

ILLCIT FINANCIAL OUTFLOWS THROUGH
TRADE MISINVOICING IN DEVELOPING COUNTRIES:
THE INFLUENCE OF MARKET CONCENTRATION

by

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by

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This master's thesis examines the effect of market concentration on illicit financial outflows in developing countries. It argues that firms are more willing to shift funds illicitly abroad using the channel of trade misinvoicing when the market structure allows them to maintain cozy relationships with government officials. To test this hypothesis, I employ panel data from the Global Financial Integrity, the World Bank, Transparency International, the PRS Group and the KOF Konjunkturforschungsstelle covering 60 countries and the period 2005-2014. The regression results reveal that higher market concentration, higher resource dependence, more development aid and higher external debt stocks significantly increase illicit financial outflows due to misinvoicing in merchandise trade. The analysis does not find significant results for political stability and corruption control. This thesis recommends that governments in developing countries must combat the increasing market dominance of key players in international trade.

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CHAPTER 1

INTRODUCTION

1.1 Puzzle

Guinea and Togo are two developing countries with access to the Atlantic Ocean. They are both members of the Economic Community of West African States. They both evolved from former French colonies and they both declared their independence within the same time period (1958-1960). As is the case with many African countries, newly institutionalized governments in Guinea and Togo were of an autocratic nature. However, as democratization processes have been partially successful in the 1990s, the Polity IV Index currently classifies these unitary presidential republics as “anocracies”. Like many of their neighbors, Guinea and Togo are both haunted by epidemic poverty across their populations. Despite being rich in natural resources, Guinea, with a GNI per capita of USD 2,180, was listed as the 23rd poorest country in the world in 2017 (*USA today*¹). The same list ranks Togo 11th, with a GNI per capita of USD 1,620. At the same time, total rents from natural resources made up 22% of the GDP in Guinea in 2016, and 20% in Togo².

Over the last two decades, capital flight has grown to unknown amounts in Africa (Ndikumana et al., 2015). The Africa Growth Initiative (AGI) reports that Togo has lost illicit outflows equivalent to 94 percent of its total trade over the period 2005 to 2014, mainly through trade misinvoicing (AGI, 2018). The Washington-based non-governmental organization (NGO)

¹ Source: <https://www.usatoday.com/story/money/2018/11/29/poorest-countries-world-2018/38429473/>

² Data from World Development Indicators (WDI), 2018

Global Financial Integrity (GFI) regards illicit financial flows (IFF) as one of the biggest problems that Togo currently faces as a country (GFI, 2019). Surprisingly, a glance at the GFI data reveals that Guinea seems to suffer significantly less from IFF compared to Togo. Guinea lost IFF equivalent of 5% of its GDP in 2013 when Togo lost 36% in the same time period. This variation in IFF among seemingly comparable developing countries is the puzzle that motivates this Master thesis.

To illustrate this puzzle further, I elucidate on how the previous literature is unable to explain the variation of IFF between countries such as Togo and Guinea. First, IFF are found to be tightly linked to large-scale corruption in developing countries (Reed and Fontana, 2011). However, the countries are perceived to have similar corruption levels—they both score poorly on the Transparency International’s Corruption Perception Index in 2018 (Togo: 32, Guinea: 30). Hence, this explanation is unsuited to solve the research puzzle. Furthermore, Boyce and Ndikumana (2003) find a positive relationship between inflation as well as foreign debt and capital flight. While the relationship between capital flight and IFF shall be discussed later, it is crucial to point out that Guinea experienced hyperinflation in 2006 whereas Togo did not. Furthermore, according to the World Bank’s World Development Indicators (WDI), their external debt stock is characterized by a similar historical trend. The most recent data shows that, in 2016, Guinea had an external debt stock of 16% while Togo had an external debt stock of 26%. In summary, it is puzzling as to why Togo loses more money through international trade in comparison to that of Guinea.

1.2 Research Question

Generalizing the puzzle identified above, this Master thesis looks at the variation of IFF among all developing countries. As will be discussed below, I thereby focus on the illicit practice of trade misinvoicing, which appears to account for the bulk of total IFF estimates (GFI, 2019). In sum, this thesis aims to approach the following research question: Why do some developing countries suffer from high illicit financial outflows through trade misinvoicing while others do not?

1.3 Importance

The question of varying IFFs is not merely of academic nature but has real world implications as illicit outflows can have numerous adverse effects on the economy. Most importantly, IFF represent lost potentials for economic growth for developing countries (Nkurunziza, 2012, p.17). Every dollar that leaves a country illegally will be invested or consumed elsewhere. Thus, IFF has a negative impact on private investment, which eventually hampers domestic growth (Nkurunziza, 2012, p.17). As such, economic distortions and forgone investments are primary reasons to intensify research on this matter.

On a different level, IFF relate to tax revenue leakages, which hurt government investments and government sponsored programs. Primarily, IFF denote lost investment potentials for poverty-reducing programs that could improve the health, education or job market of the extreme poor (Le Billon, 2011, p.9).

A third concern about IFF is that they might foster corruptive practices in industries and governments (Nkurunziza, 2012, p.15). Le Billon (2011, p.10) also argues that IFF might

discourage accountability, support short-term thinking, and encourage corruption amongst bureaucrats and officials. Reuter (2012) argues that IFF cause erosion in accountability and tax morale among citizen and the state. Additionally, it would cement growing inequality within and between countries (Everest-Phillips, 2012, p.88).

In consideration of these adverse side effects, politicians must work to enhance their understanding of illicit outflows in order to tackle them at their roots and subsequently minimize their outbreak in the future. This will better serve the governments in developing countries in their struggle for sustained development. As a means to push this agenda forward, the government of Norway started the Task Force on the Development Impact of Illicit Financial Flows in 2008. This organization fights IFF under the assumption that it undermines development and government legitimacy, as well as increase debt, aid dependence, and the risk of future economic crises. However, there was a lack of empirical studies, at the time, due to the relative novelty and uncertainty of data on IFF (Le Billion, 2011, p.9)

Specifically, the comparison of illicit outflows with development aid makes future research for IFF appealing. Kar and Cartwright-Smith (2008) estimate that up to 1.06 trillion left developing countries through illicit channels until 2006. Putting this figure in relation, official aid from the 22 countries of the OECD Development Assistance Committee provided 103.9 billion US dollars in aid in 2006 (Fontana, 2010, p.1). While billions of US dollars have entered developing countries within the last decades, IFF is potentially responsible for huge outflows of the same money—or money that would have made development aid redundant in the first place. Considering the staggering efforts that scholars and international organizations have taken to

study the topic of development aid, the call for a closer examination of the causes of IFF appears to be more than reasonable.

CHAPTER 2

LITERATURE REVIEW

1.1 Defining Illicit Financial Flows

Before entering the discussion of potential sources for IFF, it is ineluctable to discuss which flows this term actually aims to describe first. Unfortunately, IFF is an “ill-defined term”, and scholars disagree about its particular elements (Reuters, 2012, p.7). To give a small overview of this discussion, I present the three most common definitions of IFF:

Table 1: Definitions of IFF

Author	Definition of IFF
Global Financial Integrity (2019)	“Money that is illegally earned, transferred, or utilized. Somewhere at its origin, movement, or use, the money broke laws and hence it is considered illicit.”
United Nations Development Program (2011)	IFF “include, but are not limited to, cross-border transfers of the proceeds of tax evasion, corruption, trade in contraband goods, and criminal activities such as drug trafficking and counterfeiting.”
Blankenburg and Khan (2012)	IFF are “flows that imply economic damage for a society given its existing economic and political structure.”

Potentially, all these definitions include practices such as tax evasion, smuggling, organized crime, the manipulation of transfer or trade prices, customs fraud or bribery (Blankenburg and Khan, 2012, p.33). The common underlying idea of these definitions is to identify the flows that cause economic damage for a society as well as the ones that end up solely benefiting the elite rather than the broad population (Le Billion, 2011, p.2). Thereby, the notion illicit does not mean

illegal. Illicit flows may be legal, but if the legal framework does not reflect the interests of the general society, illicit flows can comprise de jure legal outflows (Blankenburg and Khan, 2012, p.21). In other words, outflows that damage development may sometimes not correspond to law violations. This circumstance justifies the usage of the term *illicit* instead of *illegal*.

The literature on capital flight is significantly older than the literature of IFF. It started to deal with the problem of abnormal outflows from developing countries in the 1980s, i.e. in the aftermath of the Latin American debt crisis (Blankenburg and Khan, 2012, p.27). Boyce and Ndikumana (2001, p.6) define capital flight as the discrepancy between capital inflows and foreign exchange outflows. Capital inflows comprise net foreign direct investment (FDI) incl. foreign investments in domestic stock markets and net external borrowing. Foreign-exchange outflows consist of net additions to foreign reserves and the current account deficit (Boyce and Ndikumana, 2001, p.6). Traditionally, capital flight is explained by the portfolio choice theory. More specifically, Dooley (1988) elaborates that capital flight is a response of utility maximizing rational economic agents in the face of relatively higher foreign returns compared to domestic returns on assets. However, Boyce and Ndikumana (2003) show that capital flight cannot be explained by considerations of portfolio diversification, but instead is driven by motives of tax avoidance, evasion of legal prosecution of illegal origins of wealth, and other illicit motives. The focus of researchers has ever since narrowed down to that subset of capital flight which is regarded to be illicit. Figure 1 illustrates the relationship between capital flight and IFF:

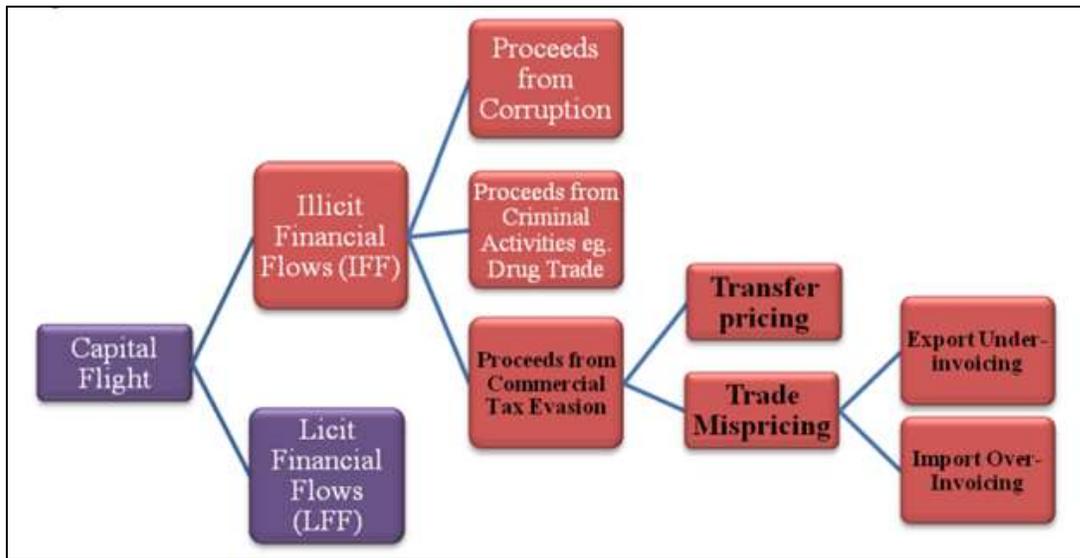


Figure 1: Capital flight and IFF Channels. Source: Mevel, ‘Ofa and Karingi (2013)

In practice however, when it comes to data aggregation, measures of IFF use the same conventional measures of capital flight and integrate them with estimates of trade misinvoicing (Kar and Cartwright-Smith, 2008, p.21). In fact, due to the similarity of the concepts, capital flight and IFF are often used interchangeably in the literature (compare Mevel et al., 2013). A discussion of the exact estimation methods used in the context of IFF will be presented in the discussion of the dependent variable for the statistical analysis.

According to the broadly used classification by Baker (2005), the umbrella term “Illicit financial flows” contains three distinct elements:

- (1) Commercial tax evasion
- (2) The laundering of proceeds from crime and corruption
- (3) The theft of state assets

Based on this classification, Cobham (2014) identifies four types of IFF by nature of capital and transition (see figure 2). He furthermore sorts out three groups of major actors in IFF:

- (1) Private actors such as individuals, domestic businesses and multinational company groups committing tax and regulatory abuse
- (2) Public officeholders being involved in abuse of power through corruption and bribery
- (3) Criminal groups that engage in laundering the proceeds of crime, and those using crime to enhance their social and political agenda.

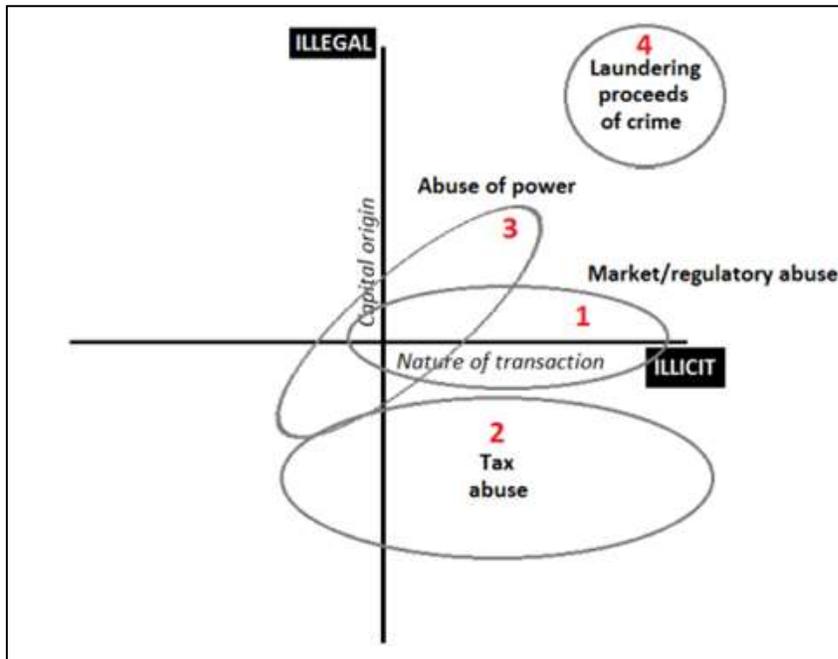


Figure 2: Main IFF types by nature of capital and transaction. Source: Cobham (2014)

As mentioned above, the underlying idea of IFF is to identify outflows that potentially damage economic development (Blankenburg and Khan, 2012). The four presented types differ in various aspects such as actors, motives, causal mechanisms, and consequences for the economy.

However, Baker (2005) finds that commercial tax evasion makes up approximately two thirds of the total IFF. I argue that instead of using a composite concept such as IFF, which comprises distinctively different activities, it is more promising for research to focus on a certain type of IFF - identified by actors involved as well as their respective practices and motives. The disentanglement of the umbrella term will enable researchers to make more clear-cut predictions about the effect of different variables on specific aspects of IFF.

Having identified that commercial tax evasion represents the bulk of IFF, I have chosen illicit financial flows through trade misinvoicing (TMO) as the main variable in question, for which the respective variation is aimed to be explained by the hypotheses presented in the theory section.

2.2 Explanations for the variation of IFF across countries

After having discussed the puzzle and the definitions of IFF, the following section will present the most convincing theories of the current literature that aim to explain its variation across countries.

The conventional neoclassical theory predicts that capital should move from capital-abundant countries to capital-scarce countries as the returns in the latter should be relatively higher (Almounsor, 2006, p.2). Hence, the fact that developing countries experience large amounts of capital outflows since the 1980s contradicts these predictions and thus presents a puzzle in itself. As previously stated, the capital flight literature largely focused on the outflows of capital from developing economies long before the IFF literature emerged. Therefore, the theoretical concepts of capital flight serve as a starting point to identify core drivers of corporate

outflows that might harm the domestic economy (Reuters, 2012, p.8). The capital flight literature identifies at least three core drivers of capital flight that are proposed by different streams of the literature: The portfolio approach, the social control approach, and the dirty money approach (Blankenburg and Khan, 2012).

The Neoclassical *portfolio choice theory* builds the foundation for various hypotheses. Its basic premise is that portfolio decisions are made by rational economic agents. The high-risk environments of developing countries influence these agents' utility maximizing strategy in such a way that they transfer assets to richer countries with more advantageous investment opportunities (Dooley 1988). As such, differences between expected average post-tax returns on assets in foreign markets compared to the domestic market drive capital flight (Dooley 1988). Many factors influence domestic average post-tax returns and especially the high-risk environment in developing countries. Scholars have argued that possibly all macroeconomic policy distortions that influence investment risks can be seen as causes for capital flight (Blankenburg and Khan, 2012). This might include regime types, probabilities for expropriation, civil unrest, war, economic crises, and many more. In sum, this line of theory suggests that developing countries, particularly those which are characterized by high economic and political instability, should face higher capital outflows (Le & Rishi, 2006). In particular, unfavorable macroeconomic environments are characterized by low real interest rates, overvalued exchange rates, and rising external debt. These factors potentially serve to increase fear of inflation, rising corporate income taxes, and economic crises (Bouchet, 2012). In other words, an overvalued domestic currency causes economic agents to expect a depreciation of the currency in the future.

In doing so, these agents convert their assets into foreign claims as a means to avoid potential capital loss (Bouchet, 2012). Ndikumana and Boyce (2011) base their debt-driven capital flight thesis on this same argument as companies might fear higher future taxation of domestic governments. In fact, Ajayi (1995) shows that the overall financial solvency of a government influences capital flight, and that fiscal deficit, which creates risk of insolvency, work as an explicit determinant of illicit corporate outflows through trade. The main argument from the portfolio choice theory can be summarized as follows:

***Hypothesis 1:** In comparing developing countries, those being characterized by high economic and political instability will be more likely to have high illicit financial outflows through trade misinvoicing than more stable countries.*

Taking the economic conditions in developing countries as given, Khan and Blankenburg (2012) argue that policy makers' interference with competitive markets cause social damage. Profit-maximizing firms would be incentivized to escape such interference and as a result shift money abroad (Collier et al., 2001). Hence, removing government interventions in competitive markets would be the best recipe to fight capital flight (Khan and Blankenburg, 2012, p.30). This argument is also used by the IFF literature as corporations might use illicit and illegal practices to protect their proceeds against incalculable risks (Kar and Freitas, 2011). According to this so-called *social control approach*, it is not the high-risk environment but rather the greed of private economic gain that motivates corporations to engage in capital flight (Boyce and Zarsky, 1988, p. 192). The starting point of this approach is to assume that every society agreed upon a *social*

contract, which expresses rules under which individual in that society are supposed to interact with each other (compare Rawls, 1971). This social contract finds representation in rules, laws, and moral principles. As such, when individuals respect this contract this serves to enhance the welfare of the society as a whole. Furthermore, control over capital is subject to social constraints. Therefore, illicit outflows, by their damaging and illicit nature, are socially damaging purely through the violation of the social contract (Walter, 1987, p. 105). As such, lack of enforcement of social contracts is seen as the main driver of capital flight and proves to be most detrimental to the domestic economy. Scholars refer to this driver as poor governance, expressed through abuse of power, corruption, and weak regulation (Ndikumana and Boyce, 2012, p.35). Since capital flight occurs when government controls are missing, indices that measure government effectiveness, corruption control etc. are commonly used to test for the validity of this theory (Orkoh et al., 2017).

Assuming an environment that is characterized by high levels of corruption, corporations will find politicians and officials to be more responsive towards bribes. Hence, the option to buy off governments gives corporations the ability to violate international standards in international trading without a fear of repercussions (Kar and Freitas, 2011). In other words, bribing officials serves as an insurance against domestic legal enforcement that companies in less corrupt environments have to fear. Thus, a corrupt business environment that enables cozy relationships with officials can ultimately lead to high IFF. Furthermore, the political economy literature as well as the new institutional economic literature extends these arguments by viewing corruption and rent-seeking in the context of extractive political institutions as the main source of capital flight (Sachs and Warner, 1995; Acemoglu and Robinson, 2004). The best policy response to

fight capital outflows would be to reinforce social controls over private capital movements, such as intensified corruption control efforts (Abayomi, 2006). This could be done through the strengthening of existing government programs or introducing new, more effective administrative programs. The main argument from the social choice theory can be summarized as follows:

***Hypothesis 2:** In comparing developing countries, those having ineffective corruption controls will be more likely to have high illicit financial outflows through trade misinvoicing than those being able to fight corruption effectively.*

The third approach to explain capital flight is called the *dirty money approach*. The central argument is that capital flight follows the desire to accumulate wealth by hiding from the rule of law. The commercial component of dirty money considers tax evasion; this includes trade misinvoicing and abusive transfer pricing (Baker, 2005). The relevant question is: Where does simple tax avoidance end and illicit tax evasion start? Le Billion (2011) argues that tax evasion is at place when regulations are broken. Furthermore, it is called tax fraud when companies make use of falsified documents (Le Billion, 2011, p.7). The practice of trade misinvoicing is perceived, at a minimum, as tax evasion. However, trade companies can, for example, also use high-interest loans for subsidiaries in developing countries to avoid taxes (Le Billion, 2011, p.6). Through this channel, profits can be guided through subsidiaries in low-tax jurisdictions towards the company's headquarters with the result that taxes are saved in the origin country. In face of these similarly illicit practices, why would a company choose to involve itself in trade

misinvoicing? This puzzle cannot be explained by merely using the rationale of tax evasion. Instead, it might be the risky environment as suggested by the portfolio diversion theory, which incentivizes companies to use trade misinvoicing as a method. In doing so, it allows companies to strategically transfer relatively bigger bulks of money abroad than through high-interest loans.

Besides these classical capital flight arguments, the IFF literature has identified additional factors that potentially explain variation of IFF across countries. First of all, globalization might facilitate trade misinvoicing and fraudulent transfer pricing as enhanced financial globalization eases transfers of illicit capital through offshore banking (Rahman et al., 2018). In this context, a closer look at foreign markets might be worthwhile. Capital flees developing countries to developed countries due to push and pull factors respectively. Drawing from the portfolio diversion theory, Bouchet (2012) identifies external pull factors of capital flight. He lists the loose international banking regulatory framework, the comparatively strong and stable exchange rates of hard currencies in combination with high external interest rates, booming foreign stock markets and offshore tax heavens as the major pull factors of capital flight (Bouchet, 2012).

Furthermore, the new institutional economic literature proposes that pure economic underdevelopment alone might already serve as a reason for capital flight (compare North, 1987; Acemoglu et al., 2001) The reasoning follows that the lack of economic development is associated with extractive political institutions, which foster pervasive rent-seeking behaviors among corporate elites (Acemoglu and Robinson, 2004). Andersen et al. (2013) find that especially in commodity-rich countries this rent-seeking behavior leads to a marked increase in private bank holdings in well-known tax havens when combined with weak political institutions.

Everest-Philipps (2012) enhances the social cost theory by stating that the main cause of IFF is not necessarily poor capacity of administrations, but in fact simply the failure of political will. On another hand, Collier et al. (2004) argue that development aid should be positively correlated with capital flight as it potentially causes moral hazard and provides opportunities for corruption.

Lastly, a big bulk of the literature has focused on the link between illicit capital outflows and natural resources. Nkurunziza, (2012) argues that the illicit appropriation of resources in the form of theft, corruption, mismanagement of public resources, and trade mispricing is the reason for Africa's high illicit outflows. Le Billon (2011) points out that fuel exporters accounted for nearly half of the IFF from Africa between 1970 and 2008. This builds on the argument of Baker and Kodi (2010) who theorized about the correlation of illicit outflows with oil prices. More broadly, resource-rich countries tend to underperform in revenue collection as IFF derive from poor governance of extractive industries (Le Billon, 2011, p.10). This leads to underreporting of the volume and quality of processed resources, especially when technical expertise and equipment is required for the measurement (p.5).

2.3 Findings of the empirical literature

Claessens and Naude (1993) forecast Bakers' (2005) later findings that trade misinvoicing is an integral component of capital flight and thus endorse the appropriateness of focusing on trade misinvoicing in this thesis. Mpenya et al. (2016) and Kwaramba et al. (2016) come to similar conclusions as they identify trade misinvoicing to be an important channel of capital flight, especially in countries that have a sizable natural resource sector.

The number of large-n statistical analyses on IFF for developing country is very limited (Orkoh et al., 2017). However, more empirical exercises concentrating on developing countries can be found in the capital flight literature. As suggested by theoretical considerations, at early ages, scholars searched for evidence for the portfolio choice theory in the context of capital flight. Almounsor (2006) examines the role of capital flight in oil states and finds that macroeconomic and political conditions are in fact core drivers. He applies market size, GDP growth and current account balance as macroeconomic variables. Furthermore, Kant (1998) tests whether foreign direct investment (FDI) influences the size of capital flight in several developing countries as more incoming money might increase the availability of money that is potentially embezzled. However, Kant (1998) finds that FDI is negatively correlated with capital flight. Using data from 39 countries in Sub-Saharan Africa between 1970 and 2010, Ndikumana et al. (2015) offer a detailed summary of potential measurements and drivers of capital flight. They find a positive correlation of capital flight with external borrowing. In the same vein, Murinde et al. (2015) find that past capital flight causes future capital flight. Furthermore, their result suggests that strong economic growth negatively affects capital flight.

Prior, Ndikumana and Boyce (2011) test in another empirical study the effect of interest rate differentials on capital flight in Africa. Their non-significant results question the empirical validity of the conventional portfolio choice theory. Furthermore, Ndikumana and Boyce (2012) advance their argument of policy-driven capital flight by showing empirically that regime types and governance explain variation in capital flight among Sub Saharan African countries. In yet another empirical exercise, Ndikumana et al. (2015) fail to find any robust evidence for the correlation of inflation, political regime, capital account openness, or financial development in

respect to capital flight. Instead, they reinforce the importance of institutional quality, especially for countries that are rich in natural resources (Ndikumana et al., 2015).

Furthermore, Williams (2010) finds that high natural-resource dependence reduces the level of transparency and increases corruption in general. More specifically, Ndikumana and Boyce (2011) find statistical support for the link between oil exports and illicit capital flight.

Turning explicitly to the empirical literature of IFF, I could only identify two empirical studies that aim to explain variation in IFF across countries using GFI estimates as the dependent variable. Orkoh et al. (2017) employ a fixed effects regression model to examine the effect of political stability and corruption control on illicit financial outflows in Sub-Saharan Africa. Using GFI data on IFF from 2005-2014, they find that political stability and corruption control both serve to reduce outflows due to misinvoicing. Furthermore, their results indicate that exchange rates have a negative influence on illicit financial outflows. In contrast, FDI increases illicit financial outflows in their empirical model. Secondly, Rahman et al. (2018) empirically explore the variation of illicit financial outflows using a dataset of sixty developing countries. As explanatory variables, they include indices for corruption perception, political stability, macroeconomic vulnerability and overall globalization as well as a measure for gross domestic savings. Using GFI data on IFF from 2003-2014, they invoke Pedroni's heterogeneous panel data analyses for co-integration. Their findings only identified political stability as a means to reduce illicit financial outflows significantly.

CHAPTER 3

THE FACTOR OF MARKET CONCENTRATION

In this chapter, I develop the argument that higher firm concentration in the domestic market enables rent-generating firms to maintain cozy relationships with government officials, which results in less rigorous control practices. This, in turn, gives those firms more leeway to engage in illicit practices such as trade misinvoicing. Building on the presented portfolio choice theory, I argue that exporting firms are more willing to shift funds out of the country through trade misinvoicing when they fear little legal and political consequences from doing so. By comparing expected returns in domestic and foreign markets, rational economic agents also consider the costs of the cross-border transfer that is necessary to shift funds abroad. If the transfer costs are relatively high, returns from foreign markets become relatively less attractive and companies rather leave their assets in the domestic market. Multiple factors play a role in estimating transfer costs, such as the infrastructure of financial markets or the expected costs associated with potential penalty payments for illegal activities. Focusing on the latter, in environments where firms can maintain personal relationships to government officials, these expected costs of penalties decrease, which makes illicit transfers relatively more favorable.

This argument goes beyond the simple corruption argument proposed by the existing literature as it acknowledges the market structure in which firms operate as well as the consequences that these structures have on IFF. Governments, which depend heavily on the tax income and economic performance of a few big rent-generating companies, act in their own interest when they offer some operational latitude to these firms, i.e. through lax scrutiny regarding trade misinvoicing. Government dependence emerges when only a few companies in

the economy provide the majority of taxes and from which economic performance the income of a significant part of the electorate is affected. Thus, market concentration can gauge the degree of which firms engage in illicit practices.

Market concentration refers to the general density of influential firms in the economy. The causal mechanism does not necessarily depend on the firm concentration of a specific industry such as the banking or the trade sector. Instead, trade firms can exploit the lax regulatory environment, which results from the general dependence of governments on a limited number of economic players. In addition, developing countries are per definition characterized by a relative lack of capital and a relative large natural resource sector. Hence, it is reasonable to assume that trade firms, which export resources and thus potentially engage in misinvoicing practices, are among the biggest in their home countries. As a result, the overall market concentration of an economy illustrates a good picture of the degree of tightness between trade firm decision makers and government representatives.

Shorty summarized, the argument leads to the prediction of high IFF through a causal mechanism as follows: Big private sector firms in developing countries have incentives to lobby politicians to relax controls on their operational practices as this gives them more freedom in profit-generating activities and profit-shifting practices. A high market concentration limits the number of relevant players that will more easily overcome collective action problems associated with lobbying (Mukherjee et al., 2014). At the same time, a higher market concentration of firms makes politicians more responsive towards these demands as the economic performance of a country is highly dependent on the performance of these concentrated firms. Finally, large firms

that engage in international trade will exploit this granted latitude by shifting funds abroad through trade misinvoicing for the reason of tax avoidance.

This proposed argument leans on theoretical thoughts of Mukherjee et al. (2014), who elaborate how higher concentration of domestic private-sector banks lead to higher levels of capital account openness in developing states. Based on the literature of different regime types, I expand this argument by assuming that autocratic institutions make politicians more responsive to these interest-group demands. Leaders in autocracies have more political incentives to cater to the demands of interest groups than democracies, who also have to consider the demands of the general electorate. In other words, the simple argument that autocratic governments face less electoral pressure is applied (Bearce and Hallenberg, 2011). Autocratic governments should thus be more likely to respond to the lobbying efforts of these market-dominating firms and exert less scrutiny in audit and legal enforcement procedures.

The basic idea of the proposed causal mechanism finds reflection in various forms in the existing literature. The literature of corporate governance, for example, supports the link between concentrated managerial power and government responsiveness. More specifically, Cioffi and Höpner (2006) point out that all types of governments, when facing potential crises, tend to bow to concentrated managerial power instead of the demands of the electoral base. Furthermore, the proposed argument is supported by the work of Weiss and Wichowsky (2018), who pose that trade sector firms have the tendency to be more concentrated and larger; this enables them to overcome collection action problems.

Additionally, Zhu (2017) finds that rents enjoyed by firms are typically high when markets are concentrated and competition is low; this supports the idea that governments are

increasingly income-dependent on big firms when the market concentration is high. Furthermore, Zhu (2017) presents evidence that foreign presence is associated with increased levels of bribes, inter alia, through higher market concentration. This finding is especially relevant for developing countries that depend on proceeds from the natural resource sector, which are primarily extracted from firms based in developed countries. Lastly, Mukherjee et al. (2014) support the link between high market concentration and the implementation of the demands of these firms by stating that higher concentration of rent-generating firms will have the ability to politically outmaneuver other unorganized groups, such as smaller firms and the general electorate. The argument of market concentration presented in this thesis can be summarized as follows:

***Hypothesis 3:** In comparing developing countries, those being characterized by highly concentrated domestic markets, will be more likely to have high illicit financial outflows through trade misinvoicing than those who have less concentrated markets.*

According to the extended argument that autocratic institutions foster cozy relationships between leading companies and government officials, hypothesis 3 can be augmented in the following way:

***Hypothesis 3a:** In comparing developing countries, those having highly concentrated markets and are under autocratic rule, will be more likely to have high illicit financial outflows through trade misinvoicing than those have highly concentrated markets and are under democratic rule.*

In consideration of the motivational puzzle of Togo and Guinea, rather than the existing theories, the proposed argument is able to explain the significant variation in TMO among these two countries. Togo realized its highest estimates of trade misinvoicing outflows (76% of GDP) in 2008 when at the same time its market concentration (0.18, measured through the Herfindahl–Hirschman Index) reached its peak, too. The GFI estimates for Guinea, on the other hand, record a TMO estimate of only 4% of its GDP in the same year while its market concentration measured by the Herfindahl–Hirschman Index was also significantly lower (0.09). The positive relationship between TMO estimates and the HHI Market Concentration Index is generally evident as can be seen in the illustration in figure 3 and will be further discussed in the empirical section hereafter.

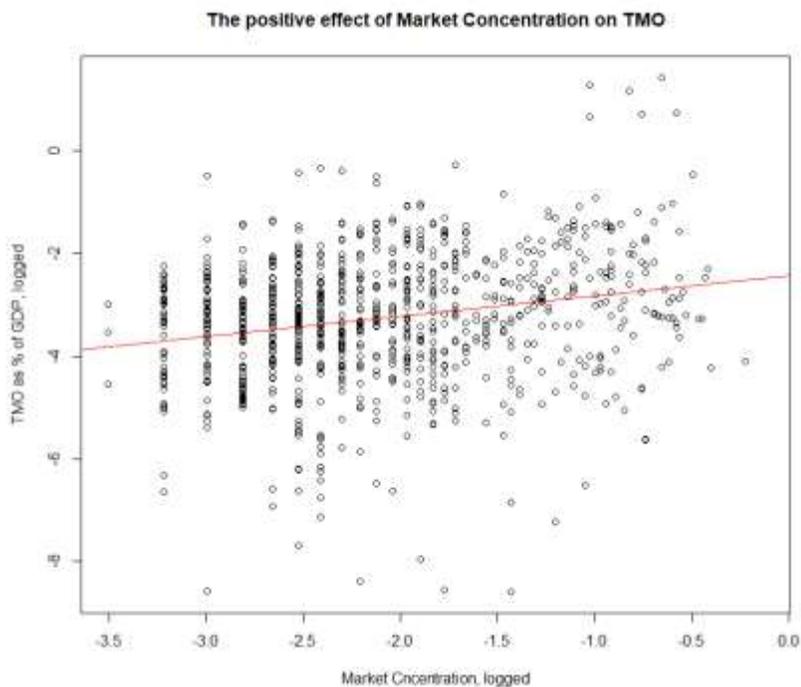


Figure 3: The positive effect of Market Concentration on TMO

CHAPTER 4

RESEARCH DESIGN

This chapter presents a research design that is capable of adjudicating empirically among the competing hypotheses that aim to explain the variation of TMO across countries. It starts by explaining the operationalization of the variables and thereafter presents the basic empirical model for the succeeding regression exercises. A statistical analysis is chosen to test the competing hypotheses, because large-n analyses are capable of examining systematically the influence of different explanatory variables across countries and time.

4.1 The Dependent Variable: Measuring IFF

The selection of the dependent variable is not strait forward various estimation techniques have been developed to measure capital flight and IFF. Therefore, I start with a general discussion of these different techniques before I justify the selection of the dependent variable.

The IMF and the World Bank (WB) started to estimate capital flight in the 1980s. First estimates relied heavily on surveys, case studies, and interviews. Baker (2005) was the first one to apply this strategy explicitly to IFF by conducting 550 interviews with business executives around the world. Ever since, several methods of data collection and statistical measurements have been developed and used to estimate the outflow of capital from developing countries (Fontana, 2010). In order to be able to assess the different measurements, this subsection presents the most popular estimation strategies.

Models based on the Balance of Payments:

1. The World Bank Residual Model

The idea of the WB Residual Model is to measure the difference between the total funds entering a country and the total funds that were actually used by the country (Fontana, 2010, p.1). An increase in foreign debt and incoming foreign direct investment (FDI) are considered as total inflows. Used funds include those funds that were used to finance the current account deficit of the Balance of Payments (BOP) and newly accumulated country's official reserves (Fontana, 2010, p.1). If the incoming funds exceed the used funds, the resulting deficit is considered as money that illicitly flew out of the country (p.1):

*Illicit flows*_{WorldBankResidual}

$$= (\Delta \text{Foreign debt} + \Delta \text{FDI}) - (\text{Current account deficit} + \Delta \text{Reserves})$$

2. The Hot Money Model

The Hot Money Model exploits inconsistencies in the BOP statistics (Mevel et al., 2013). Looking at the BOP, the model considers all errors in a country's external account as illicit flows. The BOP records all financial transactions across countries and follows the double-entry bookkeeping principle (Fontana, 2010, p.2). In theory, the money that enters and leaves a country should net zero. All the money granted to a country as credit should equal the country's outflows plus the money used to pay the debts. In practice, the BOP includes *Net Errors and Omissions* (NEO) to capture the inconsistencies in the statistics. The Hot Money approach assumes this error component to reflect illicit flows (Kar and Cartwright-Smith, 2008).

*Illicit flows*_{HotMoney} = *Net Errors and Omissions*

= *All incoming funds (credit) – All outgoing funds(debt)*

Models based on trade data:

1. Transfer Mispricing

Import and export transactions can be utilized to illicitly transfer money out of a country, i.e. through manipulation of invoices. Multi-national enterprises (MNE) that operate internationally often transfer immediate goods between subsidiaries that operate in different countries. While doing so, they make use of the legal practice of *transfer pricing* (Eden, 2012). Transfer prices arise for accounting purposes in MNEs when single subsidiaries are responsible for their own profits. Companies can use this channel as an illicit method to transfer money abroad if they do not apply the OECD guidelines of the “arm’s length” principle (GFI, 2019). According to this principle, transactions between subsidiaries must be priced the same way as the transaction would be priced among two unrelated firms. The illicit practice of *transfer mispricing* is at place, if one subsidiary that operates in a high tax environment tries to avoid paying taxes by selling its products with a loss, i.e. below comparable market prices, to a subsidiary in a low tax jurisdiction (Eden, 2012).

Le Billon (2011) illustrates in a case study of Zambia that transfer mispricing is commonly used as a channel for capital flight. However, scholars have often struggled to find evidence for transfer pricing as it is extremely laborious to go through myriad transaction documents in order to decide whether the chosen transfer price satisfies the arm-length principle.

As a result, I was not able to detect a standardized estimation method for transfer mispricing on the country level. Furthermore, no reliable estimates seem to exist for a broad country sample.

2. Trade Misinvoicing

The concept of *trade misinvoicing* distinguishes itself from *transfer mispricing* as it does not consider intra-firm tax evasion but focusses on international trade transactions between unrelated parties. For this practice, it is necessary that two parties, a buyer and a seller, collude. Morgenstern (1963) was the first one trying to calculate amounts of trade misinvoicing using partner-country trade data. Scholars such as Ndikumana and Boyce (2001), Beja (2008), and Kar and LeBlanc (2013) advanced and used Morgenstern's (1963) initial concept. In general, funds can leave a country illicitly through trade either by export under-invoicing or import over-invoicing. Export under-invoicing occurs when an exporter reports a value of received money that is smaller compared to the value that the trading partner declares as imports. Similarly, import over-invoicing occurs when importers report a value of imports that is larger than the value declared by trading partners. Taken together and aggregated among all trades, these figures estimate the total flows that leave a country illicitly through international trade.

*Illicit flows*_{TradeMisinvoicing}

$$\begin{aligned}
 &= \left(\sum Imports_{ReportedByTradingPartner} - \sum Exports \right) \\
 &+ \left(\sum Imports - \sum Exports_{ReportedByTradingPartner} \right)
 \end{aligned}$$

Two statistics are available that compile the international trade data, on which trade misinvoicing estimates are based: The Direction of Trade Statistics (DOTS) from the IMF database and the COMTRADE database from the United Nations.

The GFI has published the most conclusive aggregated estimates of IFF on a broad country sample. It combines the estimates from two models, the WB Residual and the Trade Misinvoicing model (Kar and Cartwright-Smith, 2008). Both approaches capture distinct opportunities to siphon money away from developing countries and, for that reason, are added together. As a composite score, they provide a more complete picture of the total amounts that leave a country illicitly. However, as argued above, when trying to identify relevant actors, their motives and the channels used, the aggregation is not particularly helpful. For this reason, other than previous empirical studies (compare Rahman et al., 2018), I focus on illicit financial flows through trade misinvoicing only.

Other leading estimates stem from Ndikumana and Boyce (2012), who gather unrecorded capital flows from anomalies in the capital account, combined with trade misinvoicing estimates for Sub-Saharan African countries. Their dataset differs from the GFI data as Ndikumana and Boyce net off illicit inflows, which results in more conservative estimates. While the GFI argues that “there is no such thing as net crime” (GFI, 2019), Ndikumana and Boyce (2012) argue that gross estimates do not reflect the actual money flows of a country. Furthermore, Pak et al. (2005) and Cobham et al. (2014) also estimated IFF, even though with less comprehensive results (Cobham, 2014). In addition, some studies have focused on illicit stocks rather than flows (e.g. Henry, 2012, and Zucman, 2013). Lastly, Kar et al. (2013) published estimates for *net resource*

transfers, defined as the net of financial and non-financial flows recorded in the balance of payments and unrecorded financial flows for the period 1980-2009 for Sub-Saharan Africa.

Before deciding which estimation data shall be used, one should be aware of the potential errors and the variance in the data of the different estimation methods. All presented models rely heavily on official trade statistics, which are prone to be flawed, especially in the context of developing countries (Mevel et al., 2013). Governments might fail to gather or report statistics correctly. Furthermore, shadow economy activities that operate with illicit money find no representation in official statistics. Therefore, no model will be able to measure illicit flows in its totality (Fontan, 2010). The Hot Money model in particular carries the risk that the NEO position in the BOP reflects a conglomeration of potentially diverse funds. Other errors, which might have no connection to illicit funds, could in- or -deflate this measure (Fontana, 2010). The WB Residual model utilizes raw data from every country instead. The mismatch between the inflows and uses of funds are transmitted directly from a country to the IMF and the WB, which raises the chance that the model yields relatively reliable numbers. Nevertheless, the data might suffer from poor gathering procedures of statistics that are prevalent in many developing countries (Cobham, 2014). Data from the misinvoicing method has the drawback that tracking global industrial production that might include multiple source and destination countries is only imperfectly possible. More broadly, Morgenstern (1963) argues that trading partner statistics suffer from several purely statistical shortcomings that might manifest asymmetries.

Large time deviations might occur when products are shipped over long distances resulting in huge discrepancies between the takeoff and the arrival of goods. Thus, imports and

exports can possibly fall into different accounting years, which circumstance possibly distorts statistics of trade partners.

Taking into account all advantages and disadvantages discussed, I employ estimates from the GFI dataset on IFF, which was published in 2017³. The dependent variable is operationalized by data on trade misinvoicing outflows (TMO) as a percentage of GDP. I choose to use a relative measure of TMO as most explanatory variables will be also operationalized as a percentage of a country's GDP. The relative measures prevent that the results are potentially driven by the sheer economic size of a country. In total, the data comprise 10 years starting from 2005 and include more than 100 countries. Being the most prominent estimates of IFF, prior research (Orkoh et al., 2017; Rahman et al., 2018) used the same dataset to operationalize illicit financial outflows. However, I use the disentangled TMO estimates instead of the aggregate IFF estimates to ensure that the data express corporate outflows through trade, which I theorize to be affected by the market concentration. I do not include illicit capital inflows as the investment diversion theory does not allow illicit capital flight from developed to developing countries. Furthermore, as the GFI publishes both, high and low TMO estimates, I compute averages to work with the most realistic numbers.

The GFI estimates make use of the partner-country trade analysis approach as explained above. The data originate from international trade statistics as published by the United Nations' COMTRADE database. At this point, we should keep in mind that the reliability and accuracy of TMO estimates are highly disputed among scholars. The partner-country trade analysis approach can only detect trade misinvoicing if trade statistics are manipulated unilaterally (Carbonnier and

³ Source: <https://www.gfintegrity.org/report/illicit-financial-flows-to-and-from-developing-countries-2005-2014/>, as of 04/2019

Zweynert de Cadena, 2015). Thus, these estimates should always be considered with reservations (Nitsch, 2012). However, the GFI data is well-regarded in the literature and comprises the broadest country coverage, which makes it most suitable for the following analysis.

4.2 The Independent Variables

The variable that aims to measure the degree of an economy's market concentration is constructed by the frequently used Herfindahl–Hirschman Index (HHI) of concentration. HHI scores for every country on a yearly basis are retrieved from the World Banks' World Development Indicators database. The World Banks' HHI scores measure the market share of all firms operating in the entire domestic market. Sector specific HHI scores are available for certain industries, too. Especially including a particular measure for the market concentration of the trade sector would have been desirable for this analysis, but I failed to generate or find such a measure on a broad country sample. Furthermore, a concentration measure of domestic private-sector banks, as used by Mukherjee et al. (2014), cannot be used in this analysis as the proposed argument does not revolve around the financial sector of a country. Instead, I employ the HHI score that measures the general market concentration of a country while making the reasonable assumption that firms which are engaged in international trade and natural resource extraction are among the most dominant firms in their respective countries. Hence, aggregating all market shares that are controlled by individual firms across the market provides a useful single figure that represents the extent of domestic market concentration (Naldi and Flamini, 2014). The HHI ranges from 0 to 1, with higher values indicating greater concentration in a particular market.

Strictly speaking, the index is the sum of the squared values of market share for all firms in the designated market (Mukherjee et al., 2014):

$$HHI = \sum_{i=1}^N s_i^2$$

, where N denotes the number of firms and s_i denotes the share of firm i in the market. Hence, the HHI is an appropriate measure to proxy the market concentration of an economy and can be used to implicitly gauge the amount of pressure that dominating corporations can exert towards political elites. Thus, I anticipate that higher HHI values correspond to higher values in the dependent variable.

In order to test the market concentration hypothesis against other prevalent theories, I include variables that aim to assess empirically the portfolio choice theory and the social control approach in the context of TMO.

The Political Risk Index (PRI), which is published by the commercial business information provider PRS Group, is used to operationalize economic and political instability. The index consists of 12 dimensions that cover various business risks associated with the political and economic environment of a country. The PRS Group publishes yearly scores since 1984 for 146 countries on a scale from 0 to 100 where a higher score is associated with less risk. The choice for this index is based on the core argument of the investment diversion theory: A commercial index like the PRI is used by companies who are the decision makers in the case of trade misinvoicing. Perceptions of economic and political risks within corporations are thus rather formed by a PRI index than by indices like the World Government Indicators, which are mostly used by academia. More specifically, multinational corporations are the very target group

of the PRI, and include these data into their risk management. Thus, this operationalization captures accurately how the risk environment influences trading firms to pull funds out of developing countries. Higher values of the PRI index should be negatively associated with TMO. The operationalization of the risk environment through the PRI reflects the main argument of the portfolio choice theory in the context of capital flight. From a broader perspective however, any macroeconomic variable that contributes to an unfavorable investment environment might support the validity of hypothesis 1. Therefore, I test the effect of high inflation, unfavorable exchange rates, and excessive government debt on TMO separately.

Furthermore, poor governance, expressed through the inability to control corruption effectively, is measured through the Corruption Perception Index (CPI) from the NGO Transparency International. The index is based on expert assessments and opinion surveys. Yearly data are available from 1998 and comprise 180 countries. Since 2012, scores range from 0 to 100. I rescaled previous scores accordingly. Higher scores are associated with lower perceived corruption. The CPI is commonly used in the IFF literature (compare Rahman et al., 2018). Firms only engage in trade misinvoicing if they do not fear high costs associated with the detection of their illicit activities. By bribing officials they have the option to minimize these expected costs. Thus, the incentives and ability of exporting companies to engage in trade misinvoicing is most accurately gauged by measuring the perceived public-sector corruption through the CPI. Higher values of the CPI are expected to be negatively associated with TMO. As discussed above, the social control approach identifies the lack of enforcement of social contracts as the main driver of capital flight. As the CPI measures the failure of a country to significantly control corruption, this index validly gauges the lack of enforcement of social

contracts. I do not include further additional measures of government effectiveness measures in order to avoid potential multicollinearity among these measures.

Control variables aim to capturing additional factors that might influence the variation of IFF. Drawing on the insights of Orkoh et al. (2017), I include FDI, the exchange rate and an inflation measure as independent variables. Furthermore, building on arguments discussed above, I include variables that capture the degree of globalization, external debt, economic development, development aid and natural resource dependence.

Data on FDI, inflation, the exchange rate, external debt, GDP per capita, development aid (Net Official Development Aid received) and natural resource dependence (total natural resources rents) are all drawn from the WB's World Development Indicators database⁴. FDI, external debt, net ODA and natural resources rents are measured as a percentage of GDP. The KOF index of Globalization⁵ is an index of the degree of globalization of countries and was conceived from the Konjunkturforschungsstelle of ETH Zurich, Switzerland. FitzGerald and Cobham (2000) argue that the global integration of capital markets increase the ease by which firms can move assets abroad. Thus, the KOF index, with its 24 variables covering economic, social and political globalization, appropriately captures how higher degrees of globalization might give fruitful environments to higher trade misinvoicing. Descriptive statistics of all variables are illustrated in table ? in the appendix. Except for GDP per capita, I expect all control variables to be positively correlated with TMO.

⁴ Source: <https://datacatalog.worldbank.org/dataset/world-development-indicators>. Data as of April 2019.

⁵ Source: <https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html>. Data as of April 2019.

4.3 The Model

Countries serve naturally as the unit of analysis in the following regressions. The sample includes all developing countries as defined by the GFI that are not excluded for data availability reasons. Data from the GFI (2017) show that TMO differ across regions but also that trade misinvoicing is present everywhere in the world. However, estimates focus on developing countries only as the investment diversion theory predicts that capital flows from high-risk environments into low-risk environments of developed countries (Vukenkeng and Mukete, 2016). Aiming to analyze both, temporal and within-country variation, TMO estimates comprise the years 2005 - 2014, which is the largest period available for data on trade misinvoicing covering such a broad country sample.

I employ a fixed effects regression model as suggested by previous empirical research that examined the variation of IFF across countries and time (Orkoh et al., 2017). A fixed effects model is appropriate for panel data when regressing on a continuous dependent variable (Greene, 2008). As countries in the dataset differ significantly in economic strength and size country heterogeneity is likely to be correlated with the independent variables. Therefore, I employ unit fixed effects to control for country-specific time-consistent factors.

Conceptual reasons to include fixed effects are particularly strong considering the variation in tax cultures and legal frameworks among the different countries in the analysis.

Furthermore, time dummies account for time-dependent shocks that simultaneously affect all countries. This is necessary as, for example, the financial crisis of 2007-2008 and the corresponding food crisis in the developing world affected international trade in general.

Due to the potential serial correlation in the IFF data (Murinde et al., 2014), I employ robust standard errors as developed by Arellano (1987) to take into account potential autocorrelation and heteroscedasticity. The inclusion of the relevant control variables aim to account for potential omitted variable bias. To satisfy the normality assumptions of OLS regressions, I use log-transformations of the variables that suffer from highly right-skewed distributions. The variables' initial distributions are illustrated in Figure 6 in the appendix.

Model 1:

$$\begin{aligned}
 & \log(TMO)_{i,t} \\
 &= \beta_1 \log(MarketConcentration)_{i,t} + \beta_2 Stability_{i,y} + \beta_3 Corruption_{i,y} + \beta_4 Inflation_{i,t} \\
 &+ \beta_5 \log(ExchangeRate)_{i,t} \\
 &+ \beta_6 \log(ResourceDependence)_{i,t} + \beta_7 \log(ExternalDebt)_{i,t} + \beta_8 GlobalizationIndex_{i,t} \\
 &+ \beta_9 \log(GDPpc)_{i,t} + \beta_{10} \log(NetODAReceived)_{i,t} + a_i + t + \varepsilon_{i,t}
 \end{aligned}$$

CHAPTER 5

FINDINGS

5.1 Results

Table 2: Regression Results for Model 1

Dependent variable: log(TMO.GDP)		
	Random Effects	Country & Year FE
log(MarketConcentration)	0.431*** (0.089)	0.431*** (0.108)
Stability	0.015 (0.011)	0.020 (0.016)
CPI	-0.001 (0.009)	0.005 (0.010)
Inflation	0.004 (0.002)	-0.0002 (0.003)
log(ExchangeRate)	-0.009 (0.047)	0.345 (0.246)
log(ResourceDependence)	0.076 (0.046)	0.085 (0.091)
GI	0.032 (0.022)	0.029 (0.033)
log(GDPpc)	-0.412*** (0.154)	-0.529** (0.269)
log(NetODAReceived)	0.069 (0.058)	0.099 (0.076)
log(ExternalDebtstock)	0.070 (0.123)	-0.067 (0.130)
Constant	-2.383* (1.283)	
Observations	463	463
R2	0.190	0.094
Adjusted R2	0.172	-0.099
F Statistic	10.420*** (df = 10; 452)	3.948*** (df = 10; 381)
Hausmann	p-value = 0.05	

Note: white standard Errors, *p<0.1; **p<0.05; ***p<0.01

The results of model 1 are displayed in the second column of table 2. The regression made use of panel data from 60 countries over 10 years. However, due to some missing estimates, results are based on 463 observations. The coefficient of Market Concentration is positive and highly significant and thereby supporting the hypothesis proposed in this thesis. In fact, the model predicts that a 1% increase in the HHI of market concentration causes a 0.431% increase in TMO as a percentage of GDP. Furthermore, the model supports the argument of Collier et al. (2004), who suggested that less developed countries suffer relatively from higher trade misinvoicing outflows as GDP per capita shows to have a significant negative effect. All other variables, especially those aiming to measure the effects of instability and corruption, are not significant at the 5% level when applying White standard errors, which account for potential heteroscedasticity and autocorrelation in the model. The coefficient signs of the control variables are as expected with the exception of external debt, the CPI score, and political stability. Furthermore, the low R^2 of 0.07 raises doubts about the ability of the model to accurately predict the variation in TMO estimates within countries. Therefore, table 2 includes results of a random effects model in column 1. While the model is able to predict 19% of the variation in TMO, it yields coefficients for external debt and corruption that are in line with the theory. However, results of the Hausmann test suggest a rejection of random effects model in favor of the fixed effects model (p-value: 0.05).

The effect of market concentration depending on regime type

In a second exercise, I include a dummy variable for democracy and test for the interaction effect of market concentration and autocracy. The data for democracy stem from the Polity IV database

that scales regimes from -10 to +10, where higher values are associated with more democratic institutions. Based on the sign of the country score in a respective year, I classify countries as either democratic or autocratic. I anticipate that the interactive effect of market concentration and autocratic systems will be positive and substantial. Full regression results for this exercise can be found in table 5 in the appendix. Figure 4 displays the estimated coefficients for market concentration depending on regime types with their 95% confidence intervals. The results show that contrary to hypothesis 3a, market concentration has a significant positive effect on TMO only in democratic countries. This implies that democracies are more vulnerable to highly concentrated markets in regards of trade misinvoicing outflows. While the respective channel remains unclear, the result suggests on the other hand that autocracies monitor potential illicit activities of trade firms relatively independently of the market size.

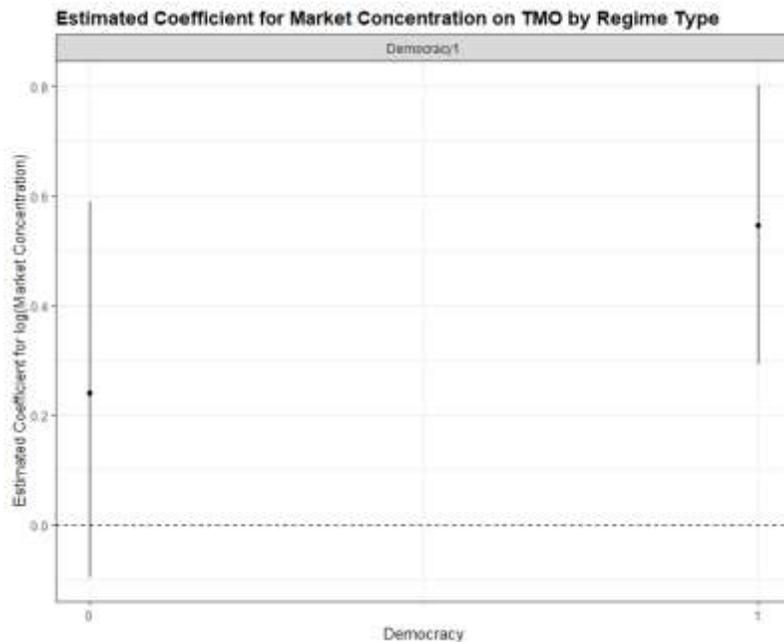


Figure 4: Estimated Coefficient for Market Concentration on TMO, by Regime Types

5.2 Robustness Tests

The appropriateness of the coefficients of model 1 to adjudicate among the proposed hypotheses might be questioned, especially due to the low R² of model 1. One issue that might be prevalent in model 1 is potential over-parameterization due to the abundance of country-dummies in the fixed effects regression. Accounting for this concern, I rerun model 1 after clustering countries in three different ways. Each clustering has the ultimate goal to minimize the country-specific heterogeneity within a single country group while at the same time produce a relative small amount of categories. In a first clustering approach, I group countries according to their region. Thereby, I differentiate between 6 regions: South Asia, Europe & Central Asia, Middle East & North Africa, Sub-Saharan Africa, Latin America & Caribbean and East Asia & Pacific. A second clustering approach groups countries that are comparable in per capita income. I differentiate between: Low income, Lower middle income, Upper middle income and High income. Lastly, I cross apply both categories, generating a total of 21 regional-income groups. The fixed effects regression results are displayed in table 3. Table 3 shows that the reduction of unit dummies benefitted the model fit significantly. The model that grouped countries due to their income levels (column 3) is able to explain the most variation in the dependent variable (adjusted R² = 0.143). Furthermore, all signs of the coefficients produced fit their expectations. While the model predicts that both, political stability and the CPI score of a country, are negatively associated with trade misinvoicing outflows, these coefficients again fail to reach significance.

Table 3: Regression Results for Model 1 with regional and economic size clusters

Cluster:	Region & Income	Region	Income
Dependent variable: log(TMO.GDP)			
log(MarketConcentration)	0.240** (0.104)	0.266*** (0.076)	0.287** (0.145)
Stability	-0.019 (0.024)	-0.020 (0.028)	-0.009 (0.027)
CPI	0.011 (0.020)	0.008 (0.015)	-0.004 (0.009)
Inflation	0.004 (0.004)	0.003 (0.004)	0.008 (0.005)
log(ExchangeRate)	0.041 (0.047)	0.003 (0.045)	0.008 (0.048)
log(ResourceDependence)	0.145** (0.060)	0.125** (0.061)	0.122** (0.052)
GI	-0.006 (0.025)	0.010 (0.014)	0.021 (0.016)
log(GDPpc)	-0.424* (0.228)	-0.129 (0.213)	-0.210 (0.131)
log(NetODAReceived)	0.029 (0.083)	0.127*** (0.043)	0.132*** (0.050)
log(ExternalDebtStock)	0.368** (0.162)	0.275** (0.139)	0.334** (0.138)
Observations	463	463	463
R2	0.163	0.163	0.182
Adjusted R2	0.103	0.117	0.143
F Statistic	4.418*** (df = 19; 431)	4.483*** (df = 19; 438)	5.158*** (df = 19; 441)

Note: Unit and Year FE included, white standard errors, *p<0.1; **p<0.05; ***p<0.01

On the contrary, market concentration stays significance, even though the coefficient drops to 0.287. The model predicts furthermore that resource dependence, development aid and external debts are all significant factors that influence TMO positively. The positive findings for development aid and resource dependence can be interpreted as the identification of certain

sectors, which seem to disproportionately engage in trade misinvoicing. This finding is in line with the large literature on oil rents and rents on natural resources in general (compare Ndikumana and Boyce, 2011). The positive effect of external debts could support both, the portfolio choice or the social control approach. Corporations could be motivated to shift money abroad either by the perception of increased risk factors for the domestic economy or by the expectation of higher future taxation. Indeed, it is very likely that both mechanisms are at place at the same time.

A further critique of the presented results might target the accuracy of the measurement of the dependent variable. As extensively discussed above, trade misinvoicing estimates are criticized for many reasons. In fact, Nitsch (2012) implies that the data does not require the necessary quality standards to be used in statistical analyses, which might contribute to the relatively poor model fits in statistical analyses using these data (compare Orkoh et al., 2017; Rahman et al., 2018). Considering these doubts on the quality of the GFI estimates, I employ a logit regression model that captures only the following observations in the dependent variable: High trade misinvoicing outflows (=1) or low trade misinvoicing outflows (=0). While this approach is not able to capture the granularity in the dependent variable, its results will give additional support to the general robustness of the previous results. In a first regression, a country is coded 1, if it exceeds the cutoff level of 10% of its GDP in the respective year and 0 otherwise. The chosen cutoff level for a second analysis is 20%. I present the results of the two logit analyses in table 6 in the appendix. As in all other reported regressions, unit and year effects are included. In addition, figure 5 shows the marginal effects of every variable when all

other variables are hold constant at their means. It also illustrates the respective 95% significance intervals, from which one can infer the significance of a variable.

Both regression results support the validity of hypothesis 3. Furthermore, figure 5 suggests that the model predicts a positive marginal effect of external debt, development aid, GDP pc and inflation on TMO.

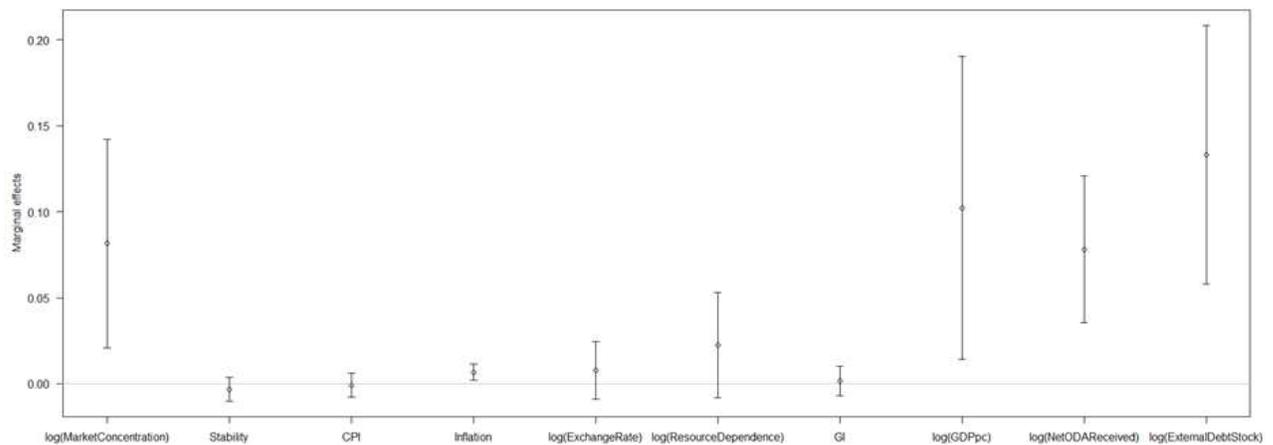


Figure 5: Marginal Effects Plot for logit with cutoff = 20%

As a next robustness test, I rerun model 1 with yet another alternative dependent variable. Since most previous researchers tend to regress variables on absolute numbers of trade misinvoicing (compare Orkoh et al., 2017). I include GDP to control for the variation in size between the different economies. Regression results of this exercise are displayed in column 1 in table 7 in the appendix. However, besides the fact that GDP per capita contributes positively to TMO, this model mainly reproduces general results from the baseline model. Lastly, as previous capital flight might cause future capital flight, a lagged TMO variable is added as an additional

independent variable to the analysis (column 2 in table 7). Again, the coefficient for market concentration stays significant and robust in size (0.43). Furthermore, when accounting for the influence of previous illicit outflows, the coefficient for the globalization index shows significance at the 1% level, indicating that higher globally integrated countries experience higher TMO, as theorized by Bouchet (2012).

CHAPTER 6

CONCLUSION

This Master thesis has tackled the research question why some developing countries suffer from high illicit financial flows, especially through trade misinvoicing, while others do not. Illicit capital flows from developing countries need to be better understood as they have adverse effects on the domestic economy and the government's budget. Le Billion (2011, p.10) points out that they undermine private investment and hurt government revenues through tax evasion practices. Furthermore, IFF have the side-effect to encourage illegal activities such as transfer mispricing by establishing transfer networks and intensify existing inequalities at the expense of the public (Le Billion, 2011, p.10). Additionally, the importance of the topic of IFF becomes apparent when considering that Sub-Saharan African countries are estimated to have lost USD 814 billion in the period from 1970 to 2010, which exceeds the amount of FDI (USD 306 billion) or official development aid (USD 659 billion) that these countries received over the period (Ndikumana and Boyce, 2012). Motivated by the example of Togo and Guinea, this thesis highlights the importance of the domestic market structure in developing economies as an explanatory factor for IFF.

The presented work significantly contributes to existing research by developing an explicit causal mechanism that explains how high domestic market concentration influences trade misinvoicing practices positively. Briefly worded, it argues that private sector firms in developing countries strive for relative freedom in profit-generating activities and profit-shifting practices to be as profitable as possible. Thus, these firms have incentives to lobby politicians to relax controls on their operational practices. A high market concentration limits the number of

relevant players. Hence, they will more easily overcome collective action problems associated with lobbying and, at the same time, the higher market concentration of firms makes politicians more responsive towards these demands as the economic performance of a country is highly dependent on the performance of these concentrated firms. Large firms that engage in international trade will exploit this granted latitude by shifting funds abroad through trade misinvoicing for the various reasons such as tax avoidance or portfolio diversification.

A second contribution to existing research is made by testing the proposed hypothesis empirically. The chosen research design controls for other widespread theories in the context of IFF. A fixed effects model analyses the variation of trade misinvoicing within countries using data from 60 developing countries in the period of 2005-2014. The results show that economies, which are characterized by highly concentrated markets, experience significantly more illicit financial outflows than economies with less concentrated markets. These major findings are supported by robustness checks that include, *inter alia*, additional regression exercises with clustering of countries due to regional and income similarities as well as a logistic regression model. Moreover, further results suggest that the positive effect of market concentration is only significant in democratic developing countries. In addition, the analysis gives support to several previous findings. The results especially reaffirm the importance of the natural resource sector as a major channel in trade misinvoicing

There are plenty opportunities for future research to improve our today's understanding of illicit financial flows. First of all, empirical academic work is always limited by the quality of the data collection process, which still tends to be of weak quality in many developing countries (Fontana, 2010). Hence, the need for improved data collection systems cannot be overstated, on

which solutions scholars, governments and international organizations need to work hand-in-hand. This is especially true for estimates on IFF as frameworks for estimating global amounts of transfer mispricing are yet to establish. Furthermore, future research might want to test the market concentration argument on refined data that only considers the structure of the trade market. Otherwise, there is plenty room to identify additional possible explanatory variables. Especially the view that trade misinvoicing is part of the global economic system and as such depends largely on pull factors from developed countries might be followed up by future research.

The findings presented in this thesis have direct policy implications. First and foremost, it brings to mind the perils of market dominating corporate behavior, especially in the interplay with political elites in developing countries. This thesis recommends that governments in developing countries must fight the increasing market dominance of key players in international trade. These governments should actively take measures to prevent new monopolies and market dominating firms to arise and try to limit the systematical relevance of the existing ones. Therefore, policies on merger controls should be revised, also with the support of international organizations. Furthermore, firms that generate rents from natural resources should be more closely scrutinized through independent third parties. Moreover, developing governments are advised be more careful in choosing among firms whom they grant the rights to exploit the countries' natural resources.

APPENDIX

ADDITIONAL STATISTICS

Table 4: Descriptive Statistics

variable	n	mean	sd	median	min	max	range	skew	kurtosis
TMO	1117	4544.71	12673.35	861.58	0.23	135300	135300	5.76	38.32
TMO.GDP	1037	0.08	0.24	0.04	0	4.2	4.2	12.15	174.24
Stability	1000	61.34	10.34	61.54	23.04	86.42	63.38	-0.45	0.58
CPI	1331	33.29	13.1	30	8	78	70	1.13	1.03
MarketConcentration	1173	0.16	0.14	0.11	0.03	0.88	0.85	2.06	4.83
Inflation	1431	7.74	9.66	5.88	-27.63	100.6	128.3	2.86	19.4
ExchangeRate	1279	812.18	2719.77	28.01	0.27	25000	25000	5.21	30.52
ResourceDependence	1435	11.01	13.65	5.15	0	64.11	64.11	1.68	2.34
GlobalizationIndex	1439	55.55	11.63	55.44	24.12	86.1	61.97	-0.01	-0.51
GDPpc	1439	6107	9459.65	3196.65	150.51	88560	88410	4.26	25.05
GDP	1439	151013.4	615563.2	15929.9	108.55	10480000	10480000	10.71	143.01
FDI	1441	5.42	7.43	3.61	-18.01	103.3	121.3	5.15	47.33
Democracy	1255	0.63	0.48	1	0	1	1	-0.55	-1.7
NetODAReceived	1286	5.7	8.48	2.66	-0.68	92.14	92.82	3.77	23.02
ExternalDebtStock	1149	47.25	53.61	35.01	1.04	1002	1001	10.65	165.14

Table 5: Regression Results with Interaction: Market Concentration*Democracy

Dependent variable:	log(TMO)
log(MarketConcentration)	0.239 (0.159)
Democracy1	0.569 (0.407)
log(MarketConcentration)*Democracy1	0.304 (0.191)
stability	0.019 (0.014)
CPI	0.008 (0.010)
Inflation	0.001 (0.003)
log(ExchangeRate)	0.487* (0.279)
log(ResourceDependence)	0.081 (0.096)
GI	0.033 (0.038)
log(GDPpc)	0.183 (1.109)
log(GDP)	0.253 (1.150)
log(NetODAReceived)	0.101 (0.065)
log(ExternalDebtStock)	-0.113 (0.137)
Observations	446
R2	0.075
Adjusted R2	-0.134
F Statistics	2.26301*** (df = 13; 363)

Note: White-Standard Errors, Country & Year FE,
*p<0.1; **p<0.05; ***p<0.01

Table 6: Regression Results Logit Models

	Dependent variable:	
	TMO.10 (1)	TMO.20 (2)
Log(MarketConcentration)	0.461*** (0.177)	1.329*** (0.268)
stability	-0.018 (0.020)	-0.058* (0.030)
CPI	-0.006 (0.020)	0.014 (0.030)
Inflation	0.038*** (0.014)	-0.005 (0.016)
Log(ExchangeRate)	0.044 (0.048)	0.042 (0.070)
Log(ResourceDependence)	0.127 (0.088)	0.146 (0.139)
GI	0.009 (0.025)	0.054 (0.038)
Log(GDPpc)	0.579** (0.257)	-0.104 (0.364)
Log(NetODAReceived)	0.442*** (0.126)	0.188 (0.170)
Log(ExternalDebtStock)	0.753*** (0.221)	0.755** (0.326)
Constant	-6.805*** (1.973)	-1.703 (2.708)
Observations	463	463
Log Likelihood	-233.900	-133.300
Akaike Inf. Crit.	507.700	306.600

Note: Unit and Year FE included, *p<0.1; **p<0.05; ***p<0.01

Table 7: Regression Results of Model 1 with DV: TMO in Mio USD & lagged DV

Dependent variable:	log(TMO)	log(TMO.GDP)
lag(log(TMO.GDP))		0.030 (0.078)
log(MarketConcentration)	0.456*** (0.104)	0.432*** (0.147)
Stability	0.013 (0.014)	0.020 (0.015)
CPI	0.009 (0.010)	0.007 (0.012)
Inflation	0.001 (0.003)	0.001 (0.003)
log(ExchangeRate)	0.253 (0.231)	0.047 (0.255)
log(ResourceDependence)	0.145* (0.086)	0.055 (0.098)
GI	0.030 (0.029)	0.069*** (0.026)
log(GDPpc)	0.500*** (0.186)	-0.699 (1.256)
log(GDP)		0.132 (1.294)
log(NetODAReceived)	0.099 (0.076)	0.101 (0.068)
log(ExternalDebtStock)	-0.126 (0.127)	-0.152 (0.181)
Observations	463	397
R2	0.131	0.112
Adjusted R2	-0.029	-0.117
F Statistic	5.896*** (df = 10; 390)	3.306*** (df = 12; 315)

Note: Unit and Year FE included, white standard errors,
*p<0.1; **p<0.05; ***p<0.01

Table 8: Countries included in the analysis

Armenia	Guatemala	Nicaragua
Azerbaijan	Guyana	Peru
Burkina Faso	Honduras	Philippines
Bangladesh	Indonesia	Papua New Guinea
Bolivia	India	Paraguay
Brazil	Jamaica	Sudan
Botswana	Jordan	Senegal
China	Kazakhstan	El Salvador
Cote d'Ivoire	Kenya	Togo
Cameroon	Lebanon	Thailand
Congo, Rep.	Sri Lanka	Turkey
Colombia	Morocco	Tanzania
Costa Rica	Moldova	Uganda
Dominican Republic	Madagascar	Ukraine
Algeria	Mexico	Venezuela, RB
Ecuador	Mali	Vietnam
Egypt, Arab Rep.	Mozambique	Yemen, Rep.
Gabon	Malawi	South Africa
Guinea	Niger	Zambia
Gambia, The	Nigeria	Zimbabwe

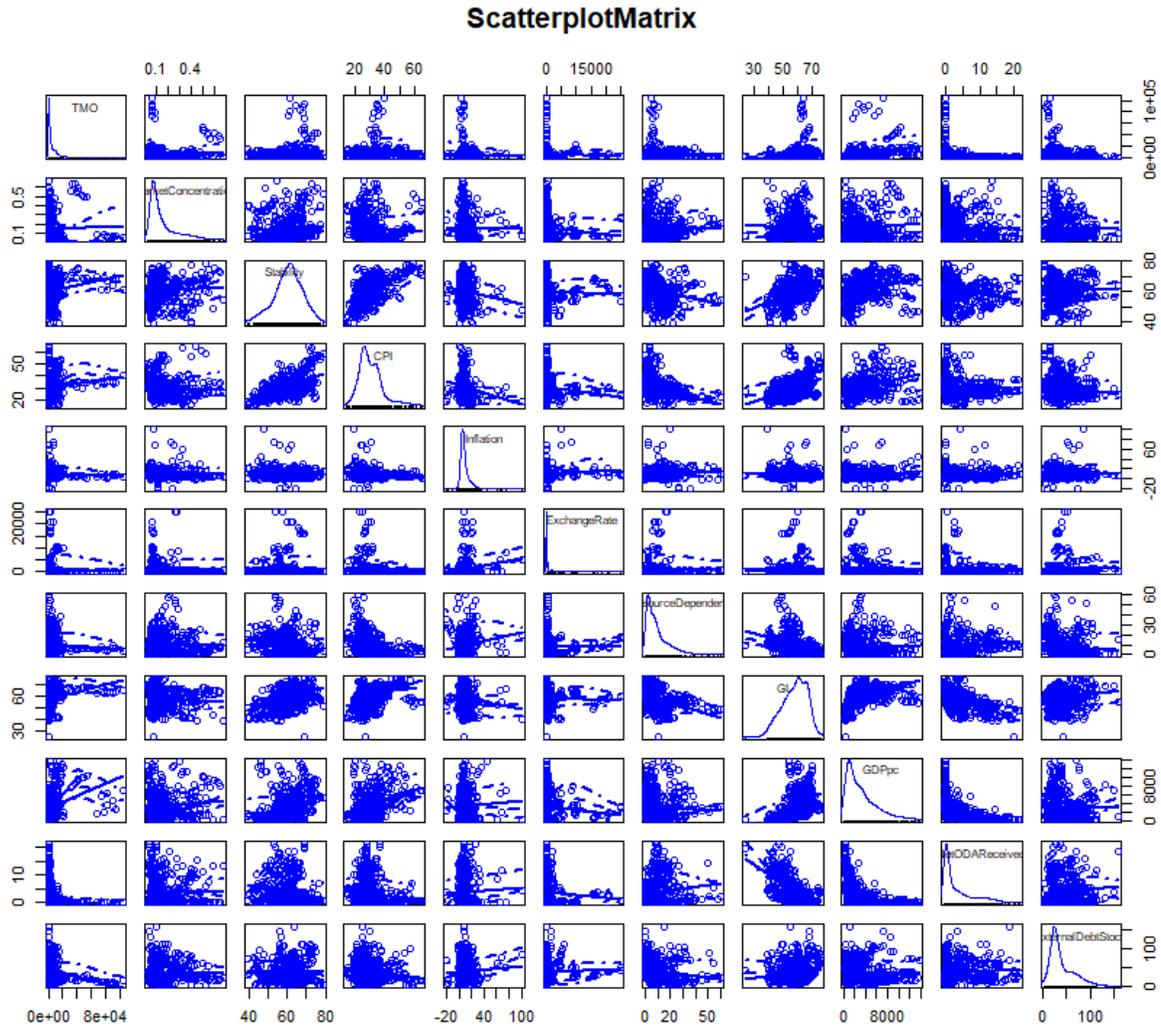


Figure 6: Scatterplot Matrix

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BIOGRAPHICAL SKETCH

Martin Kohl was born January 1994 in Floersheim, Germany. After completing his high school career in his hometown, he participated in a volunteer program offered by the Diocese of Limburg, Germany, where he worked for one academic year in a primary school in Ndola, Zambia. Thereafter, he joined the Goethe University of Frankfurt for their Bachelor of Science program in Economics. In this time, he gained work experience in several internships. After receiving his degree, he subsequently entered a graduate program in International Political Economy (dual degree) that is jointly offered by the Philipps University of Marburg and The University of Texas at Dallas.

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WORK EXPERIENCE

- 10/2017 – 04/2018 **Working student - Allianz Global Investors**
Asset Management: Multi-Factor Equity Investing
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- 05/2017 – 09/2017 **Intern - Deloitte**
Consulting: Forensic Services
• Acquisitions, Research & Projects in Anti-Money Laundering and
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- 09/2014 – 02/2015 **Working student - Concerto Financial Solutions**
Financial Data Services: Index Provider
• Product Development & Index Pricing

VOLUNTEERING

- 07/2012 – 07/2013 **International Volunteer Service - Diocese Limburg & Weltwearts**
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• Primary School Teacher

ADDITIONAL SKILLS

- Languages • German - Native
 • English - Fluent
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 • SQL & VBA - Proficient
 • R - Intermediate