and which are labelled as conspicuous on the map of both cities. There is no clear concentration in one neighbourhood, as the objects are rather evenly spread on the map.

Figure 6.4. Objects Identified in Utrecht (left) and Maastricht (right)
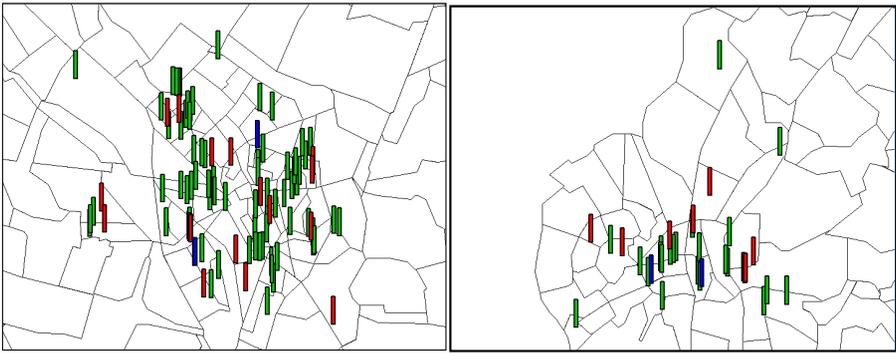
Source: the authors, graph made by Arjen Siegman. The 5 black bars are the objects from the control group of 50 objects that are nevertheless identified as conspicuous, while the 31 dark grey bars are the conspicuous objects that are not in the control group of 50. The other 119 light grey bars are the objects that have 5 or more red flags, but are not labelled conspicuous in the criminological analysis. The bars are moved slightly to protect the privacy of the analysed objects and subjects.

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[86] How could this formula be used? If we have a case where a foreigner sells a real estate object to a just-established company, which then sells the object a couple of months later for a significantly higher or lower price, there is a 64% chance that this case is conspicuous. Because it has all three characteristics the calculation is: 15% * 1 + 24% * 1 + 25% * 1 = 64%. Now let us consider a case where a just-established company buys real estate from a foreigner for a normal price: then the chance that this real estate is conspicuous is 39%. Because it has two of the above characteristics, the calculation is: 15% * 1 + 24% * 1 + 25% * 0 = 39%. Note that 'detect' is written in quotation marks, because the significant relationships are not causal per se; a characteristic could lead to criminal activity, but criminal activity could also lead to a certain characteristic. Also note that it is not clear to what extent we can generalize the results, since the sample is fairly small (200 objects) compared to the whole sector (11,895 objects), and not random and therefore normally not representative.

Chapter 7. The International Fight Against Money Laundering[*]

A Principal-Agent Problem with Strategic Behaviour

7.1. Introduction

In the international fight against money laundering and terrorist financing, the FATF evaluates countries' anti-money laundering and terrorist financing policies. These evaluations are now more and more checking law in action instead of only law in the books. One of the parameters on which the FATF bases its evaluations is the number of reports on suspicions of money laundering and terrorist financing[87] (suspicion reports) disclosed to the national Financial Intelligence Units (FIUs). The establishment of such an FIU in each country and the way it functions is also part of the anti-money laundering policy standards set by the FATF. The FIU screens the suspicion reports received from the obliged reporting entities, such as banks, exchange offices, credit card companies or dealers in large values, and filters them for further investigation by e.g. the police. The number of reports in each country is used as an evaluation means as they are assumed to reveal the responsiveness of the market to the threat of money laundering. Since countries with a negative evaluation by the FATF face the threat of blacklisting and harsh economic isolation, countries' intrinsic motivation in passing the FATF test well, or at least not too bad, is high. Therefore, producing a high number of suspicion reports might be considered wishful.

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[87] Most of these reports are on suspicions of money laundering. The focus of this chapter is therefore primarily on these reports, but a similar analysis applies to reports on suspicions of terrorist financing.

Fighting transnational crime requires a joint effort. Economic theory suggests that in the context of a public good (where agents face shared benefits and private costs) the free-rider problem might occur (Cornes and Sandler, 1986). In this context, naming and shaming and punishing on behalf of the international community is a means to ensure that all countries put effort in the fight against money laundering. In this chapter, by means of a principal-agent model with multiple agents, we show that the current absence of a harmonised legal definition of a suspicion report could lead to suboptimal strategic behaviour by countries. In order to avoid negative FATF evaluations, countries can artificially increase the number of reports by changing the legal definition of a suspicion report or its interpretation. We present six aspects of the definition that are suitable for this strategic behaviour and that will result in higher numbers of reports: 1. The type of report (some reports refer to only cash transactions, while others refer to all transactions; some reports only refer to only transactions, while others refer to any activity) 2. subjective grounds of suspicion (the level of necessary knowledge when defining a transaction as suspicious can be reduced – even a weak and vague suspicion will then lead to a report); 3. objective grounds of suspicion (the reporting threshold of the amount of money involved in a transaction, for which a report must be filed, can be lowered); 4. the definition of a transaction (specifying which activities constitute transactions can reduce the applicability of reporting in situations that fall outside the scope of this definition); 5. the inclusion of attempt (including the attempt of a transaction even when stopped will increase the number of reports) and 6. the data collection methodology (separating a report of a bundle of transactions into separate reports for each transaction will increase the number of reports). Even without countries' strategic behaviour, these six aspects carry on in national statistics and thus create a difference between countries, which makes comparison of numbers difficult and which creates a gap between the statistics on paper and the reality. The more so, when countries start using these six options strategically. But not only countries are involved in reporting. Also the reporting entities might have their own special interests in lowering reporting costs and behaving strategically (see Takáts, 2007). The reporting entities might put domestic pressure on countries' governments that aim at reducing the number of reports. The number of reports that finally are registered is hence the outcome of multiple factors, including international pressure of being blacklisted, countries' own perception of the importance

of money laundering policy, domestic pressure by the reporting entities for lower reporting costs, and strategic behaviour of both national governments and reporting entities. Section 7.2 models the behaviour of national governments within this tension.

Through a case study on reporting in nine European countries, Section 7.3 verifies to what extent the definition of suspicion reports differs across countries and whether amendments to these definitions might be related to previous FATF evaluations (international pressure) or reporting entities that want to lower their costs (domestic pressure). This chapter then sketches three policy options for the FATF. The FATF can try to harmonise the legal definition of suspicion reports, since this would take away the possibility for countries to engage in strategic behaviour. The FATF can also restructure the current units of measurement such that they are better comparable across countries, more specifically, to measure and compare proceeds of crimes and natural persons instead of the number of reports. The last and most extreme policy option is to fundamentally change the evaluations. The FATF should stop with sending bureaucrats to the countries to check what is written on paper and test the daily practice in the country with what we call *mystery shopping*. This idea is based on how the customer service of shops can be tested. One executes a money laundering operation in the country and tests whether the authorities will uncover it.

Before presenting the model in Section 7.2, the case study in Section 7.3 and the policy options in Section 7.4, we set the stage with a short overview of the relevant literature and a short history of FATF's international policy.

The most influential academic work in the field of money laundering reporting by the private sector has been carried out by Takáts (2007) on the so-called Theory of Crying Wolf. He identified a principal agent problem between the FIU and the reporting entities. The principal, the FIU, cannot distinguish between useful and useless information received from the agent (a bank or other reporting entity). When, at the extreme, a bank reports all its transactions as suspicious, the FIU cannot prove the bank's intention to mislead the authority. Takáts warned the authorities for potential strategic behaviour of the private sector. He found a relation between the sanctions for the private sector for

not reporting and the resulting amount of reporting. Reporting entities have to make a trade-off; they can either report less, thereby saving them the costs to make all the reports for the FIU but accepting the possibility to get sanctioned, or they can increase the amount of reporting to decrease the chance of getting sanctioned by their supervisor, but having to accept the extra costs related to the extra reports. Takáts showed that the amount of reporting went up as soon as the sanctions were raised but that this did not necessarily lead to more convictions of money launderers, since the quality of the reports went down at the same time. Basically, when sanctions are too high, the FIU will get over flooded with diluted information; useless reports that are simply filed by the reporting entities to make sure they can never be accused of a failure to report. Takáts showed that the relation between the height of the sanction and the effectiveness of the whole AML process until conviction can be depicted as an inverted U-shape, like in a Laffer curve: if sanctions get too low or too high their impact on effectiveness is negative.

The blacklisting[88] of the FATF has an interesting history. The first blacklist of the FATF appeared in 2000, listing in total 15 countries, mainly small islands in the Caribbean and the Pacific. The list published the following year contained even more countries (19), but from then on, the number of countries vastly declined, until Myanmar was removed as last country on the list in October 2006. Figure 7.1 gives a visual representation of this development.

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[88] Officially, the list of the FATF is not called a blacklist, but a list of Non-Cooperative Countries and Territories, based on 25 'negative' criteria such as banking secrecy, some loopholes of law and financial regulation (for the complete list see FATF 2000). The countries that meet many (there seems to be no clear threshold) of these 25 negative criteria, have a poor anti-money-laundering record and are listed as NCCTs. This list is perceived as a clear example of a blacklist, because of its clear tactic to name and shame the countries on the list.

Figure 7.1. Countries blacklisted by the FATF in 2000/2001 (upper figure) and in 2006 (lower figure)
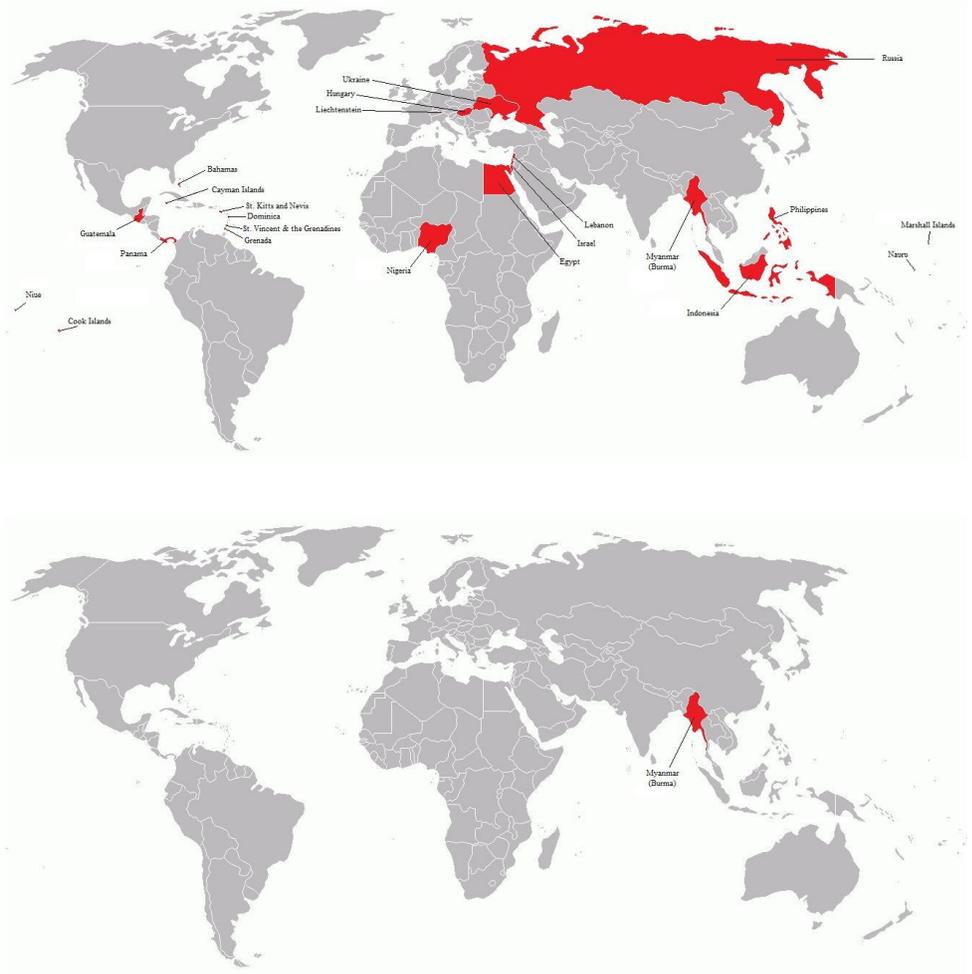
Seeing the blacklist progressively getting empty naturally raised the question whether all countries had become compliant with FATF standards – so that the world had united to fight money launderers – or whether this was only declared compliance, compliance in the books (Unger and Ferwerda, 2009, p.131). Given the fact that crime and the proceeds of crime all over the globe had definitely not disappeared but rather increased, the empty list was undoubtedly due to failures in measuring actual compliance rather than to big successes of fighting crime and money laundering. Unger and Ferwerda (2009) heavily

criticized the black and white thinking of a black list, and the unfairness of the naming and shaming procedure, and urged for developing a grey list, that would allow us to see to which extent countries fight money laundering. This is indeed what happened, when in February 2010 the FATF publishes a sort of grey list, which distinguishes four groups of non-compliant countries ranging from red (very very) non-compliant till yellow (little) non-compliant (see Figure 7.2).

Figure 7.2. Grey list of the FATF in February 2010
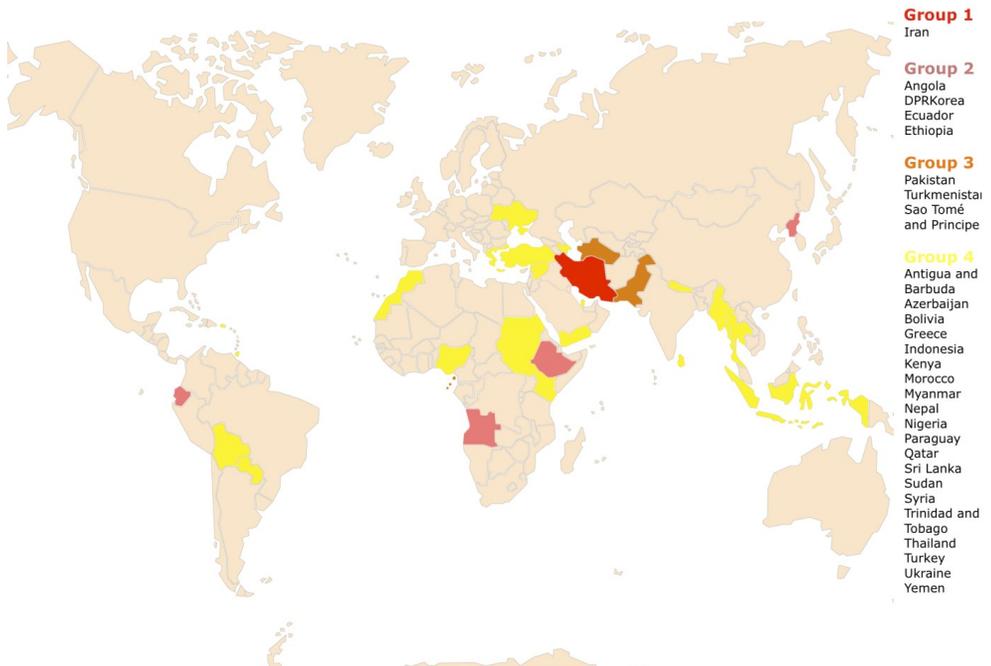
Source: http://baselgovernance.org/fileadmin/docs/liste.jpg. The scale of the FATF goes from group 1 (Iran), which is according to the FATF the most high risk country, to group 4, countries which have only some deficiencies and have already developed a plan to address them.[89]

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[89] Group 1: Jurisdictions subject to a FATF call on its members and other jurisdictions to apply countermeasures to protect the international financial system from the ongoing and substantial money laundering and terrorist financing (ML/TF) risks emanating from the jurisdiction. Group 2: Jurisdictions with strategic AML/CFT deficiencies that have not committed to an action plan developed with the FATF to address key deficiencies as of February 2010. The FATF calls on its members to consider the risks arising from the deficiencies associated with each jurisdiction. Group 3: Jurisdictions previously publicly identified by the FATF as having strategic AML/CFT deficiencies, which remain to be addressed as of February 2010. Group 4: Jurisdictions which have strategic AML/CFT deficiencies for which they have developed an action plan with the FATF. While the situations differ among each jurisdiction, each jurisdiction has provided a written high-level political commitment to address the identified deficiencies.

One could speculate on how this grey list will develop. Will it also get empty over time? Will this create the necessity to create a white list, which shows the good performers, the countries which have an intact money laundering policy in place?[90] Seen the history of the blacklisting strategy of the FATF, we expect that both questions will eventually be answered affirmatively. We can already report that the latest grey list of the FATF (June 2011) consists of only 10 countries, down from 28 (in February 2010)[91], indicating that this grey list might again rapidly be reduced to a couple of countries or even none.

With the knowledge on the history of the FATF's blacklisting policy, we will now introduce the principal-agent problem that the FATF faces. Subsequently we show with a case study on nine European countries how the current state of reporting in Europe is and how this relates to our principal-agent problem. The current principal-agent problem and the reporting systems in the different countries leaves the FATF with a few policy options, which we will discuss in the last section before we conclude.

7.2. The Model: The Principal-Agent Problem of the FATF

The FATF strives for an international fight of money laundering and wants all countries in the world participating adequately. To make sure no country shirks its responsibility to fight money laundering, the FATF monitors the effort taken by countries to fight money laundering. Since the effort is not directly observable, the FATF performs regular checks to measure effort and compiles its findings in a series of mutual evaluation reports. This relates to a standard principal-agent model. In a general principal-agent model, the principal's role is to create the incentives for agents to exert effort and to punish the deviant agents based on indirect observations of effort. Because agents know that their effort cannot be observed directly, they might engage in strategic behaviour. The

[90]We owe this point to John Braithwaite, given during the ECPR conference (Re)Regulation in the Wake of Neoliberalism, Consequences of Three Decades of Privatization and Market Liberalization, Panel: Naming and Shaming, European Consortium for Political Research (ECPR) conference, held at Utrecht University, The Netherlands, June 5th – 7th, 2008

[91] Nineteen countries were removed from the list: Angola, Antigua and Barbuda, Azerbijan, Ecuador, Greece, Indonesia, Marocco, Nepal, Nigeria, Pakistan, Paraguay, Qatar, Sao Tomé and Principe, Sudan, Thailand, Trinidad and Tobago, Turkmenistan, Ukraine and Yemen, while one country was put on the list: Cuba.

principal-agent relationship becomes problematic once there is asymmetric information and conflicting interests (Ross, 1973).

In our model, the FATF is the principal who offers a payment of non-blacklisting to the agents, defined as countries. When a country is blacklisted it faces negative payoffs, because this affects its reputation and trade and business relation. It can even lead to economic isolation and other counter measures.[92] Our agents, the countries, need to provide resources for fighting money laundering. On the other side of the game are the reporting entities, the actors of the private sector, who have to report suspicion reports at their own costs. The rational behaviour of these reporting entities is to try to put in the least effort possible without being punished.[93] Minimizing efforts in our model is defined as minimizing the number of suspicion reports sent to the FIU. To sum up, in our model countries face the international pressure of potential blacklisting and the domestic pressure of reporting entities which want to minimize their reporting costs, as depicted in Figure 7.3.

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[92] 'When the Pacific island Nauru was blacklisted for money laundering, economic sanctions were discussed and media reports indicated that it was threatened with sanctions. The US authorities issued cautions to its banks to take special precautions when dealing with Nauru. At first not much happened. However, when only three countries remained on the blacklist – Nauru, Nigeria and Myanmar – some banks and financial institutions took their own initiatives and refused to make any transactions with any of these countries. Though these were the decisions of individual corporations, and not of countries, and definitely not multilateral sanctions' they meant economic harm to Nauru (e-mail interview with Greg Rawlings, 25.4.2008). In the Netherlands, the Dutch Ministry of Finance asked the Financial Market Authority (the supervisory board for financial markets) to take initiatives to stop all financial transactions with Nauru. In the absence of an international law or any legal basis for sanctions, economic sanctions are the only threat for blacklisted countries. These economic sanctions can be relatively easily pronounced towards small countries with little trade relations (the Dutch – Nauru economic relations are of minor importance to the Dutch economy), but are very difficult to apply to the major trading partners (the Dutch – US economic relations are of importance to the Dutch economy, so stopping financial or trade relations with the US would be very costly for the Netherlands). (Unger, B. and J. Ferwerda (2009) Regulating Money Laundering and Tax Havens: The Role of Blacklisting, in: Sabitha, A., *Combating Money Laundering – Transnational Perspectives*, Chapter 5, Corporate Law series of Amicus Books, Icfai University Press)

[93] The punishment for the reporting entities can be a sanction from their supervisor for not reporting a suspicious transaction (which can be a monetary fine but can also, in some countries, include imprisonment), but can also be the reputational damage that occurs when media report of money laundering within a bank or other reporting entity. In essence, the situation for the obliged entity is somewhat similar to the trade-off that the countries face; more reporting is costly, but reduces the reputational risk and the probability of punishment.

Figure 7.3. The trade-off for governments in the light of international and domestic pressure

International pressure

The FATF

FATF demands high numbers of reports, with the threat of blacklisting

The Government of country A

Domestic pressure

Reporting entities want to lower their amount of reporting to reduce costs

Reporting entity (e.g. bank)

Reporting entity (e.g. jeweler)
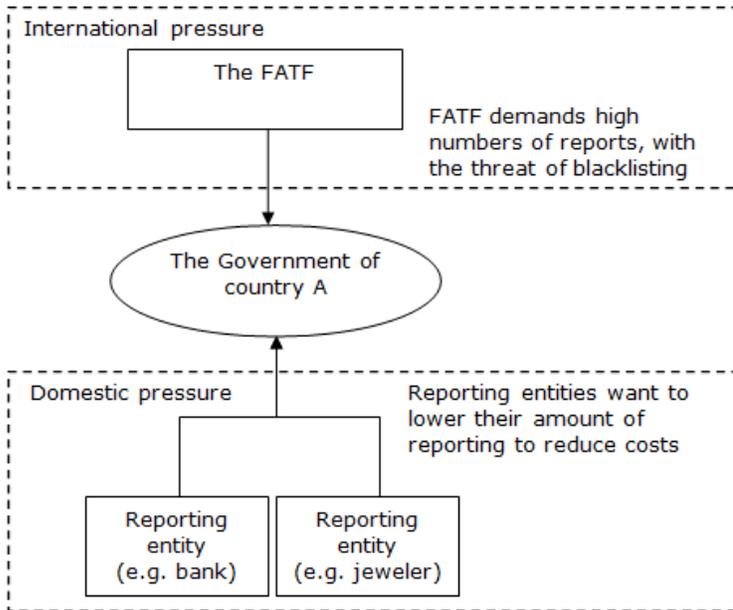
There are two things that clog the perception of the FATF, which cannot observe the true crime fighting behaviour of the countries (in this sense there is full asymmetric information). First of all, the FATF relies upon the fact that the number of recorded reports offers a good picture of the efforts put in fighting money laundering.[94] This can be disputed. To give an example: Country A can report more than Country B because there is simply more money laundering going on in the country and in this case reporting does not say anything about the fighting money laundering efforts in Country A vis-à-vis country B. Secondly, there is a form of strategic behaviour in this interaction: countries can choose

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[94] Please note that this is an extreme simplification. The FATF issues 40 recommendations to fight money laundering. When the amount of suspicion reports is low, the FATF can conclude that the reporting system does not function effectively, or that the responsiveness of the reporting entities is too low, and that the country therefore receives a lower compliance score for recommendation 13. Recommendation 13 says that "If a financial institution suspects or has reasonable grounds to suspect that funds are the proceeds of a criminal activity, or are related to terrorist financing, it should be required, directly by law or regulation, to report promptly its suspicions to the financial intelligence unit (FIU)." Recommendation 16 says that the same applies to non-financial institutions. The same logic applies more or less for the other recommendations of which the effectiveness is measured by statistics, but it is explained the easiest for the number of suspicion reports.

to loosen legislation such that they raise their payoffs at the expense of their rivals, without actually fighting crime. The latter aspect will be discussed more extensively in section 7.3.

For our model, we assume that the FATF introduces one minimum compliance standards (a blacklisting threshold of a certain amount of suspicion reports)[95] and, in order to incentivize agents, introduces monitoring with punishment.

Therefore, we define the strictly monotonous, convex pay-off function for the agents (the national governments) as

$$v(i) = -c * r(i) - p(i) * S$$

where *v(i)* is the overall payoff function, *c* are the economic costs of reporting one suspicion report to the FIU, *r(i)* is number of suspicion reports sent to the FIU of country I, *p(i)* is the probability of being blacklisted, which is 0 if *r(i) > T* and 1 if *r(i) < T*[96], S is the sanction when being blacklisted[97] and *T* is the threshold number of suspicion reports as set by the FATF.

Costs increase as more reports are filed, since every report is costly. Note that there is no incentive to report more than the blacklisting threshold, since this only leads to extra costs for the reporting entities. Consequently, as can be seen in Figure 7.4, if we assume that the sanction of blacklisting is sufficiently high (*S > c*T*), to incentivize the agents to comply, the optimal amount of suspicion reports is equal to the blacklisting threshold set by the FATF.

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[95] Please note that this is a simplification. The first blacklist was developed in 2000 based on assessing countries with regard to 25 'Criteria for Identifying Countries and Territories Non-Cooperative in Anti-money Laundering and Terrorist Financing' (see FATF 2000).

[96] We can easily add uncertainty here (which might be closer to reality) by making p(i)=f(r(i)), where df/dp<0, but this does not alter the model results significantly and only complicates the analysis.

[97] We assume here that the blacklisting sanction is the same for all countries, although we are aware that Rajkovic and Falkner (2011) showed that different countries care differently about being blacklisted.

Figure 7.4. The pay-off function of an agent (country i)
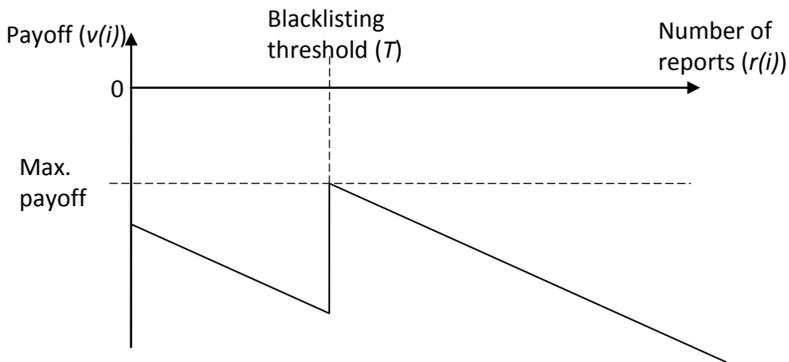
Note that all terms of the pay-off function are negative and that the optimal amount of reports is found at the minimal costs, equal to the blacklisting threshold.

If we assume all countries are alike (in terms of money laundering threats, size of the economy through which money would be laundered, number of neighbours, costs for reporting, bureaucracy and political decision making institutions, etc.) except for the number of reports ($r(i)$), then rational behaviour of the countries would lead to a convergence in the number of reports over time to just above the blacklisting threshold (T). Figure 7.5 illustrates this development for nine countries that have a different amount of reports in the initial time period (t=0).

Countries with a high number of reports have an incentive to decrease the number of reports to decrease the costs for the reporting entities without an additional risk of being sanctioned by the FATF. At the same time, those countries that have an insufficient amount of reports should increase the amount of reports to make it just above the blacklisting threshold. Section 7.3 illustrates how countries can (artificially) increase and decrease the amount of reports.

Figure 7.5. Effect of an objective blacklisting threshold for suspicion reports
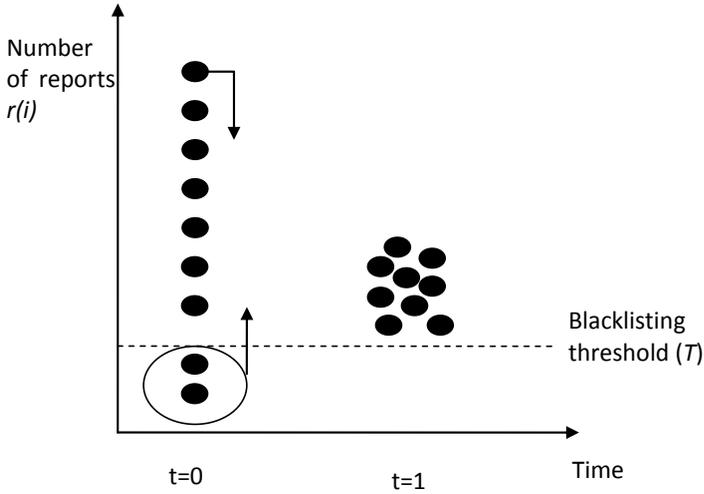
We learned from practice (see Section 7.1) that as soon as the blacklist of the FATF emptied, a new set of higher thresholds was set to blame the then least performing countries. This can basically be seen as a relative ranking with different blacklisting thresholds over time. Figure 7.6 illustrates what happens when countries are relatively ranked and only the worst performing countries are punished.

The FATF can increase the blacklisting threshold over time to keep pushing the countries to produce more and more reports. This increases the costs for the reporting entities in these countries and will result in more and more domestic pressure. As mentioned in the first paragraph of this section, the countries can engage in strategic behaviour to lower the costs for the reporting entities (or keep the costs low), while making sure this does not result in blacklisting. Section 7.3 analyses the behaviour of nine European countries in practice and shows possible strategic behaviour by countries.

Figure 7.6. Effect of a relative blacklisting threshold for suspicion reports

t=0   t=1   t=2   Time

- - - - - - - = Blacklisting threshold (T)
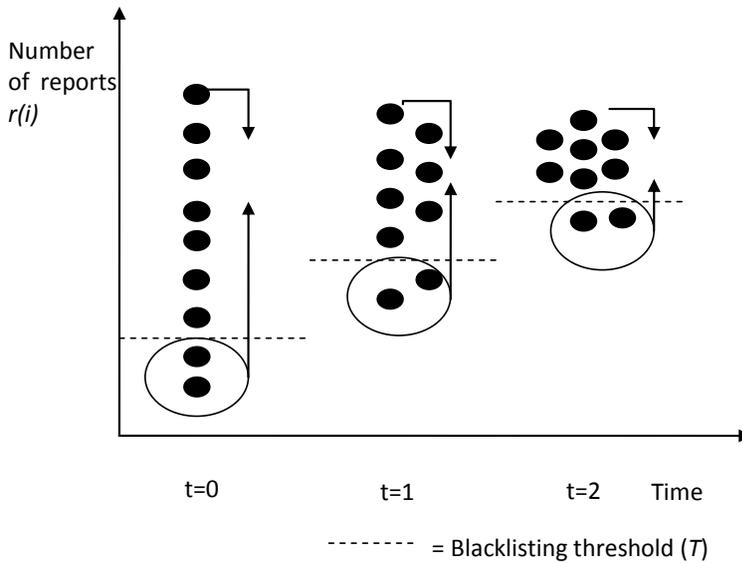
7.3. Case Study on the Reporting in Nine European Countries

The theoretic model of section 7.2 shows why countries might want to increase or decrease the number of reports. The first part of this section investigates to what extent countries try do so by changing the reporting threshold specified in their law. Countries can also try to clog up the view of the FATF, making it harder to rank countries, which is the focus of the second part of this section.

The most obvious way to increase the number of reports would be to lower the reporting threshold. The government would then change the law to stipulate that not all transactions above e.g. €20,000 should be reported, but that all transactions above €15,000 should be reported. This should directly lead to more reports. The opposite – increasing the reporting threshold – should directly lead to less reports. In order to find out whether reporting thresholds have been increased, because of domestic pressure, or decreased, in reaction to the international pressure by the FATF, we analyse the laws of a group of nine European countries (Denmark, Germany, Hungary, Latvia, The Netherlands, Poland, Slovenia, Switzerland and the United Kingdom).

[109]

Poland has increased its reporting thresholds for cash reporting. The AML Act 2000 speaks about registration of transactions of/above € 10,000 and Article 8 of the new AML Act changes this threshold to € 15,000[98]. In the Netherlands the threshold has increased from € 15,000 to € 25,000[99]. Similarly, the cash reporting threshold in Slovenia has been increased from approximately € 20,800 to € 30,000[100]. So of the countries that changed their reporting threshold all three have increased the threshold, which should lead to less reports. This confirms the results from our model in Section 7.2, if we assume that European countries are already the top performing countries. It could also be that the FATF's policy is ineffective so far and that the lobby groups of the reporting entities were able to put more pressure on their government.

In a principal-agent relation as presented in Section 7.2, it would be beneficial for the agent to hinder the principal in observing reality. In this section, we show that the suspicion reports that various European countries use are of a distinct nature and are therefore hard to compare for the FATF. We argue both from a legal and economic perspective that at the time being, countries' statistics on the number of reports disclosed to FIUs can actually not be compared with each other. But as we will show in two cases, the FATF still does so; sometimes the compliance scores of countries are lowered because the number of suspicion reports is too low.

The comparison itself is based on six aspects, namely the type of report (STR, UTR, CTR or SAR), the subjective grounds of suspicion (level of knowledge), the objective grounds of suspicion (reporting threshold), the definition of a transaction (narrow or broad), the inclusion of attempt and the data collection methodology of suspicion reports. The countries used in this comparison are again Denmark, Germany, Hungary, Latvia, the Netherlands, Poland, Slovenia, Switzerland and the United Kingdom. The comparison is deliberately restricted to the European territory, because it is presumed

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[98] See the Polish act that has been published online at: http://www.imolin.org/pdf/imolin/polact00.pdf
[99] This is specified in the list of indicators for the reporting entities, that is published online at: http://www.st-ab.nl/wettennr05/0556-01_Regeling_vaststelling_indicatorenlijst_ongebruikelijke_ transacties.htm

[100] See the Third Mutual Evaluation Report on Slovenia , published in 2005, on p. 86

that these countries have more or less the same international and European obligations (except for Switzerland), which creates a minimum level-playing field.[101] Furthermore, these specific countries have been chosen because of special reporting characteristics[102] or because they were used as a comparative country in a FATF assessment. [103] Altogether they provide an appropriate illustration and representation of differences on suspicion reports that exist between European countries. The complete result of the comparison can be found in Table 7.1.

There are 4 different types of suspicion reports. The most common type of report is the Suspicious Transaction Report (STR), which we could see as the norm. A Suspicious Activity Report (SAR) differs from a STR by the fact that supposedly not only transactions are reported, but also other activities, like opening a bank account under suspicious circumstances. An Unusual Transaction Report (UTR) differs from a STR by the fact that supposedly every unusual transaction (which is a broader concept than suspicious transactions) is reported. Then we also have Cash Transaction Reports, which only relate to transactions in cash. To make it even more difficult, an analysis on these type of reports shows that sometimes STRs are used for other activities than just transactions, and that the practical application of UTRs and STRs is not always as different as one expects. The names for these reports do thus not fully reflect the actual differences between the reports. What might be even more cumbersome is that in some countries multiple types of reports are used at the same time.

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[101] FATF Forty Recommendations and Nine Special Recommendations; Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing, OJ L 309, 25 November 2005, p. 15; and Commission Directive 2006/70/EC of 1 August 2006, laying down implementing measures for Directive 2005/60/EC of the European Parliament and of the Council as regards the definition of 'politically exposed person' and the technical criteria for simplified customer due diligence procedures and for exemption on grounds of a financial activity conducted on an occasional or very limited basis, OJ L 214, 4 August 2006, p. 29; Council of Europe, Convention on Laundering, Search, Seizure and Confiscation of the Proceeds from Crime and on the Financing of Terrorism (2005).

[102] For example: in Poland three types of reports are used; Latvia has both UTRs and STRs in place and the Netherlands only works with UTRs.

[103] For example: the FATF compared Germany, amongst other, with the United Kingdom in its Third Mutual Evaluation Report on Germany (2010) and Denmark, amongst others, was compared with Hungary and Switzerland in its Third Mutual Evaluation Report dating from 2006.

The level of knowledge that is needed before the reporting institution should report ranges considerably between the nine European countries, from substantiated suspicion – which almost means the institution should know that the transaction is money laundering – until anything unusual. Not all countries have reporting thresholds, but those that do, have completely different thresholds, it even happens that the thresholds within a country differs for different types of reporting institutions. As can be seen in Table 7.1, also the definition of a transaction and whether attempt should be reported differs in the nine countries we studied.

Table 7.1. Suspicion reports in European countries

Country	Report type	Level of knowledge	Reporting threshold	Transaction definition	Attempt included	Data collection
Denmark	STR	Suspicion (but only in case of suspicion of a criminal offence punishable by 1 year or more)	n.a.	Not defined in AML/CTF Act.	Yes, (indirectly)	One STR may contain several individual transactions
Germany	STR	Knowledge ("having established facts which permit the conclusion")	n.a.	"any act aimed at or resulting in a transfer of money or a similar movement of assets"	Yes	One STR may contain several individual transactions
Hungary	STR	Suspicion/ reasonable grounds to suspect	n.a.	Not defined in AML/CTF Act; but in practice "every fact or circumstance that may give rise to a suspicion"	Uncertain: no clear provision in AML/CTF Act	One STR may contain several individual transactions
Latvia	UTR	n.a.	Depends on type of obliged entity	Not defined in AML/CTF Act	n.a.	One UTR may contain several individual transactions
	STR	Suspicion	n.a.		Yes	One STR may contain several individual transactions
The Netherlands	UTR	Unusual (~ lower than reasonable grounds)	Differs for each category of reporting entities	"Operation or combination of operations by or on behalf of a customer in connection with	Yes	One UTR may contain several individual transactions

[112]

				the procurement or provision of services"		
Poland	STR	Suspicion / reasonable grounds to suspect	n.a.	The "performing of: a) deposits and withdrawals (…) b)buying and selling foreign currency, c) transfer of the ownership of asset values, (…) d) a claim for shares a claim for stock swap."	Yes.	One STR contains one transaction
	SAR		n.a.		Yes.	One SAR may contain several individual transactions
	(C)TR	n.a.	€ 15,000 (all transactions)		n.a.	One CTR may contain several individual transactions
Slovenia	STR	Reasonable grounds to suspect	n.a.	"any receipt, handover, exchange, safekeeping, disposal or other handling of monies or other property by a person liable"	Yes	One STR may contain several individual transactions
	CTR	n.a.	€ 30,000 (only cash transactions)		n.a.	One CTR may contain several individual transactions
Switzerland	SAR	Substantiated suspicion (founded knowledge)	n.a.	Not defined in AML/CTF Act.	Yes	One SAR may contain multiple transactions
United Kingdom	SAR	1. Knowledge 2. Suspicion 3. Reasonable grounds to know or suspect	n.a.	n.a.	Partially, only with regard to the regulated sector	One SAR may contain multiple transactions

Note: Table made by the authors. The sources of the information in this table can be found in Appendix 7.1.

The one apparent conclusion that we can draw from Table 7.1 is that the suspicion reports used in these nine European countries are different on many different aspects. It might therefore not be a surprise that the actual number of suspicion reports in these nine countries is very different, as shown in Table 7.2.

Table 7.2. Number of suspicion reports in nine European countries in 2008

Country	STRs	UTRs	SARs	CTRs
Denmark	1,553			
Germany	7,349			
Hungary	9,940			
Latvia	23,963	20,514		
The Netherlands		295,464		
Poland	1,290		1,815	34,800,000
Slovenia	192			24,371
Switzerland			851	
United Kingdom			221,466	

We might be able to partly explain the differences in the statistics based on the characteristics shown in Table 7.1 and make comparisons with the different characteristics in mind. But one characteristic is less transparent than the other characteristics; the data collection method. It is therefore that this characteristic is the most prominent candidate for countries to artificially influence their statistics. All the other characteristics are written down in the law or at least in formal – and normally public – guidelines. The calculation method within a country can however easily be changed without any public notice, e.g. by changing one particular PowerPoint slide of the presentation of the team that trains the reporting entities in the country. As one can see in Table 7.1, we were unable to find out whether there are big differences in the data collection method, simply because it is less transparent and harder to compare.

We can conclude that given the large variety in type of reports and definitions, comparing countries on the number of reports is completely impossible for the FATF. Even though the FATF admits that there is no good comparative basis for comparing countries, the FATF made the comparison nonetheless. We show two examples.

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[104] Some statistics were missing in the Eurostat report (the number of UTRs in Latvia, SARs and CTRs in Poland and the CTRs in Slovenia), and found by the authors via a survey or the annual report of the FIU and the number of reports in Hungary were wrong in the Eurostat report. While Eurostat reports that the amount of STRs in 2007 is 13 and in 2008 is 62, this is, according to the Hungarian representatives, probably the number of cases forwarded by the FIU to the LEAs. The actual number of STRs received by the Hungarian FIU is 9480 in 2007, 9940 in 2008 and 5440 in 2009.

In the Third Mutual Evaluation Round on the Kingdom of Denmark, the FATF compared the Danish level of reporting on the basis of statistics with a great number of other European and non-European countries. The FATF mentioned the fact that a comparison only on absolute numbers would not provide a good comparative basis, but still undertook this comparison.[105] The FATF concluded that the number of reports was significantly lower in Denmark than in the compared countries. Although the statistics were not a conclusive factor, the FATF noted the low level of STR reporting as a deficiency to Recommendation 13 that consequently lowered the compliance rate. Two of the countries with which Denmark was compared were Hungary and Switzerland. While the number of reports in 2004 for Hungary was 14,120, the Danish number of reports was 413. Although this divergence is considerable indeed, it is not surprising when looking at the definition of STRs in those countries. While in Denmark the level of knowledge for reporting is based on a suspicion of money laundering in connection with a criminal offence punishable by imprisonment of one year or more, (FATF, 2006, p.116) the applicable AML/CTF Act in Hungary at that time spoke of "any data, facts or circumstances indicating money laundering", thus setting a lower threshold of suspicion than in Denmark.[106] (Moneyval, 2005, p.42) This may explain the different reporting numbers and shows that the FATF should not compare the absolute number of reports only.

In the German FATF evaluation of 2010, the FATF expressed its concerns about the effectiveness of the German reporting system. It compared the absolute number of reports with those in France, Italy, the United Kingdom and Canada. These countries were chosen because they are "FATF member countries with a substantial financial sector". (FATF, 2010, p.170) The table in the evaluation report showed that the number of reports in the United Kingdom diverged considerably from the number of reports in Germany (in 2008 210,524 reports in the UK against 7,312 reports in Germany). (FATF, 2010, p.170) As indicated in Table 7.1 various factors can explain this difference. For example, one sees

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[105] In fact, it then continued comparing the number of STRs by commercial banks, arguing that those institutions would be defined similarly across the countries and have more experience with AML/CTF reporting. See FATF (2006), *Third Mutual Evaluation Report on the Kingdom of Denmark*, p. 116-117.
[106] The definition in the current AML/CTF Act has remained unchanged in this respect.

that the level of knowledge required for disclosing a report to the competent authorities is actually somewhat higher in Germany. Moreover, in the United Kingdom any activity has to be reported, while the reporting obligation in Germany is confined to transactions. What does not become directly clear from the table but which is an interesting difference with the reporting obligation in Germany, is that in the United Kingdom the basis for reporting lies in several provisions of the Proceeds of Crime Act (POCA), hence criminal law. From the four applicable provisions (Sections 327-330 POCA), the first three relate to all people and not only to the institutions subject to the Money Laundering Regulations 2007. Therefore, the scope of application is considerably wider in the UK than in Germany, where only institutions subject to the AML/CTF Act have to (send a copy of the) report to the FIU. Moreover, when the German reporting system was compared with some of their neighbours, like Switzerland and Denmark, one would draw the exact opposite conclusion and increase the German compliance score instead of lowering it. Also here, it can be concluded that due to the various differences of the reporting systems in Germany and the United Kingdom, the absolute number of reports cannot be compared with each other.[107]

7.4. FATF's Different Policy Options for the Future

Section 7.3 makes clear that comparing the number of suspicion reports between countries does not have a sound basis. We see three possible policy options for the FATF for the future.

The FATF can push for a uniform legislation such that the notion of a report is a uniform concept in all the countries in the world. This of course needs to be done by means of legislative changes, which takes time and effort, and political negotiations are involved. Changing the classification schemes of administration might involve other policy fields as well and might be very difficult.

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[107] The FATF indeed considered the fact that variation in reporting levels is due to differences in the regime design and methods used to count STRs, but it concluded that the German number of reports was so low, that assessors found it difficult to conclude that the German system was adequate. (FATF, 2010, p.171)

Alternatively, we propose a restructuring of the current units of measurement such that they are better comparable across countries, more specifically: measure and compare the amount of money and the number of natural persons involved in the suspicion reports, instead of the number of reports. Clearly there will still be some degrees of freedom on how to interpret money laundering tasks and time devoted to it, but it at least takes away the differences in the data collection method, which is the least transparent characteristic of the current suspicion reports.

Another way of finding out what countries really do might be a bottom up approach. The FATF could do some, what we can call, 'mystery shopping'. An idea based on how the customer service of shops can be tested. One executes money laundering operations in each country to see which transactions the authorities detect by and whether this detection leads to a conviction. Evidently, the type of transaction and number of repetitions of the transaction has to be clearly defined and adjusted to the country size to avoid sample selection biases.[108] Furthermore, the legal ground for such actions must be arranged. But it would be a first step to get out of studying fake statistics that bureaucrats make for other bureaucrats and to start facing reality.

7.5. Conclusion

In the international fight against money laundering and terrorist financing the Financial Action Task Force (FATF) evaluates countries' anti-money laundering policies. One of the parameters it uses is the number of reports on a suspicion of money laundering that the Financial Intelligence Unit in each country receives. With this measure, the FATF tries to differentiate countries on the basis of the responsiveness of their financial and non-financial sectors to the money laundering threat. The underlying assumption is that an increased responsiveness is the result of an effective policy. Thereby, countries that have more reports are regarded more effective in the fight against money laundering.

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[108] We owe this point to Erhard Blankenburg and to Loek Groot

We show by means of a principal-agent model, that countries are faced with opposing international and domestic pressures and that as a result of this, strategic behaviour can occur – namely pressure groups can push for legislative changes whereby national statistics are altered in such a way that the FATF cannot punish the country for non-compliance and the reporting entities are not overburdened with costly reports.

Consequently, we argue that the actual reporting statistics used by the FATF are not appropriate for comparing country specific anti-money laundering efforts. When looking at the possibilities for defining a report, we show that too many degrees of freedom make a cross-country comparison of suspicion reports impossible at the moment. We studied nine European countries to give some empirical examples: one and the same report can be counted differently, one and the same report can refer to very different market behaviour and cash transactions above certain thresholds will be reported in some countries whereas they will not in others.

The FATF now has three policy options to overcome this possible strategic behaviour of countries. They could harmonize the definition of a suspicion report in all the countries in the world, although this will be a lengthy and cumbersome exercise. Alternatively, the FATF would be better off by not measuring the number of suspicion reports itself, but by using the statistics on the amount of money and number of persons involved, so that at least the different definitions of a suspicion report do not clog up their view. Finally, we propose a completely different approach, which we call mystery shopping. The FATF could make suspicious transactions in every country and observe whether the relevant authorities uncover them to measure the responsiveness in each country directly.

Chapter 8. Summary and Conclusions

Money laundering, in short can be said to be the disguise of the illegal origin of money. Money laundering has been studied for many years by mainly lawyers and criminologists. This dissertation shows how an economist (in a multidisciplinary fashion) can answer the four most prominent questions on money laundering.

Why is money laundering an issue?

If a criminal has to launder his criminal proceeds before he can freely spend them, this gives law enforcement agencies a second chance to catch the criminal. Even if the predicate crime cannot be proven, imprisonment for money laundering and confiscation of the criminal assets is possible. Moreover, the literature mentions 24 different indirect effects that money laundering can have on the real and financial sector. Chapter 3 gives an overview of these effects. Money laundering can affect the real economy by distortion of consumption, savings, investment, inflation, competition, trade and employment. Furthermore, money laundering can affect the financial sector with an increased risk on the solvability, liquidity, reputation and integrity of the sector. But money laundering could also be beneficial for the economy through increased profits for the financial sector and a greater availability of capital. Unfortunately, there is not much empirical back-up on these effects and it is therefore still uncertain whether money laundering would have a positive or negative effect on the economy in the long run. It is quite hard to estimate these effects empirically as the main component for such an empirical analysis is unknown: the amount of money laundering. Nevertheless, Chapter 4 shows that it is still possible to estimate effects of money laundering.

The literature suggests that money laundering could increase crime. Money laundering makes criminal activities worthwhile and provides criminal organizations with capital they can use to further expand their criminal activities. To empirically test this relationship between money laundering and the general level of crime, one needs data on the amount of money laundering and the amount of crime. Although it is quite cumbersome to measure the amount of crime, there is some reliable data available, but

for money laundering this data simply does not exist. To circumvent the need for money laundering data, an assumption in Chapter 4 is that anti-money laundering policy reduces the amount of money laundering. This makes it possible to test the effect of money laundering indirectly. Since cross-country comparable data on anti-money laundering policy is also not available, we construct an index for the anti-money laundering policy of 17 countries on 40 different policy aspects. The econometric tests with this data show indeed that more intense anti-money laundering policy, especially in terms of international cooperation, is associated with a lower crime level. This result is consistent with the idea that we can make crime less worthwhile by fighting money laundering.

How is money laundered?

Money laundering can take many forms. One of the more simple forms is by adding dirty money to the cash drawer of your cash-intensive business, like your bar, your restaurant or – to mention the business that gave money laundering its name – your launderette. Another quite simple form of money laundering is pretending that you won the money. You can for instance go to a casino and buy a lot of chips, handing them in later pretending you won them. These simple forms of money laundering have, among others, the disadvantage that they only work for relatively small amounts of money. The traditional way to launder big sums of money is through the financial sector. The idea is that you start with making sure the money enters the financial sector – although this is not always necessary for certain crimes, like fraud and cybercrime. Consequently, you transfer this money around the world with an indecipherable web of wire transfers, private loans, false payments, trusts and offshore companies until the source of this money is completely disguised. Most of the current anti-money laundering policy seems to focus on this type of money laundering. A relatively recent discovered type of money laundering that gets less attention in the current anti-money laundering policies is trade-based money laundering. This form of money laundering is based on falsifying import and export prices to make seemingly legal profits. Chapter 5 of this dissertation studies trade-based money laundering in detail.

The conclusion of chapter 5 is that a model based on the gravity equation of Isaac Newton can explain trade-based money laundering flows. Newton discovered that the gravity force between two objects depends on the mass of the objects and the distance between them. Similarly, Chapter 5 shows that trade-based money laundering flows are bigger between countries with more mass (measured in GDP) and between countries with less distance to each other. Furthermore, our empirical results suggest that money launderers, that want to send their money to countries that fiercely fight money laundering in the financial sector, use trade-based money laundering as an alternative. A anti-money laundering policy that tackles the different money laundering methods more evenly would therefore be preferable.

Where does all this laundered money go?

Estimates of the amount of money laundering suggest figures between 2 and 5% of GDP. It is hard to imagine that such amounts of money reappear in the legal economy almost unnoticed. The question therefore arises where all of this money could end up. Chapter 6 analyses one of the prominent candidates: the real estate sector. This sector is large enough to absorb a large part of this money, and is prone to money laundering because of features such as the heterogeneity of buildings, the non-transparency in the market and possibilities for hiding the true owner. So far, however, no systematic study has been conducted on the importance and frequency of money laundering in the real estate sector.

Chapter 6 shows that with a multidisciplinary approach of economics and criminology one can develop an indicator-based detection model for money laundering in the real estate sector. This study combines several databases to analyse the whole real estate market in two Dutch cities. We retrieve from the literature 17 indicators for money laundering in the real estate sector and apply them to our dataset of 11,895 real estate objects. After a criminological analysis of 200 of these objects, we found 36 conspicuous cases. This data is used in an empirical analysis which concludes that there are three remarkable characteristics of a real estate object that are associated with a significantly higher chance that money laundering is involved: price fluctuations, the involvement of

just-established companies and foreign owners of real estate. The draft 'magic formula' that we estimate suggests that real estate with an unusual price fluctuation has a 25 %. higher chance to be conspicuous, while the involvement of just-established companies and foreign owners is related to a 24%. and 15%. higher chance, respectively. Applying such a 'magic formula' systematically to all real estate could give us an insight on how prone this sector is for money laundering.

How can we fight money laundering?

Money laundering often has a cross-border component, probably because this adds a layer of disguise and because other countries might have a more tolerant attitude towards money laundering. The international component of the fight against money laundering is therefore important, because if one country neglects its responsibility to fight money laundering, the efforts of all the other countries in the world are rather useless. The FATF – an intergovernmental body established by the G-7 countries – takes the lead in the international fight against money laundering and strives to involve all countries in the world. At the moment, almost all countries are member of the FATF or one of its regional style bodies. The strategy of the FATF is based on two pillars: setting the standards in anti-money laundering policy and evaluating countries on the implementation of these standards. The FATF standards and evaluations are not based on hard law, but on recommendations. However, since the FATF uses soft law instruments like blacklisting, basically all countries of the world more or less 'voluntarily' had themselves evaluated and aim at complying with the FATF standards. The FATF mutual evaluations were checking mostly law in the books at first, but are now more and more on law in action. Evaluating law in action is a cumbersome task. In every country, the financial sector (and other obliged entities like notaries, lawyers, jewellers and car dealers) has to report suspicious transactions that can be related to money laundering. At the moment the evaluations of the FATF are based on statistics like the number of such suspicion reports.

Chapter 7 shows that the current situation with FATF evaluations can be modelled as a principal-agent problem with strategic behaviour, where the principal (the FATF) cannot

observe the actual behaviour of the agents (the countries) and tries to measure this indirectly. The idea of the FATF seems to be that the number of suspicion reports indicates the responsiveness of the market to the threat of money laundering. We show that the FATF compares the number of suspicion reports across countries, while there is no solid ground for such a comparison, because the suspicion reports differ internationally on many aspects. It could be that a money laundering operation would lead to only one suspicion report in one country, while it would lead to dozens of suspicion reports in another country. With strategic behaviour, countries can influence the statistics that are used in the evaluations, to make their effort seem better than it actually is. We conclude that the FATF has three policy options to limit this strategic behaviour. First, they can try to push for a universal definition of a suspicion report, but this would be a lengthy and complicated task. Alternatively, the FATF would be better off by not measuring the number of suspicion reports itself, but by using statistics on the amount of money and number of persons involved, so that at least the different definitions of a suspicion report do not clog up their view. But eventually we think that it might be better to opt for a completely different approach. We suggest a policy option based on what we call *mystery shopping.* The idea is that one carries out a number of money laundering transactions in every country to see whether the authorities detect these transactions.

Chapter 9. Limitations and Further Research

Although this dissertation is a serious step towards a better understanding of money laundering, its effects and the policy towards it, I don't think we are even close to a full understanding of these topics. Therefore, this chapter on limitations and further research is an important part of this dissertation.

Chapter 4 empirically tests the relation between anti-money laundering policy and crime. Further empirical tests will have to examine whether the hypothesis can also be confirmed when including more countries in the dataset or when using more and/or different control variables. Updated data based on the recent reports of the FATF would make it possible to test the robustness over time of this effect. Further research that can test the causality of the effect, by showing Granger causality or using instrumental variables, would have a great deal of added value. There is hope that the efforts of the FATF will improve the quality of the mutual evaluation reports in the future (see Chapter 7 of this dissertation), which would in turn lead to an improvement of the results of this type of research. Furthermore, we should realize that Chapter 4 empirically tests only one of the 25 effects of money laundering that are listed in Table 1.1. Further research on the other 24 effects of money laundering would make it eventually possible to determine whether the net effect of money laundering is positive or negative and whether we should be bothered by money laundering. To take the next step towards a complete cost-benefit analysis, statistics or estimations on the costs of money laundering policy would be needed.

Chapter 5 analyses the behaviour of US-based criminals that use trade-based money laundering. This type of analysis seems fruitful and gives interesting insights. The estimation model in this chapter could benefit a lot by adding a time dimension and other variables that could be related with trade-based money laundering and trade, such as tax agreements, diplomatic relationships and other politics-related variables (as e.g. done in Zhang, Witteloostuijn and Elhorst, 2011). Moreover it would be interesting to conduct a similar analysis for other forms of money laundering, but before this is possible we need estimations for these types of money laundering that are estimated such as the data we

use from Zdanowicz: the estimation method must be independent of the other estimation models. Finally, note that the estimations of trade-based money laundering are not perfect estimations. The abnormal prices can also indicate typographical errors or transfer pricing by multinational firms. The typographical errors will not affect our results as long as they are randomly distributed, since we correct for the size of trade in our final estimation model. Illegal transfer pricing may be included in the trade-based money laundering estimates of Zdanowicz.

Chapter 6 analyses money laundering in the real estate sector and shows that three remarkable characteristics are related to a higher chance for the object to be conspicuous. Note that these significant relationships are not causal per se; a characteristic could lead to criminal activity, but criminal activity could also lead to a certain characteristic. Also note that it is not clear to what extent we can generalise the results, since the sample is fairly small (200 objects) compared to the whole sector (11,895 objects), and not random and therefore normally not representative. We hope, however, to have demonstrated that using a multidisciplinary approach including outlier detection, criminology and econometrics is a promising method to create a detection tool for criminal investments in the real estate sector. However, it needs further refinement. Refinement can be achieved by focusing on more narrow concepts of criminal behaviour (e.g. specific forms of fraud or drugs), specific real estate sub-sectors (e.g. housing or commercial market) and by the mere use of behaviour-specific indicators. Actually, any similar type of analysis would be beneficial to get some insight in the robustness of the results. It would also be interesting to know whether law enforcement agencies agree with the conspicuousness of the real estate objects we identified and whether they would see enough ground for prosecution. Furthermore, a similar type of analysis could be performed on other sectors to get an idea what the relative frequency of money laundering in the real estate sector is, we now lack estimates on other sectors for a comparison.

Chapter 7 models the current practice in the international fight against money laundering as a principal-agent problem with strategic behaviour. We sketch three possible policy options for the future, of which 'mystery shopping' is radically different

from the current practice. However, we did not delve further into this interesting policy option. Questions on the practical application of mystery shopping remain unanswered, like: who pays for it? Is there a legal ground for such an approach? And if not, can this legal ground be created in the future? How effective would mystery shopping be? A tip-off of one of the involved parties ruins the effectiveness of this evaluation method, which raises the question: How do we prevent tipping-off?

Since money laundering is a newly established field in economics, there are still many questions to be raised and answered. I hope to have shown with this dissertation how multidisciplinary economic research can contribute to this growing field and hope that in the future more economists will engage in this multidisciplinary topic.

Appendices

A4.1. Model and Proof of the Economics of Crime and Money Laundering

To model the reasoning of the economics of crime and money laundering, the model Becker (1968) presented on the expected utility of criminal behaviour and the supply of offenses is adjusted.

Figure A4.1. The sequential possibilities for a criminal and the corresponding utilities
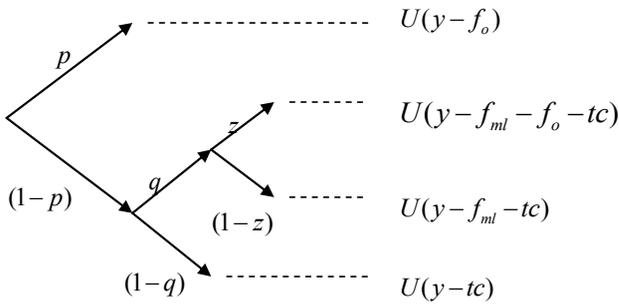
Figure A4.1 is used to calculate the expected utility the potential criminal receives for a specific criminal act (see equation A4.1).

$$EU = pU(y-f_o)+(1-p)qzU(y-f_{ml}-f_o-tc)+(1-p)q(1-z)U(y-f_{ml}-tc) \tag{A4.1}$$
$$+(1-p)(1-q)U(y-tc)$$

If positive marginal utility from income is assumed it can be shown that

$$\partial EU / \partial p = U(y-f_o)-qzU(Y-f_{ml}-f_o-tc)-q(1-z)U(Y-f_{ml}-tc)$$
$$-(1-q)U(y-tc) < 0 \tag{A4.2}$$

$$\partial EU / \partial q = (1-p)zU(y-f_{ml}-f_o-tc)+(1-p)(1-z)U(y-f_{ml}-tc)$$
$$-(1-p)U(y-tc) < 0 \tag{A4.3}$$

$$\partial EU / \partial z = (1-p)qU(y - f_{ml} - f_o - tc) - (1-p)qU(y - f_{ml} - tc) < 0 \qquad \text{(A4.4)}$$

$$\partial EU / \partial f_o = -pU'(y - f_o) - (1-p)qzU'(y - f_o - f_{ml} - tc) < 0 \qquad \text{(A4.5)}$$

$$\partial EU / \partial f_{ml} = -(1-p)qzU'(y - f_{ml} - f_o - tc) - (1-p)q(1-z)U'(y - f_{ml} - tc) < 0 \quad \text{(A4.6)}$$

$$\partial EU / \partial tc = -(1-p)qzU'(y - f_{ml} - f_o - tc) - (1-p)q(1-z)U'(y - f_{ml} - tc)$$
$$-(1-p)(1-q)U'(y - tc) < 0 \qquad \text{(A4.7)}$$

with *EU* as the expected utility gained from a criminal act, *U* as a (von Neumann-Morgenstern) utility function,[109] and p,[110] f_o, q, f_{ml}, z and tc[111] as noted in the main text on the economics of crime and money laundering.

By using the averages of all the values for p, f_o, q, f_{ml}, z and tc (like Becker, 1968), the 'market offense function' can be presented, in reduced form, as:

$$O = O(\overline{p}, \overline{f_o}, \overline{q}, \overline{f_{ml}}, \overline{z}, \overline{tc}, \overline{u}) \qquad \text{(A4.8)}$$

with *O* as the total number of offenses (excluding money laundering[112]) and *u* as the average of all other influences.

The relation of all the factors in the 'market offense function' is shown to be negative by equations (A4.2) through (A4.7), except for *u*. Equation (A4.9) describes these

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[109] Von Neumann-Morgenstern utility functions are commonly used in economics to make calculations with the utility functions easier.

[110] Note that the offenses in this model are split into two categories; money laundering and all other offenses. p and f_o refer to the 'initial offense' meaning 'all offenses except money laundering.'

[111] These transaction costs could be the rewards for other persons and therefore an incentive to become a money launderer. This could have its effect on the expected value of laundering money, which could have an effect on the number of individuals that prefer the illegal act of money laundering above other, (il)legal acts. The number of offenses in this model excludes the illegal act of money laundering, so this relation does not blur the model.

[112] The analysis on the economics of crime and money laundering stated the assumption that money laundering is illegal; this would double the amount of illegal acts if the profit from every crime were to be laundered. This will blur the picture and, therefore, the word offenses will be used, which must be read as excluding the illegal act of money laundering.

relations, four of these (q , f_{ml} , z and tc) will be used as the hypothesis for the empirical estimation (these relations are shown in Figure 4.1).

$$O = O(\overline{p}, \overline{f_o}, \overline{q}, \overline{f_{ml}}, \overline{z}, \overline{tc}, \overline{u})$$

$$(-)(-)(-)(-)(-)(-)(\pm)$$

(A4.9)

A4.2. Short Description of the Different Recommendations

Table A4.1. Short description of the different recommendations

Recommendation	Short description / keywords regarding the content
1	Criminalize ML, on basis of Palermo/Vienna Convention
2	Prove ML, apply to legal persons and penalties
3	Make confiscation of ill-gotten gains possible
4	No secrecy laws
5	Consumer Due Diligence (CDD), know your customer
6	Special CDD for Politically Exposed Persons (PEPs)
7	Special CDD for cross-border correspondent banking
8	Monitor for new developments leading to anonymity
9	Rely on third parties for CDD
10	Record-keeping
11	Special attention to complex, unusually large transactions
12	CDD for Designated Non-Financial Businesses and Persons (DNFBP)
13	Report to Financial Intelligence Unit (FIU)
14	Employee protection and professional secret
15	Financial Institutions (FI) develop internal policy, training and audit
16	R. 13-15 and R. 21 for DNFBPs
17	Sanction possibility for non-compliance
18	Shell banks should be prohibited
19	One central database for currency transactions
20	Recs to all businesses & development techniques money management
21	Special attention business relations transactions with NCCTs
22	Special attention to branches located abroad, especially NCCTs
23	Regulation, supervision and licensing FI
24	DNFBPs should be supervised
25	Establish guidelines and feedback
26	Establish a financial intelligence unit (FIU)
27	Responsibility and develop new techniques for law enforcement
28	Ability to obtain information by competent authorities
29	Supervisors should have adequate powers
30	Adequate resources for competent authorities
31	Domestic cooperation between FIU, law and supervisors
32	Review effectiveness with statistics
33	Prevent unlawful use legal persons (bearer shares/beneficial owner)
34	Special CDD to trust offices
35	Become party of and implement specific conventions
36	Provide range of Mutual Legal Assistance (MLA)
37	Dual criminality
38	Respond to foreign request to freeze, seize and confiscate
39	Recognize ML as extraditable offense
40	International cooperation with counterparts

A4.3. Descriptive Statistics

Table A4.2. Descriptive statistics of the variables used in the estimated equation

Variable	Nr[*]	Mean	Std. dev.	Min	Max	Skewness	Kurtosis
Dependent variable							
Crime	102	7175	3233	1930	13693	0.12	2.12
Independent variables on anti-money laundering policy							
Legal	17	15.6	3.0	8	20	-0.65	3.16
Public	17	35.5	3.8	27	43	-0.54	3.45
Private	17	47.2	15.6	27	43	-0.46	1.89
International	17	32.6	2.9	26	38	-0.54	2.98
Control variables							
Corruption	17	1.72	0.5	0.67	2.35	-0.71	2.56
Enforcement	17	0.57	0.42	0	1	-0.32	1.49
GDP p/c	102	23059	6160	11317	48217	1.11	5.98

Source: calculated by the author. Common law is not included in the table since it is a dummy variable. Australia, Ireland, United Kingdom and United States are the common law countries in this dataset. [*]Nr stands for number of observations.

A5.1. Descriptive Statistics and Greater Details of the TBML Data

Table A5.1 Descriptive statistics of trade, TBML and explanatory variables of 200 countries (2004)

	Unit	Mean	Sd	Median	Nr[*]	Min	Max	Skewness	Kurtosis
Total TBML	US$, logs	17.65	3.41	17.64	200	8.33	24.41	-0.16	2.52
TBML into the US	US$, logs	16.72	3.50	16.61	199	6.68	23.97	-0.08	2.65
TBML out of the US	US$, logs	17.00	3.40	17.27	200	7.41	23.63	-0.19	2.36
Trade	million US$, logs	6.39	2.68	6.16	200	-2.32	13.00	0.04	2.76
GDP per capita	million US$, logs	9.85	2.57	10.02	199	-1.35	15.69	-0.52	3.96
Financial system deposits	share of GDP, logs	0.29	0.30	0.23	199	0.00	2.17	1.89	10.09
Distance to US	km	8.92	0.55	9.02	200	6.31	9.69	-1.20	4.93
Corruption index (Walker)		3.83	0.98	4.00	200	1.00	4.93	-1.15	3.69

[*] *Nr stands for number of observations.*

Table A5.2 Descriptive statistics of the attractiveness term by Walker and Unger

Walker data variables	Nr[*]	Unger data variables	Nr[*]
Bank secrecy equals 1 (*no bank secrecy*)	134	Bank secrecy equals 1 (*no bank secrecy laws*)	103
Bank secrecy equals 2	21	Bank secrecy equals 2	46
Bank secrecy equals 3(*strict bank secrecy*)	45	Bank secrecy equals 3	14
		Bank secrecy equals 4 (*bank secrecy laws enforced*)	36
Government attitude equals 1 (*hostile*)	25	Government attitude equals 1 (*hostile*)	30
Government attitude equals 2	35	Government attitude equals 2	70
Government attitude equals 2.5	7	Government attitude equals 3	90
Government attitude equals 3	60	Government attitude equals 4	4
Government attitude equals 4 (*tolerant*)	73	Government attitude equals 5 (*tolerant*)	5
No swift membership	45	No swift membership	12
Swift membership	154	Swift membership	187
Conflict level equals 1 (*peaceful country*)	118	Conflict level equals 1 (*no conflict*)	122
Conflict level equals 2	49	Conflict level equals 2	29
Conflict level equals 3	21	Conflict level equals 3	28
Conflict level equals 4 (*heavy conflict*)	12	Conflict level equals 4	17
		Conflict level equals 5 (*conflict situation*)	3
		Corruption level equals 1 (*low corruption*)	17
		Corruption level equals 2	17
		Corruption level equals 3	39
		Corruption level equals 4	120
		Corruption level equals 5 (*high corruption*)	6
		Non-member of Egmont group	112
		English is not an official language	137
		Colonial relationship with US	6

[*] *Nr stands for number of observations.*

Table A5.3. Under- and overvaluation of US exports and imports with 25 countries (2004; billion US$)

	UEX	OIM	ML^{OUT}	UIM	OEX	ML^{IN}
Column	1	2	3	4	5	6
Australia	0.9	0.9	1.8	1.2	1.0	2.2
Canada	11.0	7.3	18.3	6.5	15.1	21.6
Denmark	1.5	0.4	1.9	0.1	0.6	0.7
France	1.3	1.3	2.6	2.2	0.9	3.1
Germany	6.4	5.4	11.8	2.7	22.8	25.5
UK	7.6	2.5	10.1	2.9	13.4	16.2
Italy	1.5	1.5	3.0	0.8	8.6	9.4
Japan	8.2	6.0	14.1	3.6	22.0	25.6
Netherlands	2.6	0.5	3.1	2.4	3.1	5.5
Norway	0.5	0.2	0.8	0.1	0.5	0.6
Switzerland	2.3	0.7	3.0	0.4	4.3	4.7
Luxembourg	0.100	0.009	0.108	0.020	0.019	0.039
Monaco	0.000	0.001	0.001	0.000	0.009	0.009
Lichtenstein	0.000	0.018	0.018	0.001	0.009	0.010
Barbados	0.099	0.001	0.100	0.014	0.086	0.100
China	6.0	7.8	13.8	2.6	17.7	20.3
Malaysia	2.3	1.2	3.5	1.7	3.5	5.2
Philippines	3.4	0.5	3.9	1.1	0.7	1.8
Taiwan	3.1	1.7	4.8	2.4	4.1	6.4
Mexico	8.8	4.2	13.0	5.3	9.4	14.7
Russia	0.5	0.2	0.7	0.1	0.4	0.5
Senegal	0.005	0.000	0.005	0.009	0.000	0.009
Liberia	0.001	0.033	0.034	0.001	0.003	0.004
Botswana	0.002	0.006	0.007	0.001	0.006	0.007
Cameroon	0.001	0.024	0.025	0.005	0.001	0.007
Rest of world	45.8	15.9	61.6	15.5	48.7	64.1
Total for US	111.6	56.2	167.8	48.1	175.2	223.3

Note: The variables are undervalued US exports (UEX), overvalued US imports (OIM), their sum (ML^{OUT}), overvalued US exports (OEX), undervalued US imports (UIM), and their sum (ML^{IN}).

Table A5.4. Under- and overvaluation of US ex- and imports as share of total US under- and overvaluation for 25 countries (2004)

	uex	oim	ml^{out}	uim	oex	ml^{in}	ex	im
Column	7	8	9	10	11	12	13	14
Australia	1.6	0.5	1.2	0.6	1.7	0.8	1.7	0.5
Canada	9.9	12.9	10.9	8.6	13.5	9.7	23.0	17.4
Denmark	1.3	0.8	1.1	0.4	0.2	0.3	0.3	0.3
France	3.5	2.9	3.3	4.8	2.5	4.3	2.6	2.2
Germany	5.7	9.7	7.1	13.0	5.6	11.4	3.8	5.3
UK	6.8	4.4	6.0	7.6	6.0	7.3	4.4	3.2
Italy	1.4	2.7	1.8	4.9	1.6	4.2	1.3	1.9
Japan	7.3	10.6	8.4	12.6	7.5	11.5	6.7	8.8
Netherlands	2.3	0.9	1.8	1.7	5.0	2.5	3.0	0.9
Norway	0.5	0.4	0.5	0.3	0.2	0.3	0.2	0.4
Switzerland	2.0	1.3	1.8	2.4	0.9	2.1	1.1	0.8
Luxembourg	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Monaco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lichtenstein	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barbados	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
China	5.4	13.9	8.2	10.1	5.4	9.1	4.3	13.4
Malaysia	2.1	2.1	2.1	2.0	3.5	2.3	1.3	1.9
Philippines	3.0	0.9	2.3	0.4	2.3	0.8	0.9	0.6
Taiwan	2.8	3.0	2.9	2.3	4.9	2.9	2.7	2.4
Mexico	7.9	7.5	7.7	5.4	10.9	6.6	13.6	10.6
Russia	0.4	0.4	0.4	0.2	0.3	0.2	0.4	0.8
Senegal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liberia	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Botswana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cameroon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of world	41.0	28.3	36.7	27.8	32.2	28.7	33.0	31.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: For the variable names in Columns 7-12, see note below Table A5.3. Lower cases point to shares. For the last two columns: the countries' shares in US exports (ex) and US imports (im)

Table A5.5. Ratios of US TBML outflows and licit US exports for 25 countries (2004; billion US$)

	uexr	oimr	uimr	oexr
Column	15	16	17	18
Australia	0.93	0.89	1.17	0,99
Canada	0.43	0.74	0.50	0.59
Denmark	4.95	2.92	1.34	0.84
France	1.34	1.34	2.21	0.95
Germany	1.49	1.84	2.48	1.45
UK	1.55	1.40	2.42	1.35
Italy	1.05	1.39	2.58	1.19
Japan	1.10	1.21	1.43	1.12
Netherlands	0.77	1.09	2.04	1.69
Norway	2.44	0.89	0.69	0.91
Switzerland	1.80	1.65	3.09	0.77
Luxembourg	1.03	0.77	0.53	0.49
Monaco	0.01	0.63	3.45	0.02
Lichtenstein	0.11	1.65	0.27	1.11
Barbados	2.09	0.58	19.60	0.67
China	1.27	1.04	0.76	1.27
Malaysia	1.56	1.12	1.05	2.63
Philippines	3.52	1.47	0.67	2.60
Taiwan	1.04	1.28	0.98	1.86
Mexico	0.58	0.70	0.51	0.81
Russia	1.20	0.55	0.30	0.69
Senegal	0.39	0.10	0.02	1.65
Liberia	0.10	10.38	0.27	0.35
Botswana	0.24	2.01	0.66	0.29
Cameroon	0.05	2.03	0.04	0.94
Rest of world	1.24	0.90	0.89	0.98

Explanation: Canada with a 9.9 percent share of total US TBML outflow through undervalued exports and a share of 23 percent in US exports has a ratio of 0.43. Ratios below 1 indicate relatively little TBML while ratios above 1 reflect relatively more TBML.

A5.2. The Calculations Behind the Lorenz Curves

The total outflow of TBML from the US consists of the sum of undervalued US exports (denoted by *UEX*) and overvalued US imports (*OIM*), so $ML^{OUT} = \sum_i^n (UEX_i + OIM_i)$, where the subscript *i* is the country index.[113] This total corresponds to the upper-left hand cell in Table 5.2. Throughout, we use absolute values for undervaluation so that TBML is always positive. Analogously, we define overvalued US exports (*OEX*) and undervalued US imports (*UIM*) and their sum total: $ML^{IN} = \sum_i^n (OEX_i + UIM_i)$, the bottom-right hand cell in Table 5.2. Using these variables, Table A5.3 gives an overview of these TBML values for a selection of 25 out of the 199 countries. The share of undervalued US exports to country *i* in the total of undervalued US exports is:

$$uex_i = \frac{UEX_i}{\sum_{j=1}^n UEX_j} = \frac{UEX_i}{UEX_t}$$

(A3.1)

and likewise for the other variables (see Table A5.4). So, Canada holds a share of 11.0/111.6 = 9.9 percent in undervalued US exports (Column 7), using the first and bottom rows of Column 1 in Table A5.3. Columns 13 and 14 present the countries' shares in US exports (*ex*) and US imports (*im*). They show that Canada is the most important export and import partner of the US, followed by Mexico with respect to exports and by China with respect to imports. For our purposes, the most interesting variables are the countries' shares of under- and overvalued US ex- and imports in the US totals relative to the countries' licit trade shares of ex- and imports in the US totals. For example, $uexr_i$, or the countries' shares of undervalued US exports in the US total relative to the countries' licit trade shares of exports in the US total export, is defined as:

$$uexr_i = \left(UEX_i \middle/ \sum_{j=1}^n UEX_j \right) \middle/ \left(EX_i \middle/ \sum_{j=1}^n EX_j \right) = uex_i / ex_i$$

(A3.2)

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[113] Absolute amounts are expressed in capitals, percentages are in lower cases, and ratios are also in lower cases but ending with letter *r*. US export to country *i* is denoted by EX_i and US imports from country *i* by IM_i. Exports can be overvalued (denoted by OEX_i) or undervalued (UEX_i) and the same applies to imports (OIM_i and UIM_i), where the over- or undervaluation is measured as the difference in value evaluated against the normal price and the actual price.

If a country's share of undervalued US exports would exactly be equal to its US export share, then the ratio $uexr_i$ is unity. If it is higher (lower) than proportional, the ratio is higher (lower) than 1. The results of these calculations are given in Table A5.5 in Appendix 5.1. Denmark has high ratios for undervalued exports and overvalued imports, both contributing to US TBML outflow. Barbados has a very high ratio (19.6) of undervalued imports. However, as Column 4 in Table A5.3 shows, the underlying undervalued US imports from Barbados amount to only US$14 million.

A5.3. Testing the Gravity Model for Trade

This appendix investigates to what extent it is possible to actually estimate a gravity model on the basis of just data flows from one country (the US in our case). Table A5.6 tests whether the log-linear gravity model for trade, as formulated in Equation (5.1), yields results similar to the ones in the literature if we restrict our trade dataset to the same asymmetric geographical structure as our TBML dataset.

Table A5.6. A traditional gravity model for US exports extended by attractiveness indicators (2004)

	Basic trade model	
		standard deviation
GDP	0.98***	0.21
Population	-0.19	0.19
Border dummy	2.03*	1.21
Common language	0.66*	0.39
Colonial background	0.86**	0.41
Distance	-0.92***	0.22
Constant	7.88***	3.02
Nr. of observations	199	
R^2, adjusted	0.64	

Note: *, ** and *** indicates significance at, respectively, the 10%, 5% and 1% level.

The results in Table A5.6 show that our results are in line with other research, such as Helpman *et al.* (2008).All coefficients have the expected sign and those of *GDP*, *Colonial background* and *Distance* are highly significant. The value on the distance coefficient is at -0.92 fully in line with the commonly found estimate of around -0.9. This indicates that the traditional gravity model applies satisfactorily to the restricted, asymmetric dataset. This result leads us to conclude that despite the fact that we use data on flows from the US only, coefficients on the most important variables of the gravity model, GDP and distance, are in line with other studies.

A7.1. Sources of Table 7.1

Denmark	
Level of knowledge	Unofficial translation of Act no. 442 of 11 May 2007 (Danish AML/CTF Act), Section 7(1); FATF (2006), Third Round Mutual Evaluation Report on the Kingdom of Denmark, p. 115. The Danish FIU has issued a list with subjective indicators for possible money laundering: The Danish Money Laundering Secretariat (2008), Indicators of Possible Money Laundering or Financing of Terrorism.
Attempt	FATF (2006), Third Round Mutual Evaluation Report on the Kingdom of Denmark, p. 120.
Data collection	Answer provided to ECOLEF during Regional Workshop, case study 1.
Germany	
Level of knowledge	Section 11(1) Geldwäschegesetz – GwG (German AML/CTF Act): "bei Feststellung von Tatsachen, die darauf schließen lassen". However, German authorities dispute this high reporting threshold. According to the FATF assessors, "German authorities (...) indicate that the notion of mere suspicion has underlain the STR system in Germany for many years, and that this interpretation is supported by the explanatory memorandum to the AML Act, which states that Section 11 is to be interpreted in line with the text of Article 22(1)(a) of the Third EC Money Laundering Directive, which requires Member States to impose a reporting requirement when an institution —knows, suspects or has reasonable grounds to suspect that ML or TF is being or has been committed or attempted". See FATF (2010), Third Round Mutual Evaluation Report on Germany, p. 165.
Transaction definition	Section (1)(4) German AML/CTF Act: "jede Handlung, die eine Geldbewegung oder eine sonstige Vermögensverschiebung bezweckt oder bewirkt"
Attempt included	See the explanation for the level of knowledge above.
Hungary	
Level of knowledge	The Unofficial translation of the Hungarian AML/CTF Act speaks in Section 23 about "any information, fact or circumstance that may suggest money laundering or terrorist financing".
Reporting threshold	MONEYVAL (2010), Report on Fourth Assessment Visit: Hungary, p. 98.
Transaction definition	Indicated by several stakeholder during interviews held in the course of the ECOLEF project.
Attempt included	It is not stipulated as such in the law, but authorities have indicated that in practice they receive such reports. However, authorities could not provide statistics on the matter. See: MONEYVAL (2010), Report on Fourth Assessment Visit: Hungary, p. 98.
Latvia	
UTR reporting threshold	Cabinet of Ministers Regulation No. 1071 On the List of Indicators of Unusual Transactions and the Procedure according to which Reports on Unusual and Suspicious Transactions shall be made, approved by the Cabinet of Ministers on December 22, 2008. For example: winning of 5.000 LATs in a casino or lottery; payment in cash for the securities in the amount of 10.000 LATs and more and for real estate dealers and car dealers the threshold is 20.000 LATs.
UTR data collection	Information provided in interviews in the course of the ECOLEF project. One can also infer this from the statistics provided in: MONEYVAL (2009), Second Progress Report of Latvia, p. 68-72.
STR attempt	MONEYVAL (2007), Third Round Detailed Assessment Report on Latvia, p. 101.

	included
STR data collection	Information provided in interviews in the course of the ECOLEF project. One can also infer this from the statistics provided in: MONEYVAL (2009), Second Progress Report of Latvia, p. 68-72.
The Netherlands	
Reporting threshold	Annex to Implementing Decree of the Dutch AML/CTF Act (Uitvoeringsbesluit Wet ter voorkoming van witwassen en financieren van terrorisme, Stb. 2008, 305.)
Transaction definition	Section 1(m) Dutch AML/CTF Act (Wet ter voorkoming van witwassen en financieren van terrorisme)
Attempt included	The Dutch AML/CTF Act speaksabout the obligation to notify an effected or intended unusual transaction (Section 16(1) AML/CTF Act:" Een instelling meldt een verrichte of voorgenomen ongebruikelijke transactie binnen veertien dagen nadat het ongebruikelijke karakter van de transactie bekend is geworden, aan het meldpunt").
Poland	
STR/SAR level of knowledge	It is not entirely clear whether it is suspicion or reasonable grounds to suspect now that the unofficial translation of the Polish AML/CTF Act (USTAWA z dnia 16 listopada 2000) speaks about ""the circumstances of which may suggest that it was related to money laundering or terrorist financing" (Section 8(3) Polish AML/CTF Act).
Definition of a transaction	Section 2(2) Unofficial translation of the Polish AML/CTF Act: transactions, it shall mean performing – on someone's own or on someone else's behalf, on someone's own or someone else's account: a) deposits and withdrawals in cash or non-cash, including transfers of funds within the meaning of Article 2 point 7 of the Regulation No. 1781/2006, commissioned both in the territory of the Republic of Poland, and beyond it, b)buying and selling foreign currency, c) transfer of the ownership or asset values, including putting such values into consignment or as collateral, and transfer of asset values between bank accounts belonging to the same client, d) a claim for shares a claim for stock swap.
STR/SAR attempt included	MONEYVAL (2007), Third Round Detailed Assessment on Poland, p. 87.
STR data collection	Information provided in interviews in the course of the ECOLEF project.
SAR data collection	General Inspektor of Financial Information on implementation of the Act of 16 November 2000 on counteracting money laundering and terrorism financing in 2009 (FIU (2009) Annual Report, at §1.1) states "A characteristic feature of SAR is that individual reports contain description of several, dozen and so and even several hundred transactions". 1 FIU (2009), Annual Report, at § 1.2.
(C)TR data collection	FIU (2009), Annual Report, at § 1.2.
Slovenia	
STR level of knowledge	Section 49 of the Unofficial translation of the Slovenian AML/CTF Act (Zakon o preprečevanju pranja denarja in financiranja terorizma (ZPPDFT), Ur.l. RS, št. 60/2007).
Transaction definition	Section 3(19) of the Slovenian AML/CTF Act (Unofficial translation).

STR attempt included	MONEYVAL (2010), Report on Fourth Assessment Visit on Slovenia, p. 84.
STR data collection	Answer provided to ECOLEF during Regional Workshop, case study 1.
CTR reporting threshold	Section 38(1) of the Slovenian AML/CTF Act (Unofficial translation).
Switzerland	
Report type	Money Laundering Reporting Office of Switzerland (2009), Annual Report, p. 3.
Level of knowledge	Section 9 of the Unofficial translation of the Swiss AML/CTF Act (Loifédéraleconcernant la luttecontre le blanchimentd'argent et le financement du terrorismedans le secteur financier du 10 octobre 1997 (Etat le 1er janvier 2010)) speaks about suspicion or reasonable grounds to suspect, but according to Swiss commentators the interpretation of this provision has been narrowed down to the extent that one must have evidence for one's suspicion. See: Chaikin, D. (2009), "How effective are suspicious transaction reporting systems?", Journal of Money Laundering Control, Vol. 12, No. 3, pp. 238-253 at 245; FATF (2005), Third Mutual Evaluation Report on Switzerland, p. 133 ("soupçon fondé").
Reporting threshold	FATF (2005), Third Mutual Evaluation Report on Switzerland, p. 133.
Attempt included	FATF (2005), Third Mutual Evaluation Report on Switzerland, p. 133.
Data collection	Although not explicitly said, researchers have deduced this from the examples provided in the Money Laundering Reporting Office of Switzerland (2009), Annual Report, chapter 3 on typologies, where examples of how a suspicion was raised are explained. In some of the examples there were several transactions involved.
United Kingdom	
Level of knowledge	The last element only applies to Section 330 Proceeds of Crimes Act (POCA). Sections 327-329 (the so-called "defence disclosures") do not contain such reference. See: Law Society (2009), Anti-Money Laundering Practice Note, at §5.3.
Attempt included	The reporting of attempted money laundering only applies to Section 330 Proceeds of Crimes Act: FATF (2007), Third Round Mutual Evaluation Report on the United Kingdom of Great Britain and Northern Ireland, p. 144
Data collection	Although it may be presumed that in the case of "defence"-SARs institutions seek consent with regard to a single transaction, it is not excluded that they concern several transactions. The Guidance Note of the Serious Organised Crime Agency on manual report and electronic SAR Online reporting states the following: "This section contains details of the transaction, or series of transactions that have aroused your suspicion (…)". The researchers have interpreted this as that one SAR in the United Kingdom may involve several transactions.

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Nederlandse Samenvatting (Dutch Summary)

Kortgezegd is witwassen het verhullen van de illegale herkomst van geld. Witwassen wordt al vele jaren bestudeerd, vooral door criminologen en juristen. Dit proefschrift probeert de vier meest prominente vraagstukken over witwassen te behandelen met behulp van multidisciplinaire economie.

Waarom is het witwassen van geld een probleem?

Als een crimineel geld moet witwassen voordat-ie het uit kan geven, krijgen opsporingsinstanties een tweede kans om de crimineel alsnog te pakken. Zelfs als de oorspronkelijke misdaad niet bewezen kan worden, kan de crimineel toch worden opgesloten voor witwassen en kan het crimineel verdiende geld worden afgepakt. Het literatuuroverzicht in hoofdstuk 3 laat zien dat er daarnaast nog 24 indirecte effecten van witwassen zijn. Zo kan witwassen nadelige effecten hebben voor de reële economie bijvoorbeeld door een verstorende werking op consumptie, spaargedrag, investeringen, inflatie, concurrentie, handel en werkgelegenheid. Verder is er bezorgdheid over de effecten van witwassen op de financiële sector, voornamelijk door een verhoogd risico voor de solvabiliteit, liquiditeit, reputatie en integriteit van de sector. Toch zou witwassen ook goed kunnen zijn voor de economie, bijvoorbeeld door extra winsten voor de financiële sector en het grotere aanbod van beschikbaar kapitaal. Momenteel is het nog onduidelijk of witwassen op de lange termijn een zegen of een vloek is voor de economie. Deze onduidelijkheid komt voort uit het feit dat de literatuur deze effecten wel weet te noemen en te beredeneren, maar dat er vrijwel geen empirische ondersteuning is voor deze effecten. Maar het is dan ook niet eenvoudig om deze effecten te berekenen, vooral omdat de belangrijkste variabele in het hele verhaal ontbreekt: de hoeveelheid witwassen. Er zijn slechts enkele schattingen beschikbaar, die zelf weer gebaseerd zijn op aannamen die moeilijk te testen zijn. Desalniettemin wordt in hoofdstuk 4 van dit proefschrift één van de effecten van witwassen geschat.

In de literatuur wordt beredeneerd dat witwassen ervoor zorgt dat misdaden de moeite waard zijn en dat criminele organisaties hierdoor legaal kapitaal verkrijgen om

hun criminele activiteiten verder uit te breiden. Om deze relatie tussen witwassen en andere criminaliteit empirisch te testen hebben we informatie nodig over de hoeveelheid criminaliteit en de hoeveelheid witwassen. Hoewel het meten van het criminaliteitsniveau in een land niet eenvoudig is, is hierover nog wel redelijk betrouwbare data te vinden. Voor witwassen is die data er helaas niet. Om het gebrek aan gegevens over de hoeveelheid witwassen te omzeilen wordt in hoofdstuk 4 aangenomen dat een strikter anti-witwasbeleid de hoeveelheid witwassen verminderd. Zo kan indirect alsnog het effect van witwassen op het algemene criminaliteitsniveau getest worden. Aangezien er op het gebied van anti-witwasbeleid ook geen grensoverschrijdend vergelijkbare data beschikbaar is, wordt er in hoofdstuk 4 zelf een index opgebouwd voor het anti-witwasbeleid in 17 landen door het evalueren van 40 verschillende beleidsaspecten. Op basis van deze data wordt met econometrisch onderzoek getest of een strikter anti-witwasbeleid inderdaad gerelateerd kan worden aan een lager criminaliteitsniveau. Deze schattingen laten zien dat vooral internationale samenwerking op het gebied van anti-witwasbeleid over het algemeen gerelateerd is met een significant lager criminaliteitsniveau. Dit empirische resultaat onderschrijft het idee dat we misdaad minder aantrekkelijk kunnen maken door witwassen tegen te gaan.

Hoe wordt geld wit gewassen?

Er zijn meerdere manieren om geld wit te wassen. Een vrij eenvoudige methode is het toevoegen van contant geld aan de kassaopbrengst van een bedrijf waar toch al veel contant geld in omgaat, zoals een bar, een restaurant, of – om het voorbeeld te noemen waar witwassen zijn naam aan te danken heeft – een wasserette. Een andere vrij eenvoudige methode is om te doen alsof je het geld hebt gewonnen. Zo kan je veel fiches kopen in het casino en deze later inleveren alsof je ze gewonnen hebt. Deze methoden hebben onder andere het nadeel dat het ze alleen aantrekkelijk zijn voor het witwassen van relatief kleine bedragen. De traditionele methode om grotere hoeveelheden geld wit te wassen is door middel van de financiële sector. Hierbij is het idee dat allereerst het geld in de financiële sector gebracht moet worden, al is dat vaak niet ineens nodig bij misdaden zoals fraude en internetcriminaliteit. Vervolgens wordt het geld veelvuldig de wereld rond gepompt met een ingewikkeld web van overschrijvingen, onderhandse

leningen, valse betalingen, trustkantoren en offshore vennootschappen totdat de herkomst van het geld totaal onduidelijk is geworden. Het meeste anti-witwasbeleid lijkt vooral deze vorm van witwassen te bestrijden. Een relatief recent ontdekte witwasmethode, die op dit moment aan minder anti-witwasbeleid onderhevig is, is op handel gebaseerd witwassen. Bij deze vorm van witwassen worden de prijzen voor import- en exportproducten bewust onder- of overgewaardeerd om zo schijnbaar legale winsten te kunnen boeken. Hoofdstuk 5 van dit proefschrift bestudeert dit op handel gebaseerde witwassen.

Hoofdstuk 5 laat zien dat de op handel gebaseerde witwasstromen te verklaren zijn in de vorm van een graviteitsmodel. Isaac Newton ontdekte dat zwaartekracht afhangt van de massa van de twee objecten die elkaar aantrekken, en de afstand tussen deze objecten. Zo zijn ook op handel gebaseerde witwasstromen tussen landen te verklaren met de massa van beide landen (gemeten in BBP) en de afstand tussen deze landen. Verder suggereren onze schattingen dat witwassers die geld willen sturen naar landen met een streng anti-witwasbeleid, op handel gebaseerd witwassen gebruiken als alternatief voor de traditionele manier van witwassen. Anti-witwasbeleid met een meer gelijkmatige aanpak van de verschillende vormen van witwassen zou dan ook wenselijk zijn.

Waar komt al dat wit gewassen geld uiteindelijk terecht?

Er zijn schattingen dat de omvang van witwassen ongeveer 2 tot 5% van het BBP zou kunnen zijn. Het is moeilijk voor te stellen hoe zulke enorme geldstromen vrijwel ongemerkt weer in de legale economie terecht komen. Het is dan ook de vraag waar in de economie dit geld weer opduikt. Hoofdstuk 6 analyseert één van de prominente sectoren waar veel van dit geld terecht zou kunnen komen: de vastgoedsector. De vastgoedsector wordt genoemd als een mogelijke bestemming van witwasgeld, omdat de sector qua grootte het vermogen heeft om dit geld te absorberen. Daarbij komt dat de vastgoedsector een aantal specifieke karakteristieken heeft die interessant zijn voor witwassers, zoals de heterogeniteit van de gebouwen, de ondoorzichtigheid van de markt en de mogelijkheid om het feitelijke eigendom te scheiden van het juridisch eigendom.

Toch is er nog geen systematische studie gedaan naar het belang en de frequentie van witwassen in de vastgoedsector.

Hoofdstuk 6 laat zien dat door middel van multidisciplinair onderzoek een informatie gestuurd detectiemodel ontworpen kan worden voor witwassen in de vastgoedsector. In deze studie worden verschillende databases gecombineerd om de volledige vastgoedmarkt in twee steden (Utrecht en Maastricht) te kunnen analyseren. Op basis van de literatuur zijn 17 indicatoren voor witwassen geselecteerd en deze zijn vervolgens toegepast op onze dataset van 11.895 vastgoedobjecten. Door middel van een criminologische analyse van 200 van deze vastgoedobjecten kwamen 36 aandachtpanden naar voren waarbij er vermoedens zijn van witwassen of andere daaraan gerelateerde misdrijven. Deze informatie is gebruikt voor een econometrische analyse die laat zien dat drie opvallende karakteristieken van vastgoed zijn gerelateerd aan een significant hogere kans op witwasvermoedens. De voorlopige 'magische formule' die uit ons onderzoek naar voor komt suggereert dan ook dat vastgoed met ongebruikelijke waarde sprongen 25%. meer kans heeft op witwasvermoedens en dat de aanwezigheid van pas opgerichte bedrijven en buitenlandse eigenaren gerelateerd zijn aan respectievelijk 24%. en 15%. meer kans. Het systematisch toepassen van een dergelijke magische formule op de gehele vastgoedsector zou inzicht kunnen geven in hoe vatbaar de vastgoedsector is voor witwassen.

Hoe kunnen we witwassen bestrijden?

Witwassen is vaak een grensoverschrijdende misdaad. De redenen voor deze grensoverschrijdende activiteiten moeten waarschijnlijk gezocht worden in het feit dat het een vorm van verhulling kan geven en omdat andere landen wellicht een tolerantere houding hebben ten aanzien van witwassen. Het is dan ook van belang dat anti-witwasbeleid internationaal wordt aangepakt, want als er één land in de wereld zijn verantwoordelijkheid niet neemt, zijn de inspanningen van alle andere landen tamelijk nutteloos. Op dit moment neemt de FATF – een intergouvernementele organisatie opgericht door de G-7 – de leiding in de internationale aanpak van witwassen. Het streven van de FATF is dat alle landen meedoen aan de strijd tegen witwassen. Vrijwel

alle landen in de wereld zijn momenteel lid van (een regionale versie van) de FATF. De strategie van de FATF is gebaseerd op 2 pijlers: het zetten van standaarden in anti-witwasbeleid en de evaluatie van alle landen op basis van deze standaarden. De standaarden en evaluaties van de FATF zijn niet gebaseerd op harde wetgeving maar op aanbevelingen. Echter, door het gebruik van zachte wetgevingsinstrumenten, zoals het op een zwarte lijst zetten van landen met onvoldoende anti-witwasbeleid, hebben vrijwel alle landen in de wereld zich min of meer vrijwillig laten evalueren en proberen zij te voldoen aan deze internationale standaarden. In het begin waren deze evaluaties vooral gericht op controleren van de aanwezigheid van de voorgeschreven wetten en relevante instanties. Recentelijk komt de focus steeds meer te liggen op de feitelijke uitvoering en effectiviteit van deze wetten. Het meten van dit soort juridische effectiviteit is niet gemakkelijk. Zo moet in elk land de financiële sector (en andere meldingsplichtigen zoals notarissen, advocaten, juweliers en autohandelaren) melden als zij te maken krijgen met ongebruikelijke transacties die kunnen duiden op witwassen. Op dit moment worden op basis van statistieken, zoals het aantal meldingen van ongebruikelijke transacties, conclusies getrokken over het anti-witwasbeleid.

Hoofdstuk 7 laat zien dat de huidige vorm van evalueren van de FATF lijkt op een principaal-agent probleem met strategisch handelen, waarbij de principaal (de FATF) het feitelijke gedrag van de agenten (de landen) niet kent en dit vervolgens indirect probeert te meten. Het idee van de FATF lijkt te zijn dat, als het aantal meldingen in een bepaald land te laag is, het anti-witwasbeleid niet goed functioneert. Wij laten zien dat de FATF het aantal ongebruikelijke transacties in verschillende landen vergelijkt terwijl er op dit moment geen solide basis is voor een dergelijke vergelijking, omdat deze meldingen internationaal op veel aspecten verschillen. Zo kan een witwasconstructie die in het ene land leidt tot een enkele melding, in een ander land leiden tot tientallen meldingen. Met behulp van strategisch gedrag zouden landen ervoor kunnen zorgen dat de papieren werkelijk die gecontroleerd wordt, een veel mooier beeld geeft. Wij concluderen dat de FATF nu een drietal beleidsopties heeft om deze mogelijkheid tot strategisch gedrag in te perken. Allereerst zou de FATF kunnen streven naar een uniforme definitie van een melding, maar dit lijkt door de huidige institutionele setting een langdurige en ingewikkelde opgave te worden. Als alternatief zou de FATF in ieder geval beter af zijn als

zij zich niet meer baseren op het aantal meldingen, maar op het aantal hieraan gerelateerde personen en euro's, zodat het verschil in definities van een melding de vergelijkingen in ieder geval niet meer verstoren. Toch zijn wij uiteindelijk van mening dat de FATF beter een compleet nieuwe weg kan inslaan. Wij stellen voor om gebruik te maken van – zoals wij dat noemen – *mystery shopping*. Het idee hierbij is dat er witwastransacties worden uitgevoerd in elk land en dat er dan gekeken kan worden of deze witwastransacties ontdekt worden door de autoriteiten.

Curriculum Vitae

Joras Ferwerda (March 5, 1984) holds a Bachelor in Economics and Law and a Master in Economics and Social Science from the Utrecht University School of Economics in the Netherlands. He is currently studying for a PhD in economics at the Utrecht University School of Economics in the Netherlands on the topic 'the Multidisciplinary Economics of Money Laundering'.

He did the first study on the amounts and effects of money laundering in the Netherlands for the Dutch Ministry of Finance and a study on money laundering in the real estate sector for the Dutch Ministry of Finance, Justice and Interior Affairs. He organized the conference 'Tackling Money Laundering' with international leading experts on money laundering in Utrecht, the Netherlands. At the moment he has an EU financed project on the effectiveness of anti-money laundering and countering terrorist financing policies in the 27 EU member states. Among his scientific publications he has an article published in Review of Law and Economics entitled 'The Economics of Crime and Money Laundering: Does Anti-Money Laundering Policy Reduce Crime?', an article accepted for publication in the journal Applied Economics entitled 'Gravity Models of Trade-Based Money Laundering' and a book published by Edward Elgar entitled 'Money Laundering in the Real Estate Sector: Suspicious Properties'

Next to his research, he was involved in teaching at both the bachelor's and master's levels at the Utrecht University School of Economics and the Utrecht University School of Governance. Furthermore, he did some referee work and gave presentations at more than a dozen conferences in more than half a dozen countries.

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