







“Do not mention Russia: A theoretical framework for bank penalties due to economic sanction violations and policy implications”

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ARTICLE INFO	Václav Brož, Domenico Pace, Bruce Gahir, Thomas Draper and Stefano Cavagnetto (2023). Do not mention Russia: A theoretical framework for bank penalties due to economic sanction violations and policy implications. <i>Banks and Bank Systems</i> , 18(2), 161-176. doi: 10.21511/bbs.18(2).2023.14
DOI	http://dx.doi.org/10.21511/bbs.18(2).2023.14
RELEASED ON	Thursday, 08 June 2023
RECEIVED ON	Tuesday, 17 January 2023
ACCEPTED ON	Thursday, 23 February 2023
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Banks and Bank Systems"
ISSN PRINT	1816-7403
ISSN ONLINE	1991-7074
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

39



NUMBER OF FIGURES

8



NUMBER OF TABLES

0

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 17th of January, 2023

Accepted on: 23rd of February, 2023

Published on: 8th of June, 2023

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Cavagnetto, 2023

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Conflict of interest statement:

Author(s) reported no conflict of interest

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DO NOT MENTION RUSSIA: A THEORETICAL FRAMEWORK FOR BANK PENALTIES DUE TO ECONOMIC SANCTION VIOLATIONS AND POLICY IMPLICATIONS

Abstract

In this paper, penalties to banks violating economic sanctions have been investigated and discussed. This topic has sparked renewed interest and attention following the beginning of the conflict in Ukraine due to the Russian aggression in February 2022 and the ongoing general deterioration in the global economic climate. Thus, based on the experience with penalties to banks for violations of economic sanctions from 2007, a theoretical model has been proposed. It is proposed that this model may be informative in devising the optimal level of penalties based on behavioral characteristics of banks and regulators. The model is based on the economic examination of the motives and incentives for bank misconduct, by drawing on the Shapiro-Stiglitz model addressing typical consequences of asymmetric information in principal-agent models. From a policy perspective, the proposed model also has the potential to provide opportunities for standardization of restrictions posed on banks as a result of bank misconduct. Relevant policy implications concerning penalties are put forward that may be implemented for future considerations, particularly in cases related to violations of economic sanctions.

Keywords

banking sector, penalty, economic sanctions, corporate
misconduct, law enforcement, regulation, global
financial crisis

JEL Classification

C14, G21, K42

INTRODUCTION

After the beginning of the Russian invasion of Ukraine in 2022, allies of Ukraine have implemented several rounds of economic and other sanctions against Russia. In particular, these measures are aimed at Russian commercial banks as well as the central bank, and in fact, to some extent, are aimed at isolating Russia from the global financial system.

Arguably, these developments open room for illegal ways how Russian economic agents can access the perks of the Western financial world. And based on the experience from this century so far, there can be financial intermediaries – especially banks – in the West that are willing to conduct such illegal operations that circumvent the present economic sanctions. However, such misconduct typically causes reactions of regulatory and enforcement authorities in the United States in the form of serious financial penalties to Western banks.

To contribute to the discussion on this relevant topic, this paper offers a novel theoretical model both examining banks' motives for breach-

ing economic sanctions and deriving the optimal level of penalties along with several implications for policymakers how to act both preventively and retroactively to punish potential future violations of economic sanctions against Russia.

1. THEORETICAL BASIS

1.1. Overview of the state of empirical and theoretical research on bank penalties

When thinking of banks and banking, usually their deposits or potentially loans, the bank's profits, the shiny buildings they own or even about trust that is essential for the banking systems to operate, even in times of financial crises are the first things coming in mind (Fiordelisi et al., 2014; Knell & Stix, 2015). However, also financial penalties from regulatory authorities can be added to this list as they have been a part of banks' daily life since the outburst of the global financial crisis in 2007, much more than before it (Emmenegger, 2015; Garrett, 2016; Flore et al., 2021). Also, nothing signals that the future will be any different in this regard (Brož & Kočenda, 2022).

A special type of penalties is that granted for violations of economic sanctions. They have been recurring in the 2010's and accounted for about 8% of all penalties levied by U.S. authorities in the period from 2010 to 2021, with a price tag of almost 20 billion USD based on the data by Good Jobs First (2022) and Financial Times (2015). Even more importantly, there might be a renewed interest in such penalties in the wake of the economic sanctions against Russian banks and other entities since the start of the Russian invasion into Ukraine (Funakoshi et al., 2022).

Results of this paper proposes a theoretical model that examines banks' motivation to misconduct in an environment where a regulator aims to punish illegal behavior in the banking sector by levying a penalty as a compensation (Flore et al., 2021). Arguably, such a framework might be useful for considerations regarding penalties for economic sanction violations. In particular, authorities might strive to understand how to optimally punish the misconduct based on the previous experience so that the regulatory or the law enforcement will have the desired deterrent effect in the future.

On a more general level, this work aims to contribute to an understanding why banks continue to pay penalties even after all their previous experience with the punitive acts of regulatory enforcement. Indeed, the motives of misconduct in general in the banking sector have not been explored before, despite its importance to a more complex grasp of the topic (Koester & Pelster, 2017). This includes the pertinent question of the effectiveness of regulatory enforcement. The only relevant empirical findings, however, suggest that regulatory penalties might not help in changing banks' behavior as there is typically a significant time lag between the misconduct and the penalty (Brož & Kočenda, 2022). Also, the intention of regulators is most likely not to fatally affect the banks' operations as they consider the importance and interconnectedness of the banking sector when deciding about a potential criminal prosecution (Flore et al., 2021). Indeed, the fact that penalties and an out-of-court settlement are discussed and regular praxis means that there are very few cases of criminal cases, especially against the largest banks in the world (Gilchrist, 2014). Thus, apart from being Too Big to Fail, it might seem that they are also to some extent above the law (Garett, 2014). This experience also opens room for assessment if penalties are an adequate punishment for the misconduct by banks.

In general, this study falls within the strand of literature that assesses regulatory penalties in the area of banking. Arguably, this research area is still emerging as traditionally, economic studies have been in general focusing on the impact of financial penalties on stock prices while disregarding the industry sector as a potential dimension of the analysis (for a relevant meta-analysis, see De Batz and Kočenda (2020)). Still, there has been a recent focus on the study of the impact of penalties on banks' stock prices and profits (Koester & Pelster, 2017; Flore et al., 2021), default risk (Flore et al., 2021) or the systemic risk that they pose for the banking sector as such (Koester & Pelster, 2018; Brož & Kočenda, 2022). Also, worth to be mentioned are papers that tackle the topic of penalties

from the perspective of law or international politics (Gilchrist, 2014; Emmenegger, 2015). Thus, it can be claimed that the topic of interest is rather of an interdisciplinary nature.

The existing literature, however, offers several useful insights that have some relevance while examining the development of penalty models that align to some of the motives of banks for misconduct and the resulting penalties. In this way, Koester and Pelster (2017) find that investors are content with the closure of litigation cases that result in penalties. Their interpretation of the situation – quantitatively manifesting itself in higher returns on the corresponding banks' stocks – reveals that financial market participants do not have any material issue with the way how the banks deal with the aftermath of the misconduct. Arguably, investors might even expect stronger corporate governance practices to limit future exposure to criminal or civil proceedings (Haslem, 2005). However, it is up to debate (and further research) if penalties lead to governance changes and higher transparency that decrease the probability of misconduct in the future. The literature offers both an optimistic (Marchionne et al., 2021) and a pessimistic (Flore et al., 2021) assessment in this regard.

Also, Koester and Pelster (2017) argue that some banks might see litigation costs, including penalties simply as part of doing business within the banking and financial sector. More specifically, they find that penalties are in general smaller than the actual gains from the misconduct. This means that in a purely accounting term, shareholders might even benefit from the misconduct, which is something a regulator has to bear in mind. Such circumstances might indeed do little to discourage banks from pursuing specific market strategies that might be profitable and if not punished, even bring abnormal returns. Also, the signal to the banking sector as for potential future misconduct might not be sufficiently deterrent, especially if one considers that banks know about their profitable misconduct along with the non-zero chance of being punished (Gilchrist, 2014).

Furthermore, other reasons can be found on why shareholders or investors might be satisfied with the seemingly harsh punishment. First, it is true that the fact that most of the cases result in a set-

tlement between the regulatory authority and a bank, indicating that the bank might have well escaped an even harsher verdict while not admitting to its guilt in an explicit way (Haslem, 2005). Second, the accounting treatment of penalties in the United States, as well as, for instance, in Germany allows for their deduction from the taxable income. This means that the after-tax profits will not be in general affected by penalties in certain jurisdictions (Koester & Pelster, 2017). Still, it can be said that with the exception of Germany, penalties will have a more pronounced impact on European banks in comparison to their U.S. counterparts. Finally, the negative impact of penalties might be further contained by the fact that banks seem to have an ability to estimate the size of the penalties (Flore et al., 2021). This clearly opens a door for timely disclosure by the punished banks that might further reassure investors.

However, even when considering certain favorable conditions for banks with respect to penalties, it is still true that apart from direct litigation costs, it can also face indirect costs, mainly of the reputational character. These might be considerably higher than the litigation costs, might in their effect lower future cash flows and imply a higher probability of bankruptcy (Karpoff & Lott, 1993). The transmission channel of the higher default risk will be a lower demand for the bank's products and higher costs of doing business (Murphy et al., 2009). Rating downgrades might play a role, too (Flore et al., 2021). The empirical evidence as for reputational costs, however, is scarce, according to Flore et al. (2021) and Marchionne et al. (2021), and establishing no severe reputational effects in the international and the Italian context, respectively. On balance, a bank might still at least compare advantages and disadvantages of its potential illegal behavior.

The focus of the present paper is to assess bank penalties the perspective of U.S. regulatory authorities as they are much more active in pursuing banks' misconduct than their European counterparts (Flore et al., 2021). The crucial reason is that U.S. authorities can rely on the global importance of the U.S. financial system as well as the U.S. dollar in pursuing misconduct (Emmenegger, 2015). In any case, penalties are of a higher relevance for financial markets in the U.S. compared to other

markets (De Batz & Kočenda, 2020). Moreover, Flore et al. (2021) find that higher penalties mean higher systemic risk in the U.S. context, with Brož and Kočenda (2022) corroborating that systemic risk due to bank penalties propagates over the long term (a business year). Nevertheless, it has to be distinguished if the penalty (or the litigation case) is announced or closed. The difference pronounced as long-term systemic risk is shown to increase after an announcement of a penalty but it decreases after the settlement by reducing uncertainty for banks with similar lawsuits (Flore et al., 2021; Brož & Kočenda, 2022). In any case, systemic risk has to be assumed when thinking about penalties from the perspective of regulators, because this can lead to problems of banks in the crucial area of financial intermediation (European Central Bank, 2016). At the same time, there seems to be an increasing trend in penalties in the period after the global financial crisis (Flore et al., 2021; Brož & Kočenda, 2022), again underscoring the systemic relevance of regulatory actions.

1.2. Motivation for the analysis of economic sanction violations

In this section, one type of penalty is discussed in detail – those related to violations of economic sanctions enacted by the United States. First, the financial significance of this class of penalties is demonstrated. Next, information from several large cases is synthesized to discuss the motivation of the banks, as well as the regulators, in the case

when economic sanctions are violated. Finally, an overview of the sanctions against Russia due to its war against Ukraine as of the first half of 2022 is provided and a notion why penalties for economic sanctions violations might be again relevant in the upcoming years is discussed.

In terms of financial significance, penalties levied by U.S. authorities to banks for economic sanctions violations amounted to almost 22 billion USD in the period from 2007 to 2021, based on the data from Good Jobs First (2022) and Financial Times (2015). With respect to other types of penalties that U.S. regulators produced, the penalties for sanctions account for around 7% of the total 336 billion USD. Moreover, a vast majority of the overall volume of penalties for financial firms (94%) was levied on banks and thus, it will be the focus of the analysis below.

There were 47 cases of penalties for economic sanction violations in the sample period. Most of the penalties were lower than USD 100 million but there were also several cases of much higher penalties (Figure 1). Until now, the largest penalty on record has been that of USD 9 billion to BNP Paribas in 2015. On the other hand, the mean and the median penalty are much lower, USD 504 million and USD 2.9 million, respectively.¹ The size assessment of penalties for economic sanctions violations are in line with previous research who estimate that mean penalties in this category are between USD 500 and 1,000 million (Koester &

Source: Good Jobs First (2022), Financial Times (2015).

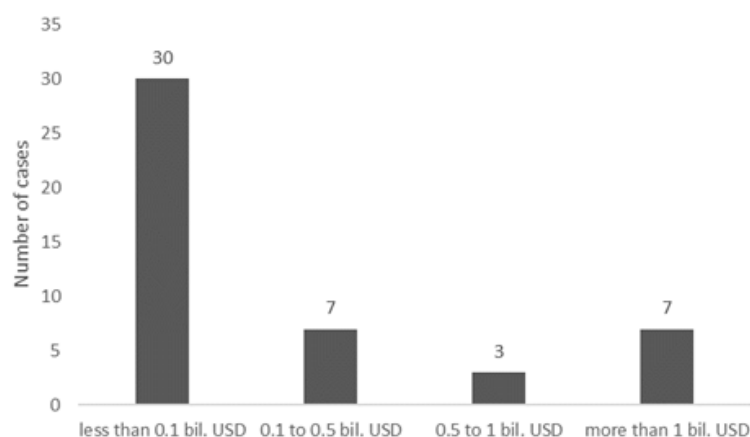


Figure 1. Number of penalties in different size categories

¹ The lowest penalty for economic sanction violations amounted only to 7.5 thousand USD.

Source: Good Jobs First (2022), Financial Times (2015).

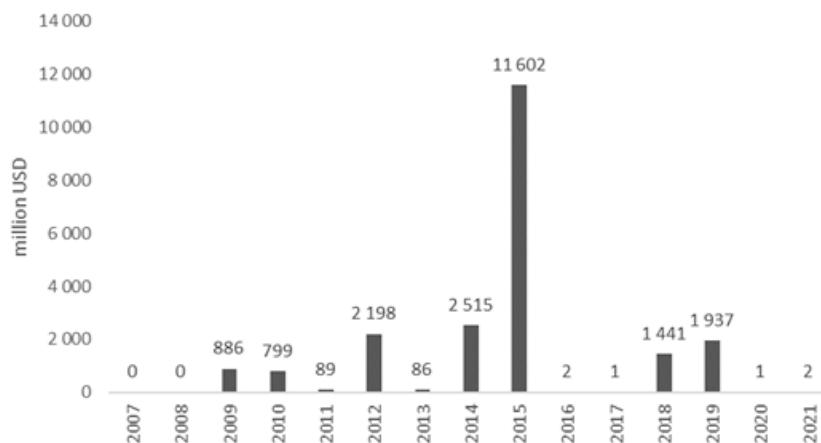


Figure 2. Time series of penalties for economic sanction violations

Pelster, 2017). The relatively substantial share of the penalty can be explained by the fact that sanction violations are in general subject to criminal law and not civil law.

Regarding the time series of penalties, there seem to be both more and less significant years. In the former ones, the total amount levied on financial institutions might be close or over USD 1 billion— even far over as in 2012, 2014 and 2015 (Figure 2). In the most recent years, however, penalties for sanction violations were scarce. Still, in some years, penalties for economic sanction violations constitute a sizable share of the overall penalties levied. That has happened twice so far – in 2015 when 42% of all penalties were due to economic sanction violations and again in 2019 when it was exactly one half.

Interestingly, the U.S. regulators typically punished European banks which account for 99.5% of all penalties (Figure 3). Next, penalties for sanction violations were levied mostly with respect to transactions to Iran, Sudan, and Cuba (Figure 4). Less frequent was trading with counterparties from Myanmar and Libya. There were also single cases of violations of sanctions against Zimbabwe and North Korea. In only a few cases, it was not disclosed which country was the counterparty that the business had been done with. The case that accrued the largest amount of penalties was that when a bank conducted transactions with three sanctioned counterparties, with Iran, Cuba and Sudan being the most frequent combination of all (Figure 5).

Source: Good Jobs First (2022), Financial Times (2015).

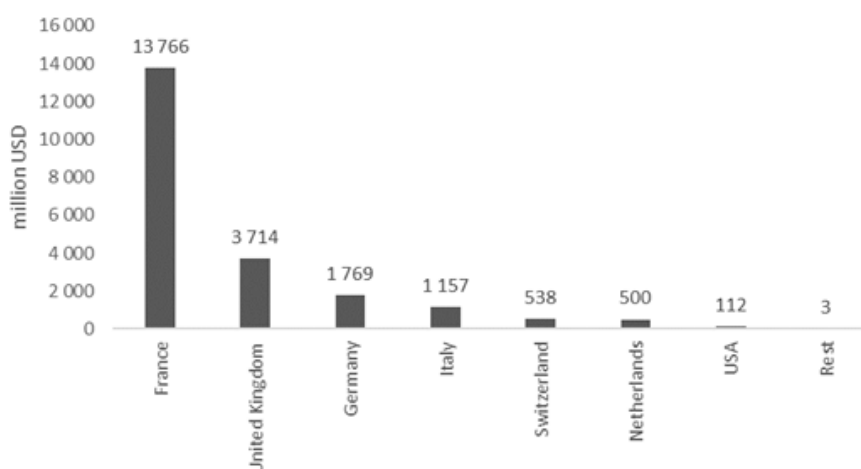


Figure 3. Country of origin of the punished banks

Source: Good Jobs First (2022), Financial Times (2015).

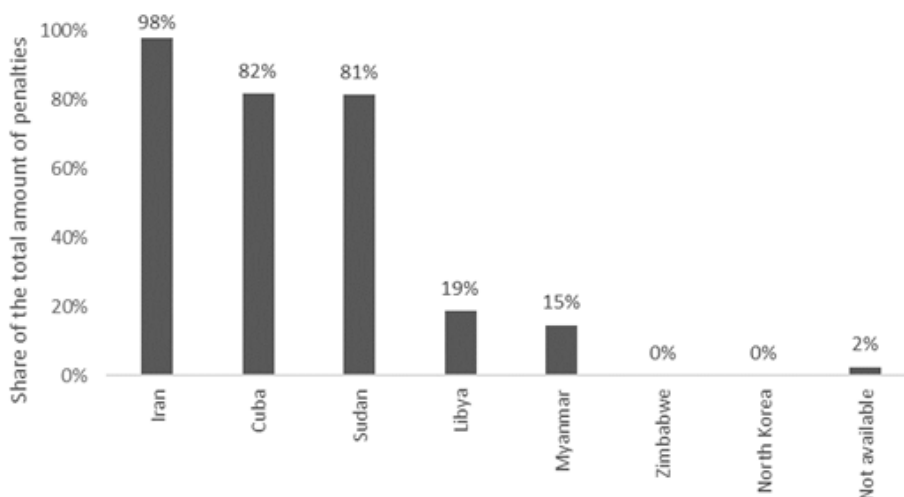


Figure 4. The sanctioned counterparties that the banks did business with

Source: Good Jobs First (2022), Financial Times (2015).

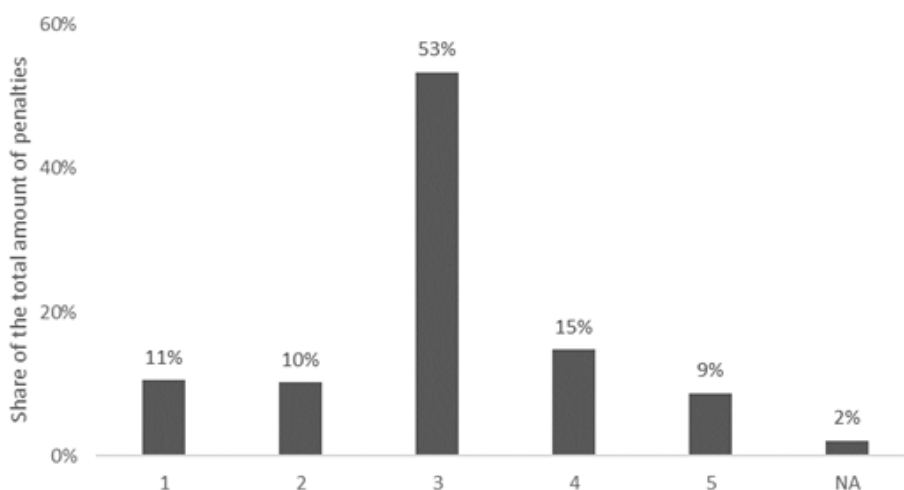


Figure 5. The number of sanctioned counterparties in individual cases

As mentioned earlier, BNP Paribas received the largest penalty for economic sanction violations (almost USD 9 billion, as detailed in The United States Government Department of Justice, 2015) so it might not be surprising to see it, as the bank that had to pay the largest volume of penalties overall (Figure 6). Still, there were also several other seminal cases, such as the USD 1.6 billion penalty to HSBC (The United States Government Department of Justice, 2012), the USD 1.5 billion penalty to Commerzbank (The United States Government Department of Justice, 2015b), the USD 1 billion penalty to Credit Agricole (The United States Government Department of

Justice, 2015c). The more recent cases include the 1.4 billion settlement of Société Générale (The United States Government Department of Justice, 2018) or the 1.3 and 0.8 billion USD settlement of UniCredit (The United States Government Department of Justice, 2019) and Standard Chartered (The United States Government Department of Justice, 2019b), respectively.

From the point of view of state authorities, several observations should be mentioned based on these seminal cases. First, the effort to punish the misconduct of banks is commonly a joint work of the FBI, law enforcement and federal regula-

Source: Good Jobs First (2022), Financial Times (2015).

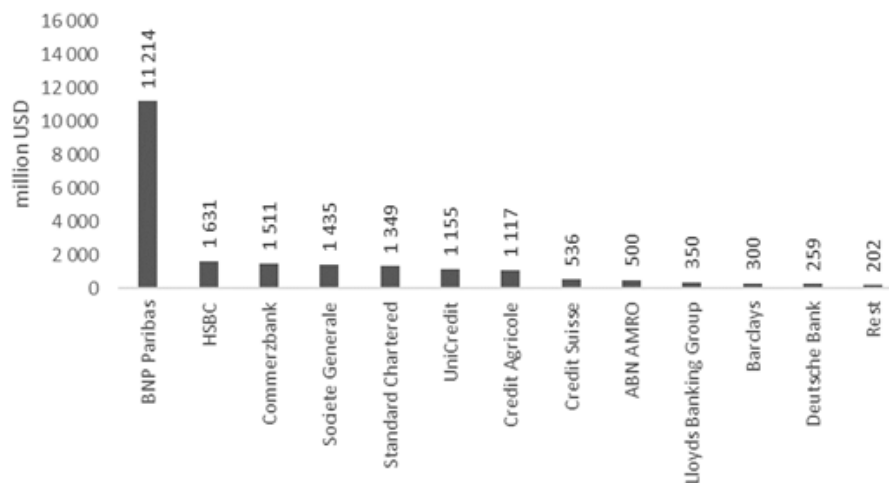


Figure 6. Total penalties by individual banks

tors (The United States Government Department of Justice, 2012). Typically, the United States Government Department of Justice is included as the cases are of a criminal nature. The rationale for the punishment is various where authorities seek compensation for endangering the national security of the United States (The United States Government Department of Justice, 2015), want to promote integrity across financial institutions worldwide (The United States Government Department of Justice, 2012), as well as democratic values (The United States Government Department of Justice, 2019b) or U.S. foreign policy interests (The United States Government Department of Justice, 2015b; 2015c) or aim to safeguard the market economy (Gilchrist, 2014). However, even more importantly, the authorities want to discourage other banks from doing similar crimes by promising to be similarly harsh in the future as well, even to the largest globally relevant banks (The United States Government Department of Justice, 2015; 2019). A special case will be repeated offenders who might expect to receive harsher treatment who have a higher chance of their banking license to be revoked (Koester & Pester, 2017; The United States Government Department of Justice, 2019b).

Interestingly, it does not matter for the U.S. authorities where the bank that breaches the U.S. sanction resides, it does not have to conduct any business in the United States at all (The United States Government Department of Justice,

2019b). The reason for this is that any bank that uses the U.S. dollar to do business with the sanctioned entities are in fact subject to U.S. jurisdiction (Emmenegger, 2015). In this regard, the authorities might realistically threaten to exclude an international bank from this system. Finally, the U.S. authorities might seek to transfer the funds from penalties to those who might have been negatively affected by the misconduct of the banks and the conduct of the sanctioned regimes (The United States Government Department of Justice, 2015; 2015b; 2018), e. g. the United States Victims of State Sponsored Terrorism Fund.

What is relevant to mention from the perspective of banks and their behavior? First and foremost, it is vital to mention that banks might process millions to billions of dollars for sanctioned entities as they consider it to be a profitable business opportunity (The United States Government Department of Justice, 2015; Gilchrist, 2014). Furthermore, banks might commit the crimes over multiple years (as much as for almost 10 years) with the full knowledge of the senior management and the wide one throughout the organization, despite some internal opposition to such policies and raising of figurative red flags by employees (The United States Government Department of Justice, 2015; 2015c; 2018; 2019). It is also crucial to mention that the breach of economic sanctions is not about lone transactions that would be stopped immediately. Rather than that, there can be thousands of them (2,500

to 9,500 transactions) as banks actively disguise their true nature, e. g. by addressing the sanctioned counterparties “*not to mention Iran*” (Gilchrist, 2014; The United States Government Department of Justice, 2018; 2019b). The willfulness of banks is also demonstrated by the fact that they might have formalized policies to deal with sanctioned entities (The United States Government Department of Justice, 2019). To make matters even worse, some banks might also conduct money laundering on top of the economic sanction violations (The United States Government Department of Justice, 2012).

In terms of the investigation, banks might opt not to fully cooperate with the law enforcement and regulators, or they might, arguably leading to some reduction of the punishment (The United States Government Department of Justice, 2015; 2015c; 2019b). In the resulting decision by the authorities, banks might be sentenced to probation – i.e. to be fully prosecuted if they do not comply with the deal devised by the authorities (The United States Government Department of Justice, 2012; 2015). The probation can take up to 3 or even 5 years (The United States Government Department of Justice, 2015b; 2018). In parallel to the criminal investigation of the bank, similar litigation can occur also with individual employees (The United States Government Department of Justice, 2019b). In this regard, banks might decide to get rid of employees who bear responsibility for the misconduct, even chief officers and other senior executives, or might take back already paid bonuses to senior compliance officers as well as to reduce bonuses to senior managers during the probation time (The United States Government Department of Justice, 2012; 2015). In terms of corporate governance practices, banks might be forced to implement remedial measures as for compliance and AML rules – possibly with an external consultancy help – so that the misconduct cannot happen again (The United States Government Department of Justice, 2012; 2015b; 2015c). Also, the senior management in compliance might be clearly designated to be accountable for sanctions-related internal controls (The United States Government Department of Justice, 2012; 2018) and the bank itself might agree on additional disclosure and cooperation with regulators (The United States Government Department of Justice, 2015b; 2019b).

Finally, as of the first half of 2022, the U.S. still uses economic sanctions against Iran, Sudan or Cuba. However, the biggest incremental step of the year was a rapid escalation of economic sanctions against Russia as a reaction to its aggression of Ukraine in February 2022 (Funakoshi et al., 2022). Starting on February 24, the U.S. imposed sanctions on the chief executive of Sberbank. More importantly, on February 27, the access of some Russian banks to the SWIFT payment system, and then on February 28, the U.S. banned transactions with the Russian central bank, Ministry of Finance as well as the National Wealth Fund (Bown, 2022). Further sanctions concerning Sberbank and Alfa Bank were initiated on March 24 and April 6. Finally, on April 20, the U.S. Treasury announced that it was sanctioning companies and individuals which attempted to circumvent the current U.S. sanctions against Russia (The United States Government Department of the Treasury, 2022). This clearly shows that there is a “market” for facilitating evasion of these severe restrictions.

The crucial question – however speculative it might appear – if this opportunity will be provided by banks or not. On the one hand, it is true that several international banks – some of which were punished by U.S. authorities for violations of economic sanctions – have had their operations in Russia for a long time. This list of banks includes institutions such as UniCredit, HSBC, Deutsche Bank, Citibank, Nordea Bank, Raiffeisen Bank or Banca Intesa. On the other hand, some banks already announced that they leave Russia (as done by Société Générale on April 11), wind down their operations (HSBC on February 28; Citibank on March 14) or conduct an urgent review of the business with an option to leave Russia (as announced by UniCredit on March 15; Funakoshi et al., 2022).

Overall, the theoretical basis for the topic enables a study of economic sanctions as well derivation of a rule about what should determine the level of penalties to banks by regulatory or enforcement agencies. Finally, a discussion about which steps authorities might want to conduct to prevent or punish misconduct effectively is warranted.

2. RESULTS

2.1. Assumptions of the theoretical model for bank penalties due to economic sanction violations

The framework examining motives of banks to misbehave and those of a regulator to disincentivize such illegal conduct is inspired by the model of Savage (1954) as well as that on efficiency wages by Shapiro and Stiglitz (1984)². In particular, this model allows to determine the optimal level of a penalty based on characteristics of both the banking sector and preferences of the regulator. Consequently, a use of a penalty allows the regulator to deter potential moral hazard behavior of banks, such as their incentive to violate economic sanctions.

The proposed model is based on some fundamental assumptions. Following standard consumer theory, a representative subject – a bank in our case – aims to maximize its own utility and a violation of economic sanction is considered to be profitable – as was shown based on actual evidence in the Introduction. Next, information is considered to be asymmetrically distributed between different agents of the system. Third, a bank knows that a regulator is not omnipotent, and that violation of economic sanction is profitable. Therefore, it is assumed that the bank has to ‘hold back’ as not to violate economic sanctions and it bears compliance costs, denoted as e , that are not easily measurable for the regulator. Finally, it is assumed that the regulator is not able to examine the banks without any cost and will generally perform sample checks as a more cost-effective alternative. All in all, a variation of a classic moral hazard problem is considered (Rowell & Connelly, 2012).

To establish the model algebraically, let P denote the penalty for violation of economic sanctions, where $P \geq 0$, F be the amount of the illegally processed funds and A be the aggregate total percentage reward on “investment” that is not in accord with economic sanctions. Then the regulator could persuade the bank not to violate economic

sanctions – either by disincentivizing repeated offences or by setting a deterring example for other banks – by calibrating the penalty P at a level higher than the product of A and F . Furthermore, let γ , with $0 \leq \gamma \leq 1$, be the probability of detecting that a bank has violated economic sanctions (by a regulator). Then the model stipulates two situations given as:

$$\begin{aligned} e &= 0, & \text{if the bank is non-compliant,} \\ e &= \bar{e}, & \text{if the bank complies.} \end{aligned} \quad (1)$$

As for the setup of the banking sector, there are n homogeneous banks in the system, the number of banks that are non-compliant is n_c and each bank tries to optimize its utility function:

$$U = -(AF + \bar{e}), \quad (2)$$

where risk neutrality and unitary dis-utility of effort are assumed.

2.2. Deriving the optimal level of penalty

The utility of a bank that is non-compliant can be expressed as a weighted average of two outcomes. On the one hand, it might avoid detection with probability $(1 - \gamma)$ which would result in obtaining the percentage reward A on the amount of money F illegally invested, violating economic sanctions. On the other hand, a bank can be detected with probability γ , meaning that it could face disutility corresponding to the penalty P based on the share of the banks that are compliant $[(n - n_c) / n]$ as the regulator aims to maintain discipline in the sector under its supervision. Finally, the total utility for a non-compliant bank can be expressed as:

$$U^n = (1 - \gamma)AF + \gamma(-P) \left[\frac{n - n_c}{n} \right]. \quad (3)$$

For a given value of the probability to be detected γ , a bank will choose to comply or not just with respect to the amount of a penalty that is captured by P . The banks might get an idea about a potential value of a penalty based on the previous punish-

² The Shapiro-Stiglitz model looks at typical consequences of asymmetric information in the principal-agent's models. It uses wage as an instrument with which the firm (the principal) avoids moral hazard behaviour of the employees (the agents). As with all models of this type, employees' wages play an important role, by increasing wages, firms can get higher quality work and may influence individuals' motivations and thus effort.

ments they faced or based on evidence concerning their competitors. However, a bank will not get involved in an illegal activity and will sacrifice compliance costs $e = \bar{e}$ only if it obtains higher utility in case of the compliance. To ensure that, it is up to the regulator to set the penalty P in such a way that it leads to the situation when $U^n \leq U$. If this is satisfied, the regulator essentially obtains the effort \bar{e} from the bank and maximizes the efficiency of the system. Algebraically, P should be calibrated at a level that makes it preferable for a bank to comply, thus:

$$(1-\gamma)AF + \gamma(-P) \left[\frac{n-n_c}{n} \right] \leq -AF - \bar{e}. \quad (4)$$

As a result, we obtain the optimal level of P as:

$$P^* = \left[AF \left(\frac{2}{\gamma} - 1 \right) + \frac{\xi}{\gamma} \right] \left[\frac{n}{n-n_c} \right], \quad (5)$$

with the conditions:

$$\frac{\partial P^*}{\partial A} > 0, \quad \frac{\partial P^*}{\partial F} > 0, \quad \frac{\partial P^*}{\partial \gamma} < 0. \quad (6)$$

To the maximize the total efficiency of the system, the inequality in (5) has to be shown as a strict equality. Then, the relationship between the bank's costs \bar{e} to comply and the level of penalty P can be expressed in a dichotomous way:

$$e=0, \text{ for } P < \left[AF \left(\frac{2}{\gamma} - 1 \right) + \frac{\bar{e}}{\gamma} \right] \left[\frac{n}{n-n_c} \right], \quad (7)$$

$$e=\bar{e}, \text{ for } P \geq \left[AF \left(\frac{2}{\gamma} - 1 \right) + \frac{\bar{e}}{\gamma} \right] \left[\frac{n}{n-n_c} \right].$$

In other words, for a sufficiently low level of penalty P , a bank decides to produce no effort to comply ($e = 0$), and it violates the present economic sanctions. Alternatively, it can decide to comply by sacrificing the costs equal to the level $e = \bar{e}$. Crucially, the choice of the bank depends on the ability of the regulator to detect banks' transgressions as captured by the value of the probability γ .

2.3. The equilibrium of the model

Now, discarding the possibility of a partial equilibrium, one can suppose that also other banks in

the system may be deciding whether to transgress economic sanctions and that the rule to derive the optimal penalty is the same for all of them. Hence, by rewriting the inequality (5), the optimal level of a potential penalty for any bank becomes:

$$P^* = \left[AF \left(\frac{2}{\gamma} - 1 \right) + \frac{\xi}{\gamma} \right] \left[\frac{n}{n-n_c} \right]. \quad (8)$$

The functional relationship of P^* in $[n / (n - n_c)]$ can be illustrated in a Cartesian plane ($n_c; P$) and (8) can be considered as a 'supply curve'. It has a positive slope as with larger values of n_c (the number of non-compliant banks), the value of P^* will also increase. As for the limit points of this curve, it is useful to realize that if each bank in the system does not comply ($n_c = n$), then:

$$\left[\frac{n}{n-n_c} \right] \rightarrow \infty, \quad (9)$$

and also $P^* \rightarrow \infty$. This means that in case of a complete breakdown of the regulator's authority and a widespread violation of economic sanctions in the system, there is no finite level of a penalty that could enforce banks to comply again. In a similar fashion, if all banks comply ($n_c = 0$), the optimal level of the penalty, as well as the intercept of the 'supply curve', is given by:

$$\left[AF \left(\frac{2}{\gamma} - 1 \right) + \frac{\xi}{\gamma} \right]. \quad (10)$$

Finally, we can conclude with Figure 7 that depicts the 'supply curve' of the model. It can be also shown that with a lower chance to detect violation of economic sanctions ($\gamma_1 < \gamma_0$) – and thus greater information asymmetry – the regulator should maintain the level of the penalty relatively higher to stimulate the banks to comply.

The model can be developed further by establishing an equilibrium condition for the entire banking sector. This means finding an 'optimal' number of banks that are non-compliant such that the total efficiency of the system will be at its maximum. The model assumes a realistic hypothesis that there will always be some banks that are non-compliant as there is information asymmetry and the regulator cannot detect every violation of economic sanctions.

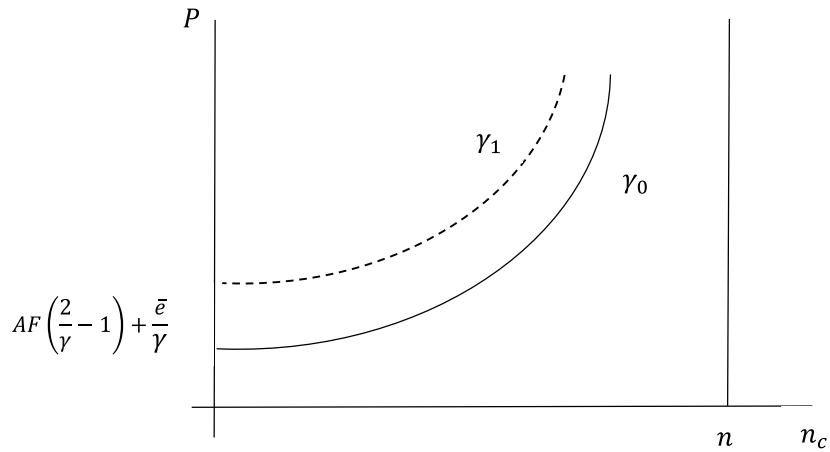


Figure 7. The curve showing the optimal level of a penalty

To find the equilibrium, we define a ‘demand curve’ for banks that are non-compliant. It is given by the condition of maximum profits as it can be assumed that the profit for the system is equal to its total efficiency. Then, the total efficiency π can be written as a difference between benefits and costs:

$$\pi = f[\bar{e}(n - n_c)] - (P^* \cdot n_c). \quad (11)$$

To corroborate, the benefits of the system can be expressed as a function of the number of the banks $(n - n_c)$ that do not violate economic sanctions and the level of compliance costs \bar{e} sacrificed by each of them. The costs for the system correspond to the level of the penalty P for each of n_c banks violating the economic sanctions. Assuming that $e = \bar{e} > 0$, (11) represents the optimization problem for the

regulator. The solution that guarantees the maximum total efficiency of the banking sector can be derived from:

$$\frac{\partial \pi}{\partial n_c} = 0, \quad (12)$$

and will be generally of the following form:

$$P^* = -f'[\bar{e}^2(n - n_c)]. \quad (13)$$

Furthermore, for each $n > n_c$, it holds that:

$$f'(n) < f'(n_c). \quad (14)$$

Hence, it can be concluded that the value P^* indicated on the P -axis of Figure 8 is always a positive number for the ‘demand curve’. Also, Figure 8 shows the general equilibrium in the banking sector.

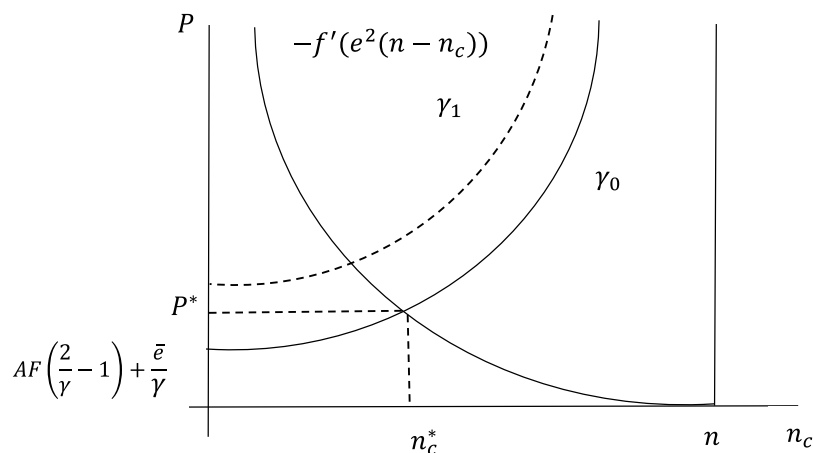


Figure 8. The equilibrium in the banking sector

3. DISCUSSION

3.1. Economic significance of the model's results and comparison with other seminal banking models on penalties

It is crucial to emphasize that the relationship between the optimal level of penalty P^* and the probability γ to detect a bank's transgression is negative – as can be seen also in (5) that shows an inverse relationship between these two variables. From an economic point of view, this means that if the probability of a detection by the regulator is low, then it will be harder to persuade banks to comply. This also implies that the optimal penalty shall be set at a comparatively higher level. Next, a positive change in the percentage reward A or the volume of the illicit investment F leads to a change in P^* in the same direction. That means that a more profitable activity or that of a larger scope should be punished more. This result also has a direct relevance for regulatory and enforcement authorities.

Furthermore, as for the optimization of the total efficiency of the banking sector implies that for a given probability of detection γ and given the parameters of the banks' business venture A and F that violates economic sanctions, the regulator will choose such a level of penalty P^* that minimizes the number of non-compliant banks n_c for any level of compliance costs \bar{e} that banks decide to sacrifice. This again suggests that policymakers should be strict and decisive in their response to misconduct. Some of these policy options are discussed below in Policy implications and an indication of future prospects.

Although there are no directly comparable models exploring the reaction of regulatory or enforcement authorities and consequential sanction infringement penalties can be argued that our model falls in line with several seminal banking models from the past. First, the idea that decision-making can be rationally de-

scribed by knowledge based on the experience of the individual concerned was first discussed by Ramsay (2016)³. In addition, Savage (1954) describes a model of decision-making in differing subjective contexts of risk in his theory of "Subjective Expected Utility". This theory is moreover directly relevant to the behavior of an individual deciding whether to infringe sanctions for an amount of illicit profit in differing scenarios of risk discovery. In case of doing so, the net benefit must be clearly larger than the penalties possible multiplied by the probability of those penalties occurring (usually based on the discovery of transgressions)⁴. The rational basis for the decision-making of so-called "rule-breakers" who may defy sanctions legislation is discussed in Becker (1968). This outlines in particular the effects of differing probabilities for punishment for offences on the economic "viability" of such activities. Furthermore, Yokoyama and Takahashi (2013) develop a model of risk-reward behavior and demonstrate the distortions of over- and under-weighting of perceived punishment severity at both very low and high probabilities of discovery.

3.2. Policy implications and an indication of future prospects

In terms of policy implications, there can be several ways which might improve effectiveness of regulation which would in turn lower the probability of a future penalty for banks' assistance to rogue nations. Broadly speaking, three groups of measures can be distinguished – preventive, those aimed to increase the probability of detection of a misconduct, and exemplary ones after the misconduct occurred.

As for preventive measures, there is clearly a need for high-quality corporate governance practices that would, nevertheless, not lead to overly expensive internal control systems (Haslem, 2005; Flore et al., 2021). This requirement should be clearly communicated by supervisory authorities which should offer banks a platform for a dialogue that would reflect previous experience

³ Note that this is a reprint of the original paper from 1920s that cannot be publicly accessed.

⁴ The model was later amended in cases of ambiguity by Ellsberg (1961).

with misconduct from the banking industry. As well, it can be argued that a preventive measure worth exploring is to limit the size of banks, especially those with global operations – thus discarding the “Too Big to Jail” notion. This is based on evidence that smaller banks are easier to punish and less likely to misbehave repeatedly (Gilchrist, 2014). The breaking up of big banks would also increase the bargaining power of regulators over banks as the latter could not argue that a punishment would affect innocent parties such as depositors. Similarly, concerns about stability of financial sectors or the world economy might lessen in case of limiting banks’ size, alleviating the too big to fail issue. Finally, it should also be mentioned that The United States Government Department of Justice (DoJ) has pursued a clear strategy regarding banks’ misconduct in the last decade that might also be seen as preventive in its nature. At first, the DoJ informs the public that a bank is investigated but that it will remain in business which is clear to manage market expectations and prevent panic situations (Emmenegger, 2015). While it is true that the DoJ could initiate a criminal investigation that might even lead to a revocation of the bank’s license, it might be inclined to save this ‘nuclear’ option for the most severe cases only – e.g. when a bank does not cooperate with an investigation, such as described in The United States Government Department of Justice (2015). The reason for such a strategy is that a criminal investigation of a bank could lead to an effective ostracization of this offender from the U.S. interbank market which could in turn destabilize not only the criminal bank but the entire sector (Emmenegger, 2015). Thus, rather than punishing a bank in a drastic way and then saving it later from taxpayers’ money when it becomes illiquid, a more sensible option – that has been indeed preferred in practice – is to avoid criminal investigations and close the case with a punitive penalty.

Second, to increase the chance to detect actual misconduct, regulators or lawmakers might be inclined to increase rewards for whistleblowing to also include those that took part in the misconduct (Pacella, 2014). While this might seem morally dubious, there is arguably quite a large

benefit for the society at play as penalties can alleviate the harm caused by the misconduct of a potentially systematically important corporation. As for other means, to obtain information about misconduct, it also might be mentioned a potential usefulness of big data techniques (Jagtiani et al., 2018; Guerra et al., 2022). While they cannot be seen as a direct substitute for on-site inspections of financial institutions, they might well decrease costs of supervisory conduct as well as bank compliance. As an example, a banking book that is secure but able to be checked remotely could be a viable solution. Finally, supervisors might like to prefer more frequent visits to banks over a less frequent but very thorough inspections. This might be especially relevant to discourage repeated offences (Marchionne et al., 2021). On the other hand, it is true that more frequent inspections might result in a perception of higher compliance costs by banks which might – in the spirit of the model presented in Theoretical basis of this paper – strengthen incentives to operate covertly outside the inspection system.

In terms of policy after misconduct occurred and was identified, regulators should consider the option of restricting the opportunities to deduct the penalty from pre-tax income (Koester & Pelster, 2017). If enacted, such a measure might embolden shareholders of banks to require no tolerance to misconduct that might lead to penalties. Furthermore, regulators might think about punishing offenders that end up paying penalties for different types of misconduct more harshly. While it is true that banks are targeted more harshly after repeating the same offence (see e.g. The United States Government Department of Justice, 2019b), a new policy could e.g. announce that a certain number of offences in different areas will lead to a similarly harsh treatment as in case of repeated misconduct of the same kind. Last but not least, it can be argued that criminal prosecution of individuals instead of institutions should be pursued more frequently (Gilchrist, 2014; Wall, 2020). Ideally, such a policy would restrict the illicit activity of banks without stopping their normal business. While it is true that prosecuting crimes of individuals from the banking industry

is notoriously difficult⁵, a lack of targeted punishment hardly discourages other employees in executing business that is clearly profitable for their employer. Arguably, there are several ways how to hold even most senior executives accountable for their reckless behavior. Regulators can introduce a policy that would mean that individuals responsible for misconduct would lose income or bonuses as a compensation of prior unjust enrichment. Alternatively, regulators can punish individuals with a ban from the banking industry for life in case of personal dishonesty (Gilchrist, 2014).

Finally, it can be concluded that as for avenues for further research, a model that would incorporate several of the aforementioned potential policy responses can be mentioned. Such a model would apart from stating the rule for a derivation of the optimal level of penalty also offer a more nuanced reaction of policymakers to banks' misconduct. Also, this topic would warrant another ex-post examination if banks indeed decided to breach economic sanction towards Russia and what was the reaction of relevant authorities.

CONCLUSION

The main purpose of this study was to explore banks' motives to pursue violation of economic sanctions that might result in a penalty levied by a regulator. Also, to formulate adequate policy implications for potential future cases of breaches of economic sanction by banks in connection to the current situation with Russia. The equilibrium of the model, i.e. the obtained result, is given both by banks' characteristics such as the compliance costs or the profitability of the illegal venture as well as the effectiveness of the regulator in detection of misbehaving banks. All in all, the model suggests a system where some of the banks do not comply, and that might be also the reason why regulators should keep doing their work based on previous experience with banks' misconduct, not only regarding potential violations of economic sanctions. And to ensure solid effectiveness of their actions, regulators and enforcement agencies might think about a variety of policy ways that could diminish the probability that the actual misconduct will occur again as reviewed by this paper.

AUTHOR CONTRIBUTIONS

Conceptualization: Václav Brož, Domenico Pace, Stefano Cavagnetto.

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Funding acquisition: Stefano Cavagnetto.

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Validation: Bruce Gahir.

Visualization: Václav Brož, Domenico Pace, Thomas Draper.

Writing – original draft: Václav Brož, Domenico Pace.

Writing – reviewing & editing: Václav Brož, Bruce Gahir, Thomas Draper, Stefano Cavagnetto.

5 Despite the fact that the so-called Senior Managers & Certification Regime used in the United States or the United Kingdom produces a detailed map of who is responsible for what in an organisation and could form the basis for individualisation of potential punishments.

REFERENCES

1. Becker, G. S. (1968). Crime and Punishment: An Economic Approach. In N. G. Fielding, A. Clarke & R. Witt (Eds), *The Economic Dimensions of Crime* (pp. 169-217). London: Palgrave Macmillan. Retrieved from <https://www.jstor.org/stable/1830482>
2. Bown, C. P. (2022). *Russia's war on Ukraine: A sanctions timeline*. Retrieved from <https://www.piie.com/blogs/realtime-economic-issues-watch/russias-war-ukraine-sanctions-timeline>
3. Brož, V., & Kočenda, E. (2022). Mortgage-related bank penalties and systemic risk among US banks. *Journal of International Money and Finance*, 122, 102575. <https://doi.org/10.1016/j.jimonfin.2021.102575>
4. De Batz, L., & Kočenda, E. (2020). *Financial Crime and Punishment: A Meta-Analysis* (IES Working Paper No. 2020/40). Charles University Prague, Institute of Economic Studies. Retrieved from <https://ies.fsv.cuni.cz/sci/publication/show/id/6299/lang/cs>
5. Ellsberg, D. (1961). Risk, ambiguity, and the Savage axioms. *The Quarterly Journal of Economics*, 75(4), 643-669. <https://doi.org/10.2307/1884324>
6. Emmenegger, P. (2015). The long arm of justice: US structural power and international banking. *Business and Politics*, 17(3), 473-493. <https://doi.org/10.1515/bap-2014-0046>
7. European Central Bank. (2016). *Financial Stability Review* (May 2016). Retrieved from <https://www.ecb.europa.eu/pub/pdf/fsr/financialstabilityreview201605.en.pdf>
8. Financial Times. (2015). *Bank fines: get the data*. Retrieved from <http://ig-legacy.ft.com/content/e7fe9f25-542b-369f-83b2-5e67c-8fa3dbf>
9. Fiordelisi, F., Soana, M. G., & Schwizer, P. (2014). Reputational losses and operational risk in banking. *The European Journal of Finance*, 20(2), 105-124. <https://doi.org/10.1080/1351847X.2012.684218>
10. Flore, C., Degryse, H., Kolaric, S., & Schiereck, D. (2021). Forgive me all my sins: How penalties imposed on banks travel through markets. *Journal of Corporate Finance*, 68, 101912. <https://doi.org/10.1016/j.jcorpfin.2021.101912>
11. Funakoshi, M., Lawson, H., & Deka, K. (2022). *Tracking sanctions against Russia*. Reuters. Retrieved from <https://www.reuters.com/graphics/UKRAINE-CRISIS/SANCTIONS/byvrjen-zmve/>
12. Garrett, B. L. (2014). *Too big to jail*. Cambridge: Harvard University Press.
13. Garrett, B. L. (2016). The rise of bank prosecutions. *Yale Law Journal Forum*, 126, 33. Retrieved from <https://www.yalelawjournal.org/forum/the-rise-of-bank-prosecutions>
14. Gilchrist, G. M. (2014). The special problem of banks and crime. *University of Colorado Law Review*, 85, 1-52. Retrieved from http://lawreview.colorado.edu/wp-content/uploads/2014/01/8.-85.1-Gilchrist_Final_Web.pdf
15. Good Jobs First. (2022). *Violation Tracker*. Retrieved from <https://www.goodjobsfirst.org/violation-tracker>
16. Guerra, P., Castelli, M., & Côte-Real, N. (2022). Approaching European Supervisory Risk Assessment with SupTech: A Proposal of an Early Warning System. *Risks*, 10(4), 71. <https://doi.org/10.3390/risks10040071>
17. Haslem, B. (2005). Managerial opportunism during corporate litigation. *The Journal of Finance*, 60(4), 2013-2041. <https://doi.org/10.1111/j.1540-6261.2005.00786.x>
18. Jagtiani, J., Vermilyea, T., & Wall, L. D. (2018). The roles of big data and machine learning in bank supervision. *Forthcoming, Banking Perspectives*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3221309
19. Karpoff, J. M., & Lott Jr, J. R. (1993). The reputational penalty firms bear from committing criminal fraud. *The Journal of Law and Economics*, 36(2), 757-802. <https://doi.org/10.1086/467297>
20. Knell, M., & Stix, H. (2015). Trust in banks during normal and crisis times—evidence from survey data. *Economica*, 82, 995-1020. <https://doi.org/10.1111/ecca.12162>
21. Koester, H., & Pelster, M. (2017). Financial penalties and bank performance. *Journal of Banking & Finance*, 79, 57-73. <https://doi.org/10.1016/j.jbankfin.2017.02.009>
22. Koester, H., & Pelster, M. (2018). Financial penalties and banks' systemic risk. *The Journal of Risk Finance*, 19(2). <https://doi.org/10.1108/JRF-04-2017-0069>
23. Marchionne, F., Fratianni, M., Giri, F., & Papi, L. (2021). Frequency vs. Size of Bank Fines in Local Credit Markets. *Italian Economic Journal*, 8, 549-583. <https://doi.org/10.1007/s40797-021-00161-4>
24. Murphy, D., Shrieves, R., & Tibbs, S. (2009). Understanding the Penalties Associated with Corporate Misconduct: An Empirical Examination of Earnings and Risk. *Journal of Financial and Quantitative Analysis*, 44(1), 55-83. <https://doi.org/10.1017/S0022109009090036>
25. Pacella, J. M. (2014). Bounties for bad behavior: rewarding culpable whistleblowers under the Dodd-Frank act and Internal Revenue Code. *University of Pennsylvania Journal of Business Law*, 17(2), 345. Retrieved from <https://scholarship.law.upenn.edu/jbl/vol17/iss2/1>
26. Ramsey, F. P. (2016). Truth and Probability. In H. Arló-Costa, V. Hendricks & J. van Benthem (Eds.), *Readings in Formal Epistemology* (pp. 21-45). Cham: Springer. https://doi.org/10.1007/978-3-319-20451-2_3

27. Rowell, D., & Connelly, L. B. (2012). A history of the term "moral hazard". *Journal of Risk and Insurance*, 79(4), 1051-1075. <https://doi.org/10.1111/j.1539-6975.2011.01448.x>
28. Savage, L. J. (1954). *The Foundations of Statistics*. New York: Wiley.
29. Shapiro, C., & Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *The American Economic Review*, 74(3), 433-444. Retrieved from <http://www.jstor.org/stable/1804018>
30. The United States Government Department of Justice. (2012). *HSBC Holdings Plc. and HSBC Bank USA N.A. Admit to Anti-Money Laundering and Sanctions Violations, Forfeit \$1.256 Billion in Deferred Prosecution Agreement*. Retrieved from <https://www.justice.gov/opa/pr/hsbc-holdings-plc-and-hsbc-bank-usa-na-admit-anti-money-laundering-and-sanctions-violations>
31. The United States Government Department of Justice. (2015). *BNP Paribas Sentenced for Conspiring to Violate the International Emergency Economic Powers Act and the Trading with the Enemy Act*. Retrieved from <https://www.justice.gov/opa/pr/bnp-paribas-sentenced-conspiring-violate-international-emergency-economic-powers-act-and>
32. The United States Government Department of Justice. (2015b). *Commerzbank AG Admits to Sanctions and Bank Secrecy Violations, Agrees to Forfeit \$563 Million and Pay \$79 Million Fine*. Retrieved from <https://www.justice.gov/opa/pr/commerzbank-ag-admits-sanctions-and-bank-secrecy-violations-agrees-forfeit-563-million-and>
33. The United States Government Department of Justice. (2015c). *Crédit Agricole Corporate and Investment Bank Admits to Sanctions Violations, Agrees to Forfeit \$312 Million*. Retrieved from <https://www.justice.gov/usao-dc/pr/cr-dit-agricole-corporate-and-investment-bank-admits-sanctions-violations-agrees-forfeit>
34. The United States Government Department of Justice. (2018). *Manhattan U.S. Attorney Announces Criminal Charges Against Société Générale S.A. For Violations of The Trading With The Enemy Act*. Retrieved from <https://www.justice.gov/usao-sdny/pr/manhattan-us-attorney-announces-criminal-charges-against-soci-t-g-n-rale-sa-violations>
35. The United States Government Department of Justice. (2019). *UniCredit Bank AG Agrees to Plead Guilty for Illegally Processing Transactions in Violation of Iranian Sanctions*. Retrieved from <https://www.justice.gov/opa/pr/unicredit-bank-ag-agrees-plead-guilty-illegally-processing-transactions-violation-iranian>
36. The United States Government Department of Justice. (2019b). *Standard Chartered Bank Admits to Illegally Processing Transactions in Violation of Iranian Sanctions and Agrees to Pay More Than \$1 Billion*. Retrieved from <https://www.justice.gov/opa/pr/standard-chartered-bank-admits-illegally-processing-transactions-violation-iranian-sanctions>
37. The United States Government Department of the Treasury. (2022). *U.S. Treasury Designates Facilitators of Russian Sanctions Evasion*. Retrieved from <https://home.treasury.gov/news/press-releases/jy0731>
38. Wall, L. D. (2020). Is stricter regulation of incentive compensation the missing piece? *Journal of Banking Regulation*, 21(1), 82-94. <https://doi.org/10.1057/s41261-019-00119-8>
39. Yokoyama, T., & Takahashi, T. (2013). Mathematical Neurolaw of Crime and Punishment: The q-Exponential Punishment Function. *Applied Mathematics*, 4(10), 1371-1375. <https://doi.org/10.4236/am.2013.410185>