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The future of financial fraud

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Abstract

Is financial fraud becoming a bigger or smaller problem over time? Current empirical approaches to this question generate mixed inferences. As an alternative, I use two theoretical constructs that isolate several factors that motivate fraud, and use them to consider the impact of technological and wealth changes over time. Some changes, such as an increase in anonymity in some financial transactions, facilitate new fraud innovations and increase the possibility of fraud. The COVID-19 pandemic and resulting economic shutdown has fostered major disruptions in relative demands and organizational capital that also increase the likelihood of fraud over the next few years. Viewed over a longer time scale, however, the majority of technological and wealth changes seem likely to increase the use and effectiveness of reputational capital, third-party enforcement, and ethical motivations as fraud deterrents. I predict that, on net, these changes will drive a long-term decrease in the incidence of fraud.

JEL classifications: A13, G38, K40, Z10
Keywords: Financial misconduct, fraud, trust, reputation

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The future of financial fraud

1. Introduction

Is financial fraud becoming a bigger or smaller problem over time? The available evidence is mixed, with some indicators increasing and others decreasing or flat. Figure 1, for example, shows the number of new SEC enforcement actions targeting publicly traded firms for financial misrepresentation from 1978 through early 2020. The number trends up through 2003 before turning flat or slightly downward. Figure 1 also reports an alternative measure, the number of firms (among those facing enforcement action) actually violating financial reporting rules in any given year. Using this measure, fraud activity has decreased since the early 2000s. A third measure, the annual number of securities-related class action lawsuit filings that allege financial misconduct, suggests that fraud has increased in recent years. Cornerstone Research (2020, p. 1) reports that, "Plaintiffs filed 428 new class action securities cases … across federal and state courts in 2019, the most on record and nearly double the 1997–2018 average."

SEC actions and securities lawsuits could trend differently if they act as enforcement substitutes. Or perhaps each isolates a different aspect of enforcement. Regardless, these counts are not reliable indicators of trends in fraud because they omit frauds that occur but never trigger a regulatory enforcement action or lawsuit. We could track other indicators of financial misconduct such as restatements. But this would not resolve the observability problem. Many restatements have little to do with misconduct, and many actual instances of misconduct do not trigger restatements.[1] To address the problem of unobserved misconduct, some researchers have attempted to measure the probability of detection and the prevalence of unobserved fraud.[2] These approaches hold promise, but have not been extended to assess time series trends in fraud.

[1] For details, see Hennes, Leone, and Miller (2008) and Karpoff, Koester, Lee, and Martin (2017).
[2] See, for examples, Beneish (1999), Cecchini, Aytug, Koehler, and Pathak (2010), Dechow, Ge, Larson, and Sloan (2011), Amiram, Bozanic, and Rouen (2015), and Alawadhi, Karpoff, Koski, and Martin (2020).

This paper approaches the question in a different way. Rather than examining data, I draw from theory to examine how the incidence of financial misconduct is likely to change over time. I draw from two theoretical constructs that characterize the forces that prompt firms to commit fraud, and use them to examine the effects of two broad forces that shape many secular trends – technology and wealth. The first construct is the Trust Triangle, which Dupont and Karpoff (2020) use to describe the forces that discipline misconduct and encourage the building of trust that is at the core of most economic transactions. The second construct is Klein and Leffler's (1981) model of contractual enforcement in the absence of third-party enforcement. These models add content to Becker's (1968) basic proposition that a person will commit fraud when the expected benefits exceed the expected costs, by partitioning the costs into first-party, related-party, and third-party mechanisms. I use these two constructs to infer that some changes in wealth and technology – say, the anonymity afforded by some blockchain applications – will lower the cost and increase the profitability of fraud. Most changes, however, are likely to increase the use and effectiveness of first-party, related-party, and third-party fraud enforcement and deterrence. Viewed over a longer horizon – say ten or more years – the net effect of these changes should be a decrease in fraud over time.

To be sure, such a happy conclusion comes with qualifications. In Section 6, I consider several forces that could disrupt a long-term trend toward less fraud. Most prominently, the COVID-19 pandemic and resulting economic shutdown have disrupted relative demands and devastated organizational capital throughout the world economy – changes that provide fertile ground for frauds of all types, including financial fraud. Informational frictions, behavioral biases, loss of trust in institutions, and income inequality also could increase over time, disrupting a long-term trend toward less fraud. Despite such dangers, and despite a likely short-term increase in fraud associated with the COVID-19 pandemic and associated economic and political turmoil, I argue that the long-term trend is toward less fraud. Stated differently, honest dealing is an income normal good, and demand for it will increase with long-term economic growth.

Before proceeding, I should note that the term "fraud" has many connotations. As Amiram et al. (2018) point out, a useful umbrella term that includes most types of illegal and unethical financial reporting behavior is "financial misconduct."[3] Violations of the SEC's reporting rules that violate section 13(a) of the Securities and Exchange Act of 1934 – e.g., delayed filings – can be called "financial misreporting," while 13(b) violations (as reported in Figure 1) are about "financial misrepresentation." Such violations frequently, but not always, also include allegations of fraud, e.g., violations of Section 17a of the 1933 Securities Act or Section 10(b)-5 of the 1934 Securities Exchange Act. (All securities class action lawsuits that cite violations of Section 10(b)-5 involved allegations of fraud.) Mindful of such distinctions, I nonetheless use the term "fraud" in its colloquial sense, as a "wrongful or criminal deception intended to result in financial or personal gain" (from Google dictionary), and use the term interchangeably with "cheating," "misconduct," and "opportunism." My focus is on conduct that violates explicit or implicit agreements between parties to an economic transaction, whether or not the conduct meets a legal definition of fraud.

2. Construct #1: The Trust Triangle

Figure 2 illustrates the Trust Triangle, which Dupont and Karpoff (2020) use to describe the forces that encourage people to overcome the risks of opportunism and to engage in mutually beneficial economic exchange.[4] Voluntary exchange and production activities are powerful engines of economic growth and social well-being. But for markets to work, counterparties must trust each other, at least enough to facilitate their transactions. The central importance of trust is a feature of many economic models. In Akerlof's (1970) lemons problem, for example, informational asymmetries create informational disadvantages and cause buyers and sellers to

[3] This nomenclature emphasizes financial reporting misconduct. By comparison, Cumming, Dannhauser, and Johan (2015) survey research on financial market misconduct, which includes insider trading, price and volume manipulation, spoofing, false disclosure of trades or market information, and broker-agency conflicts.

[4] Parts of this section draw from Dupont and Karpoff's (2020) Section 2.

mistrust each other. Buyers mistrust sellers, who know more about the quality of the product they are selling, and sellers mistrust buyers, who know more about their willingness and ability to hold up their end of the deal. In the theoretical extreme, no one is willing to trade except for the lowest quality goods and services. The potential lemons problem is particularly acute in the modern corporation, as buyers of financial claims – stockholders and bondholders – face not only extreme informational disadvantages, but also moral hazard and agency problems when their investments are managed by other people, i.e., the firm's managers. This observation lies at the heart of modern theories of the firm and corporate governance (e.g., Alchian and Demsetz (1972).

Despite the risk of opportunism and fraud – both in everyday transactions such as buying food and in financial transactions involving large companies – buyers and sellers do get together, frequently. As Dupont and Karpoff (2020) observe, "Viewed in light of the lemons problem, the observation that billions of trades occur *every day in all parts* of the world is nothing short of a miracle. Counterparty risk is an ever-present threat to every contract and every exchange, as buyers can cheat sellers and sellers can cheat buyers. How, then, do trades occur? By what leap of faith do people trust each other enough to enter into contracts and agree to trade? Why is fraud not running rampant in the streets? Fraud does occur, but why is it the exception and not the norm?"

The Trust Triangle summarizes researchers' attempts to answer these questions. It highlights the three primary pathways by which economic agents develop the trust required to overcome the lemons problem and engage in wealth-creating production and exchange activity. The first leg of the triangle refers to third-party enforcement of a society's laws and regulations, which impose restrictions and ex post penalties for sloppy, opportunistic, or cheating behavior and can align counterparties' ex ante incentives. Such third-party enforcement includes regulatory requirements and enforcement actions, government monitoring and penalties for misconduct, criminal law enforcement, and private lawsuits. One reason I trust that my morning coffee is minimally decent – e.g., at least not going to make me sick – is that my society's legal framework

imposes some discipline for illegal behavior that may harm me, and I trust that my barista does not want to get sued, face fines or closure, or go to jail.

Third-party enforcement plays a primary role in the law, economics, and finance literatures. In the U.S., the environment in which firms raise funds and report to their investors is shaped by such federal legislation as the 1933 Securities Act, 1934 Securities and Exchange Act, 1977 Foreign Corrupt Practices Act, 2002 Sarbanes-Oxley Act, and 2010 Dodd-Frank Act. The law and finance literature – which shows how a country's legal institutions affect the development of its financial markets, capital formation, and economic growth, demonstrates how third-party enforcement plays a primary role in creating the trust that is required when investors cede day-to-day control over their financial capital to company managers.[5] To answer the question of what keeps managers from systematically defrauding their investors – and therefore, what keeps fraud from running rampant – third-party enforcement clearly plays an important role.

The second leg of the Trust Triangle refers to **related-party incentives** to behave honestly. Even in a society with no third-party contractual enforcement, firms and individuals who behave honestly attract more customers and have lower costs than firms that lie, cheat, and steal. I trust that I will get a decent, even good, cup of coffee because my barista will lose customers if she gets a reputation for serving bad coffee. Section 3 below develops the ideas behind this second leg of the Trust Triangle by summarizing Klein and Leffler's (1981) model of related-party contractual performance. Karpoff and Lott (1993) call this market-based foundation for trust "reputation," and I refer to the quasi-rent stream that accrues from honest dealing as "reputational capital."

The third leg of the Trust Triangle refers to the personal, moral, religious, societal, and cultural values that discourage cheating even in the absence of penalties imposed by third-parties

[5] See, e.g., La Porta et al. (2002). Cumming, Johan, Zhang, and Zhang (2019) summarize recent research that extends the law and finance literature to consider interactions between legal institutions and culture – two legs of the Trust Triangle.

or related-parties. An additional reason I trust my barista is that I believe her to be a moral person who desires to do the right thing and takes pride in her skill in pulling a shot. If the other legs of the triangle refer to third-party and related-party incentives and enforcement, this third leg can be thought of as **first-party, or self-enforcement**. It reflects the sum of a person's motivation to eschew opportunism and to act honestly even in the absence of the threat of external legal or market penalties.

The recognition of personal and social norms – I will use the term culture – represents a new growth area in finance research.[6] There is still little consensus on exactly what "culture" means or how best to measure it. Some researchers use Hofstede's (2001) concept that culture represents the shared values transmitted over time within a group, especially within national boundaries. This definition lends itself to the use of survey results that imply cross-country differences in attitudes toward individualism, the distribution of power in society, the relation between hard work and higher pay, and other social perceptions. As an example, Burns, Minnick, and Starks (2017) use results from Hofstede (2001) and the World Values Survey to examine whether different attitudes toward income inequality in different countries affects CEO pay. Parsons et al. (2018) infer that cultural norms vary across geography to explain heterogeneous rates of opportunistic behavior among cities in the U.S.

Others define culture more broadly, as reflecting not societal attitudes, but also a person's origins, her individual experiences, and social and business connections. Thus, Liu (2016) examines the link between a CEO's country of origin and her firm's likelihood to commit financial misconduct; Benmelech and Frydman (2015) show that CEOs with military backgrounds pursue relatively conservative investment and financial policies; and Engelberg, Gao and Parsons (2012) show that personal networks and relationships facilitate larger and better-performing loans.

[6] Sapienza and Zingales (2011) provide an excellent overview of finance research that explores the role of culture in the formation of trust and financial activities. Dupont and Karpoff (2020) survey finance research papers that connect various measures of culture to economic outcomes.

The Trust Triangle is not the only way to conceptualize the pathways by which economic actors form the trust that serves as the basis for voluntary exchange and production activity. For example, Williamson (1993) examines the deliberative processes by which individuals develop trust regardless of whether the incentive for good behavior comes from third parties, related parties, or personal culture. Thus, his notion of "calculative trust" overlaps with all three legs of the Trust Triangle, although more so with the first two legs relating to legal institutions and reputational capital. As another example, Carlin, Dorobantu, and Viswanathan (2009) develop a model in which "public trust" arises from agents' private decisions to invest in trustworthiness. Carlin et al.'s notion of public trust includes the portion of the culture leg of the Trust Triangle that arises from social norms and social capital, and their notion of private trust captures part of the market-based discipline that we characterize as reputational capital (i.e., the second leg of the Trust Triangle). Because the Trust Triangle explicitly identifies third-party, related-party, and first-party mechanisms, however, it offers a comprehensive heuristic to consider a broader range of forces that build trust in economic exchange.

3. Construct #2: The Klein-Leffler model

A rich theoretical literature emphasizes the importance of repeat contracting and reputational capital – i.e., the top leg of the Trust Triangle – in overcoming the risk of opportunism and facilitating mutually beneficial exchange and production.[7] In this section I summarize one such model, by Klein and Leffler (1981), that provides a framework to examine the forces that drive fraud and opportunism.

To focus on the role of related-party contracting and reputation, Klein and Leffler begin by assuming a world in which there is no third-party or first-party enforcement or penalties for broken promises. That is, they rule out the bottom two legs of the Trust Triangle and focus only

[7] E.g., see Fama (1980), Telser (1980), Kreps and Wilson (1982), Shapiro (1983), Diamond (1989), and Tirole (1996).

on the top leg. Firms can sell either a high quality or low-quality version of a good, but customers cannot determine the good's quality until after they purchase it. The high-quality good is costlier to produce, so firms have an incentive to make low quality goods at low cost and sell them at the high quality price, pocketing the difference.

Figure 1 from the Klein and Leffler (1981) paper, which is reproduced here as Figure 3, illustrates the framework. MC_{qmin} and AC_{qmin} are the marginal and average costs of producing the low (or minimum) quality good, and MC_{qh} and AC_{qh} are the marginal and average costs of producing the high-quality good. The firm is a price-taker in both the high quality and low-quality markets and can sell the low-quality good at P_0. Production and sale occur one period from now and the discount rate is *r*.

In this setting, the standard competitive model outcome in which the high quality good sells at the minimum average cost of high quality production, P_1, is unstable. The firm can produce the high-quality good and earn zero profits, or it can produce the low-quality good – up to x_3, where marginal cost equals marginal revenue – and sell it as if it were high quality. If the firm cheats like that, it earns a profit equal to

$$W_1 = \frac{1}{1+r}\left\{(P_1 - P_0)x_3 - \int_{x_0}^{x_3}\left(MC_{q_{min}}(x) - P_0\right)dx\right\}. \tag{1}$$

Klein and Leffler assume that the cheating profit can be earned in only one period, as customers will not again trust any firm that cheats and the firm will be unable to sell at any price above P_0 after it cheats. As we will see, the framework yields useful insights if we relax this assumption and assume that the cheating behavior takes time to detect or if customers are not fully informed about it.

The price P_1 is insufficient to induce any sellers to produce the high-quality good. However, if high-quality sellers can sell at above P_1, they can earn a price premium that offsets the inducement to cheat. Figure 3 illustrates such an equilibrium in which the high quality good sells at a price above average cost, P_2. At P_2, high quality sellers produce x_2 units of the good at

an average cost of AC_0 and earn a profit of $(P_2 - AC_0)x_2$. This per-period quasi-rent is illustrated as the blue shaded area in Figure 3. Sellers who continue to provide the high-quality good can expect to earn this quasi-rent every future period, so the present value of producing and selling the high-quality good is

$$W_2 = \frac{1}{r}\left\{\left(P_2 - AC_0\right)x_2\right\}. \tag{2}$$

Of course, the higher price P_2 for the high-quality good changes the incentive to cheat, as a cheating firm can produce x_4 units and gain a one-shot profit of

$$W_3 = \frac{1}{1+r}\left\{\left(P_2 - P_0\right)x_0 + \int_{x_0}^{x_4}\left(MC_{q_{min}}(x) - P_0\right)dx\right\}. \tag{3}$$

Firms selling in the high-quality market thus face a trade-off: Cheat and earn a one-shot profit of W_3, or perform as promised and earn a series of profits over time worth W_2.

Klein and Leffler examine the properties of this equilibrium, especially the fact that the prospect of positive profits (W_2) will induce entry, and propose that the profit stream W_2 is dissipated via upfront product-specific investments, such as advertising, that depreciate in value if the firm cheats. Reputational capital therefore arises as a bond against cheating. It is the portion of the capital value W_2 that is lost if the firm cheats by pretending to sell the high-quality good when it actually sells the low-quality good. Stated more broadly, it is the loss in the firm's quasi-rent stream when the firm is revealed to have cheated or acted opportunistically in ways that harm its counterparties.

Klein and Leffler also determine the condition under which a price premium equilibrium will arise such that some of the high-quality good is produced and sold. The condition for an equilibrium in which reputation – i.e., W_2 – works to provide sufficient incentive for the high-quality good to be produced is:

$$\frac{1}{r} > \frac{x_4 - x_2}{x_2}. \tag{4}$$

The aspect of the model on which I focus, however, is the simple tradeoff it illustrates for sellers. When it comes to cheating, firm's decision rule is:

Cheat if $W_3 > W_2$.

Do not cheat if $W_2 > W_3$.

This decision rule is a special case of Becker's (1968) model in which a person engages in misconduct if the total expected private benefits exceed the total expected private costs. In the Klein-Leffler framework, the probability that a cheating firm is caught is 100% (an assumption I examine below). Before being caught, however, the cheating firm earns profits equal to W_3.

The Klein-Leffler model envisions the provision of a consumer good, but it applies equally well to financial misconduct. Financial reporting most directly affects a firm's cost of capital. Firms that provide high quality financial reporting are able to sell financial claims at relatively high prices. That is, they have a lower cost of capital. Firms that misreport are unable to sell financial claims at the high-quality price, i.e., they suffer an increase in their cost of capital. This implies that, even in the absence of third-party or first-party enforcement, the reputational mechanism captured by the model can work to encourage honest financial reporting.

Although repeat contracting and reputation play central roles in economic models, there is relatively little empirical research on the size and role of reputational capital. This is because it is difficult to measure the stock of a firm's reputational capital or the portion of this capital stock that bonds a firm's honest financial reporting. As Karpoff and Lott (1993) point out, however, we can measure the amount of reputational capital that is lost when a firm is discovered to be cheating. This is because the discovery of misconduct reveals that a firm has effectively made a choice to capture the short-term benefit W_3 and eschew the non-cheating profit stream W_2. We can measure the subsequent loss in firm value that is attributable to the loss of W_2. Observations of financial misconduct allow us to gain insight into the empirical importance of reputational capital because they allow us to measure the reputational capital that is lost, W_2.

Karpoff (2012) and Amiram et al. (2018) summarize the empirical literature that reveals

that firms caught committing financial fraud experience large losses in reputational capital. Point estimates indicate that the average reputational loss is several times the size of the loss from such third-party enforcement activities as securities-related lawsuits and regulatory penalties. Furthermore, firms' reputational losses manifest in the form of higher costs of capital and lower operating profits. Amiram et al. (2018) conclude that these results indicate that reputational capital plays a primary role in encouraging truthful financial reporting and discouraging financial misconduct.

4. Comparative statics of fintech-driven changes

The Klein-Leffler (1981) model characterizes an equilibrium in which cheating and fraud does not occur. So, by itself, it does not directly consider the factors that lead a firm to commit misconduct. However, the Klein-Leffler framework is easily extended to identify factors that lead to fraud. For example, Lott (1988) shows that perturbations in demand or costs of production that are not immediately or costlessly observed by the firm's customers impact W_3 and W_2. They therefore can change $W_3 - W_2$ and affect the firm's incentives to commit fraud.

Consider, for example, the effects on the incentives to commit fraud by the rise of internet-related financial services and transacting. As described by Bhattacharya (2017), such fintech activities include (i) digital payment and remittance, (ii) financial product investment, (iii) peer-to-peer financing and crowdfunding, (iv) cybersecurity and data security, (v) big data and data analytics, (vi) blockchain (i.e., distributed ledger) applications, and (vii) tailored "smart" contracting. This is a wide-ranging series of applications and potential applications, but together, they reflect the promise of three broad developments in the markets for financial services and transactions:

(i) Lower search and other information costs, including the cost of monitoring contracts and transactions;

(ii) Lower transaction costs, including the costs of making and enforcing contracts;

(iii) In some applications, an increase in anonymity among counterparties.

We can use the Klein-Leffler framework to investigate how these changes affect firms' reliance on reputational capital and the incidence of fraud.

4.a. Reliance on reputational capital

Consider first firms' use of reputational capital. Equation (4) indicates that the condition for the rise of a reputation-based quality assuring price premium is as follows:

$$W_2 > W_3 \; iff \; \frac{1}{r} > \frac{x_4 - x_2}{x_2}. \tag{5}$$

Intuitively, condition (5) indicates that the second leg of the Trust Triangle, which is based on related-party enforcement, comes into play if and only if (i) the supply of the low-quality good is not too price-elastic (i.e., x_4 cannot be too large); (ii) the supply of the high-quality good is not too price-inelastic (i.e., x_2 cannot be too small), and (iii) the real rate of interest is sufficiently small (so the long-term gains from not cheating are large enough to deter cheating).

Consider the effects of fintech developments on these parameters and the resulting reliance on related-party enforcement of financial contracts. In financial markets, decreases in information and transaction costs tend to increase the price elasticities of high quality goods because they make it easier for truthful firms to raise substantial amounts of financial capital. The decrease in information costs makes it easier for investors to verify a firm's financial reporting and the decrease in transaction costs make it easier for such firms to exploit investment opportunities by raising outside capital. These forces all work to increase firms' reliance on reputational capital in financial markets.

At least two aspects of fintech-related innovations, however, could work to offset such changes. First, a decrease in transaction costs increases the elasticity of supply of financial claims for both high- and low-quality financial reporting firms. As an example, a low-cost crowdfunding platform helps both honest firms and fraudsters to raise cash. The increased ease with which

fraudsters can raise capital effectively increases the elasticity of supply for the low-quality good. This works against an equilibrium in which high quality is provided because it increases the likelihood that firms will cheat.

The second aspect involves the use of blockchain (or distributed ledger) technology to record and track financial transactions. On one hand, Yermack (2017) argues that an increase in the use of blockchains can facilitate third-party enforcement of financial contracts because it virtually eliminates disputes over transactions and ownership claims. This development could decrease financial firms' need to rely on trust via their investments in reputational capital, even as they decrease the incidence of fraud overall. On the other hand, Stinchcombe (2018) argues that blockchains are extremely poor substitutes for reputational capital and that "Systems built on trust, norms, and institutions inherently function better than the type of no-need-for-trusted-parties systems blockchain envisions."

To the extent that blockchain technology improves and is adapted to widespread use in financial contracting, it could eventually substitute for reliance on reputational capital. Current evidence, however, supports Stinchcombe's more skeptical analysis. For example, Stinchcombe (2018) points out that even such high-profile users of blockchains as Silk Road and Ripple relied upon reputational mechanisms – and not blockchain technology – to create trust among counterparties and make payments. Weighing all factors, I conclude that there are forces that, over time, could decrease reliance on reputational capital to build and bond trust in financial contracting. The forces that work toward a long-term trend of greater importance for reputational capital as a source of trust, however, appear to be stronger.

4.b. Incidence of fraud

Regardless of whether reliance on reputational capital increases or decreases over time, how will fintech innovations affect the incidence of fraud? Recall that the condition for fraud to occur is that there are unexpected deviations in firms' costs or market conditions that cause

changes in W_2 or W_3 such that W_3 becomes larger than W_2. On one hand, several changes from new fintech innovations are likely to promote more fraud:

- An increase in anonymity can increase the gain from cheating by making it easier to sell overpriced securities and by making it easier for fraudsters to re-enter the market after cheating in a prior period. Both effects work to increase W_3 and increase the incentive to cheat.
- Lower cost transactions increase the flow of new customers or investors to a market. This also has the effect of increasing W_3 because the entry of new customers potentially allows a fraudster to operate for longer periods and find new parties with whom to transact.
- As discussed above, a decrease in financial transaction costs can decrease the cost of providing the low-quality good. As applied to financial transactions, this means that firms can more easily raise capital even when they offer low assurance that their financial reporting is of high quality. The effect of this change is to increase the opportunity to commit fraud.

As Cumming et al. (2016) and Conrad et al. (2018) point out, such technology-driven developments that create new opportunities for fraudsters to profit lie at the core of concerns over the development of crowdfunding platforms and regulatory policies.

On the other hand, fintech-related innovations can work to decrease the incidence of fraud:

- A decrease in information costs helps to uncover frauds faster, effectively decreasing the time period during which a fraud can operate and decreasing W_3. For example, Cumming and Johan (2008) show that computer surveillance can facilitate the discovery of misconduct, a trend that should increase firms' reliance on reputational capital and decrease the incidence of fraud.
- A decrease in the cost of information about how counterparties perform, e.g., via web-

based tracking of a firm's history, increases the potential gains from not cheating, W_2, and decreases the gains from cheating, W_3.

- Just as the decrease in transaction costs increases firms' ability to raise more capital when they are fraudsters, so do they increase truthful firms' ability to raise capital, thus increasing the gains from not cheating, W_2, and decreasing the incentive to commit fraud.
- As noted above, a decrease in the cost of tracking financial transactions and reports, e.g., using blockchain technology, may cause a substitution away from the reliance on reputational capital to bond honesty in reporting, as well as in transaction and ownership disputes. But the effect on the incidence of misconduct is clear, as such substitution will occur only if it works more effectively than reputation to discipline and deter fraud.

The net effect of these changes on the incidence of fraud depends on their magnitudes. My own conclusion is that the long-term trend is toward a decrease in fraud, as decreases in information and transaction costs generally increase the gains from not cheating (W2) more than they increase the gains from cheating (W3). I base this conclusion on three observations. First, historical trends are toward a greater use of technology in financial services and yet less fraud. Watered stock, short sales manipulation, pump and dump schemes, and fraudulent stock pools were relatively more commonplace in, say, the 1860s and 1920s, than they are today. Pound (1992) points out that historical developments in corporate governance reflect innovations in communications technology, as corporate raiders and incumbent managers jockeyed for advantage by deploying new technologies in their tactics. Below, I argue that honest dealing is an income normal good, implying that we should observe less fraud as wealth and income grow. This appears as greater demand for financial regulation as countries grow wealthier, and is

facilitated by technological developments that lower information and transaction costs.[8]

Second, equilibrium considerations imply that fintech-driven innovations will be adopted only when the overall expected benefits exceed the expected costs. Fraud is costly, thus decreasing the likelihood that technological innovations that increase fraud will be exploited. Instead, we will see substitution into other contracting mechanisms. As an example, the magnetic strip on retail credit cards facilitates a fast transaction but is easily hacked by fraudsters. The credit card industry has adjusted by substituting into chip readers even though they effectively use an older and slower technology. Such substitution illustrates how practices that increase the risk of fraud will tend not to survive. The tech-driven innovations that survive and proliferate – i.e., that will be selected by the economic environment – will tend to be the ones with lower fraud likelihoods. This argument lies at the core of Stinchcombe's (2018) observation that, to date, blockchain applications continue to be limited in practice.

The third reason I predict a long-term decrease in fraud is that changes in third-party and first-party enforcement of contracts also point to a secular decrease in fraud. This is discussed in the next section.

5. Effects of third-party and first-party enforcement

The previous section uses the Klein-Leffler framework to consider the impact of technological developments on firms' reliance on reputational capital and the incidence of fraud. The Klein-Leffler framework, however, focuses on only one mechanism by which fraud is disciplined and deterred – reputational capital and related party enforcement. In this section I consider the other two legs of the Trust Triangle by assessing the additional impacts of third-party and first-party enforcement.

To do so, it is useful to maintain the general framework that managers and firms will

[8] This observation is consistent with the primary conclusions from the law and finance literature (e.g., La Porta et al., 2002), which shows that economic and financial development are positively related.

commit fraud when the expected benefits exceed the expected costs. But I now expand the benefits and costs to include the effects of third-party and first-party enforcement. A firm that cheats not only foregoes the long-term profit stream worth W_2, but it also faces losses from regulators' fines and private lawsuits. The cheating managers may lose friendships and face social stigma. They also suffer the disutility, loss of self-esteem, and increase in cognitive dissonance from having to face the fact that they acted in ways that violate their own moral codes or ethical principles.

Incorporating such effects, the condition for a manager or firm to cheat now becomes:

Cheat if W_3 > Total expected costs = W_2 + Third-party costs + First-party costs.

Do not cheat if W_3 < Total expected costs.

Here, *Total expected costs* include all three legs of the Trust Triangle. *Third-party costs* refer to the expected costs imposed by third parties such as regulators and courts. It incorporates the expected penalties considered in traditional models of illegal behavior (e.g., as in Becker, 1968) and equals the probability of getting caught times the penalty conditional upon getting caught. *First-party costs* are primarily non-pecuniary and consist of community or cultural sanctions for misconduct and the disutility from violating one's ethical principles and moral code.

A reasonable conjecture is that technological developments are likely to increase *Third-party costs* in most jurisdictions, if for no other reason than they lower information costs for regulators as well as investors. The SEC, for example, increasingly is using big data methods to better identify fraud from firms' filings.[9] Karpoff and Lott (1993) show that regulator-imposed expected penalties are unlikely to be perfect substitutes for reputational capital in disciplining fraud, implying that an increase in *Third-party costs* is unlikely to be totally offset by a decrease in W_2. This implies that technological developments that increase *Third-party costs* are likely to increase *Total expected costs*, thus decreasing the likelihood of fraud.

[9] E.g., see "How AI can help with the detection of financial crimes," available at https://knowledge.wharton.upenn.edu/article/ai-fraud-detection/, accessed on May 7, 2020.

My discussion to this point focuses on how improvements in technology are likely to affect the incidence of financial fraud. Another long-term trend that will likely impact the incidence of fraud is an increase in societal wealth. Increases in wealth no doubt affect both W_2 and *Third-party costs*. For example, *Third-party costs* can increase over time if wealthier societies devote more resources to securities regulation and enforcement. Consistent with such a conjecture, prior research suggests that investor rights are an income normal good and are more secure in wealthier nations (e.g., see La Porta et al., 2002). Likewise, increases in wealth, by definition, increase demands for income normal and income superior goods, which likely include high quality goods and high-quality assurance. Increases in demand for the high-quality good increases the number of markets for which a reputation-based price premium can enforce honest financial reporting and transacting, also likely leading to a decrease in the incidence of fraud.

The most interesting effects of a long-term increase in societal wealth on the incidence of fraud, however, may be via first-party enforcement. Whether the effect is to increase or decrease fraud boils down to an assertion about whether the benefit derived from the culture leg of the Trust Triangle, e.g., via strong personal ethics and societal norms, are income normal goods. Cross-sectional evidence on this question is mixed. Some experiments suggest that higher socio-economic status individuals are more likely to express unethical principles, e.g., they are more likely to say it is acceptable to cheat on one's spouse or on taxes (Trautmann, Van de Kuilen, & Zeckhauser, 2013). Other experiments, in contrast, suggest that people are more likely to behave unethically when they are disadvantaged (e.g., John, Loewenstein, and Rick, 2013). Ariely and Mann (2013, p. 498) argue that the overall evidence is mixed and "... that it is unlikely that either upper- or lower-class people are unequivocally more moral."

Such cross-sectional comparisons, however, beg the question I want to pose, namely: are people across the socio-economic spectrum generally motivated to behave more ethically – for reasons other than the threat of third-party or related-party sanctions – as communities become wealthier?

In light of the mixed cross-sectional empirical evidence to answer this question, we can again appeal to theory. One way to examine this question is to note that ethical behavior is an intangible good – a person consumes her ethical behavior to the extent she decides to forego other things to indulge it. Economists and philosophers have long emphasized the importance of such intangibles to most people. Indeed, Adam Smith (1790) motivates *A Theory of Moral Sentiments* by noting in his very first paragraph that most people care about the well-being of others. It also is common to assume that a person's willingness and ability to pay for intangible goods, including altruism and ethical behavior, increases with wealth. For example, Maslow's hierarchy of needs is built upon the assumption that intangibles such as self-esteem and the (costly) practice of moral principles are income normal goods. Fukuyama (1995) argues that social capital, which he considers to be a foundation of societal trust, facilitates and is facilitated by economic growth. Such constructs imply that ethical behavior is most likely to be income normal, i.e., people generally demand and are willing to pay for more ethical behavior as they become better off. To the extent that the consumption of ethical behavior is income normal, an increase in societal wealth should lead to greater commitment to and consumption of ethical behavior, leading to a decrease in the incidence of fraud.

6. Offsetting forces that could lead to more fraud over time

Even if my optimistic conjecture of a long-term decrease in fraud is correct, the trend is likely to be neither inexorable nor monotonic. Forces that could mitigate the long-term trend toward a decrease in fraud are the COVID-19 pandemic and resulting economic shutdown, informational and behavioral frictions, rising mistrust in institutions, and economic inequality.

6.1. The COVID-19 pandemic and economic shutdown

The COVID-19 pandemic and economic shutdown of 2020 create an environment in which fraud becomes more – not less – likely, at least over the next couple of years. This is for

three reasons. First, both theory and evidence indicate that financially troubled firms are more likely to commit fraud (e.g., Maksimovic and Titman 1992; Files et al., 2019). The economic shutdown imposes large costs and threatens the survival of many firms, thus creating more situations in which the short-term benefits of fraud (W_3) exceed the long-term benefits from not engaging in fraud (W_2).

Second, the pandemic and economic shutdown is creating large shifts in the composition of aggregate demand. Many goods and services that once were in high demand – air travel and cruise ships – now face lower demand, while other goods and services – personal protective equipment, online purchasing and delivery – are in high demand. Shifts in relative demand are rarely frictionless, as it is costly to adjust supply chains and production processes to re-allocate resources from old markets to meet new demands. Producers have fixed investments in technology, human capital, physical assets, and inventory, making it difficult to interpret and respond to shifting signals from price changes. This changes the costs and benefits of many activities, including fraud. Such changes can be represented in Figure 3 as shifts in the costs of producing the high quality and low quality goods (MC_{qh} and MC_{qmin}), as well as changes in demands that affect the output prices P_1 and P_2. As described in Section 4, fraud arises as a disequilibrium phenomenon when there is asymmetric information about the benefits and costs of opportunistic behavior, i.e., when the buyer and seller have different information about MC_{qh}, MC_{qmin}, P_1, and P_2. With asymmetric information, situations can arise in which the buyer believes that the seller's net benefits of cheating are negative (i.e., $W_2 > W_3$), when in fact the opposite is true ($W_2 < W_3$) and the seller decides to cheat.

The changes in relative demands created by the pandemic and economic shutdown will change the benefits and costs of cheating in ways that are not equally transparent to firm managers, investors, and other stakeholders, thus creating new information asymmetries about the values of W_2 and W_3 in various contractual relationships. This increases the likelihood that, for any given contract, the short-term benefits of fraud become attractive (i.e., $W_2 < W_3$), thus

increasing the incidence of fraud. Firms and investors will adjust endogenously to such new incentives. The value of an auditor's opinion is likely to increase, for example, and firms might increase their disclosures of financial risk, to better bond their commitments to investors. But such endogenous adjustments are unlikely to completely offset the increased incentives for fraud, thus increasing its incidence during the post-pandemic adjustment period.

The third reason that the COVID-19 pandemic is likely to lead to a short-term increase in fraud is that the pandemic and economic shutdown have destroyed many firms' organizational capital. By organizational capital, I mean the portion of firm value that exceeds the sum of its parts. It reflects the quasi-rents from employees' firm-specific investments in human capital, i.e., the firm-specific know-how that is lost as employees are laid off or leave for other reasons. And it reflects the firm-specific investments in reputational capital that is the focus of Section 4 above. With less reputational and organizational capital now at stake to bond firms' commitments, many firms will have less to lose from cheating on their explicit and implicit contracts. In terms of the Klein-Leffler framework, the pandemic and shutdown have destroyed much of the value W_2 that acts as a commitment bond against engaging in fraud. With lower W_2, the condition for fraud to occur ($W_2 < W_3$) will arise for more firms, including for financial fraud.

6.2. Informational and behavioral frictions

In the Klein-Leffler framework discussed in Section 4, consumers learn immediately if a firm cheats, and all consumers adjust immediately by refusing to buy from the firm at the high quality price. In practice, information about a firm's fraudulent behavior can be costly, slow, and diffuse. Even when potential counterparties do learn about a firm's misconduct, they might be slow to adjust their behavior and continue to buy from the firm at the high-quality price. As a result, some fraudulent firms can perpetuate their frauds for some time. And even when they are caught, they might still induce some uninformed or irrational counterparties to do business with

them at the high-quality price. In other words, informational and behavioral frictions can make the short-term gain from cheating (W_3) quite large.

In this framework of this paper, informational and behavioral frictions that increase W_3 have three effects. First, the condition for a reputational solution to the contracting problem becomes more difficult to satisfy. This can be observed by reference to equation (5), as the condition for a reputation-enforcing price premium becomes less likely. Intuitively, if W_3 is sufficiently large, it will be impossible to find an equilibrium price premium $P_2 - P_1$ that encourages honest dealing. Second, even if an equilibrium price premium does exist and the condition in equation (5) is satisfied (i.e., $W_2 > W_3$), it is done so only at a higher investment in reputational capital. That is, frictions that increase W_3 will induce endogenous adjustments in which firms and their counterparties build trust through even larger investments in reputational capital. Third, the increased cost of relying on reputational capital will induce substitution into the other legs of the Trust Triangle. In the extreme, if the condition in equation (5) is not met, the reputational leg of the Trust Triangle will not work and economic contracting is possible only if there are sufficient incentives provided by third-party legal institutions and/or first-party and cultural inducements to discourage fraud.

To the extent that third-party and cultural enforcement are not perfect substitutes for reputational capital to encourage honest dealing, the net effect is toward an increase in the likelihood and incidence of fraud. The incidence of fraud is therefore positively related to the size and importance of informational and behavioral frictions that inhibit the role of markets and reputational capital in discouraging fraud. In Section 5 above, I argue that technological innovations tend to decrease informational frictions. But to the extent that other types of informational and/or behavioral frictions increase over time, this would offset any long-term trend toward a decrease in fraud.

6.3. Institutional mistrust and income inequality

Yet other contemporaneous forces could work to counter my relatively optimistic forecast of a long-term decrease in the incidence of financial fraud. Levin (2020), for example, points to a society-wide decline in trust in institutions, including government, business, and the family. A breakdown in institutional trust can undermine all three legs of the Trust Triangle, promoting an increase in fraud. As one example, if the SEC were to become widely viewed as a political tool rather than an impartial regulator of financial markets, this would undermine the disincentive for fraud provided by the prospect of third-party enforcement for many firms. As another example, Dupont (2020) finds that the Catholic church sexual abuse scandal worked to undermine trust in many U.S. communities, affecting both Catholics' and non-Catholics' willingness to invest in the stock market. A decrease in trust of such cultural institutions works to undermine the cultural leg of the Trust Triangle, fostering an environment in which fraud becomes more likely.

A reviewer suggests that an increase in income inequality also can lead to an increase in fraud if it breeds corruption and renders legal enforcement of wealthy individuals and firms ineffectual. If income inequality were to increase over time, we could see less or biased enforcement of securities laws, as regulators become captured by an increasingly wealthy elite. An increase in income inequality could undermine the social compact that provides legitimacy for governmental and business institutions, thus diminishing cultural or first-party constraints on unethical behavior. Such developments would probably trigger an increased reliance on reputational capital as the medium through which trust is formed and maintained in economic contracting. But the net effect could be to slow the long-term decrease in fraud over time.

7. Conclusions

This paper proposes that the Trust Triangle and the Klein-Leffler (1981) model of related-party contractual enforcement are useful constructs for considering the motivation and

incidence of financial fraud. I consider the effects of changing technology and increases in societal wealth to make comparative statics predictions about long-term forces that are likely to affect the incidence of fraud. Using these constructs, I identify some changes that will work to increase the incidence of fraud. For example, the development of crowdfunding platforms creates opportunities for fraudsters to hide their identities or funding histories, thereby increasing the incentive to commit fraud. The COVID-19 pandemic and resulting economic shutdown also have disrupted relative demands and organizational capital in ways that will likely increase the incidence over the next couple years.

Many other developments, however, are working to decrease the incidence of fraud in financial markets over the long run. Decreases in information, search, and transaction costs all work to decrease the potential gains from fraud. An increase in the use of blockchain technology can decrease the opportunities and profitability of fraud, also decreasing its incidence. The Trust Triangle indicates that fraud is disciplined and deterred via a combination of first-party, related-party, and third-party enforcement. I argue that all three of these mechanisms are likely to be strengthened by increases in societal wealth. If so, the incidence of fraud should decrease over time due to increases in both technology and wealth.

Such predictions are clearly speculative. They also depend on the signs and sizes of the cross-elasticities of the Trust Triangle's three legs. For example, an application of blockchain technology to the trading of shares of stock in secondary markets might decrease a potential fraudster's short-term gain from cheating, W_3. But my prediction that such changes will lead to a long-term decline in the incidence of fraud reflects an assumption that other parts of the Trust Triangle are not severely and negatively affected, e.g., that the reliance on third-party or first-party enforcement does not decrease severely. It remains to future research to measure whether, and in what direction, and by what magnitude, innovations in first-party, related-party, and third-party enforcement of fraud affect each other.

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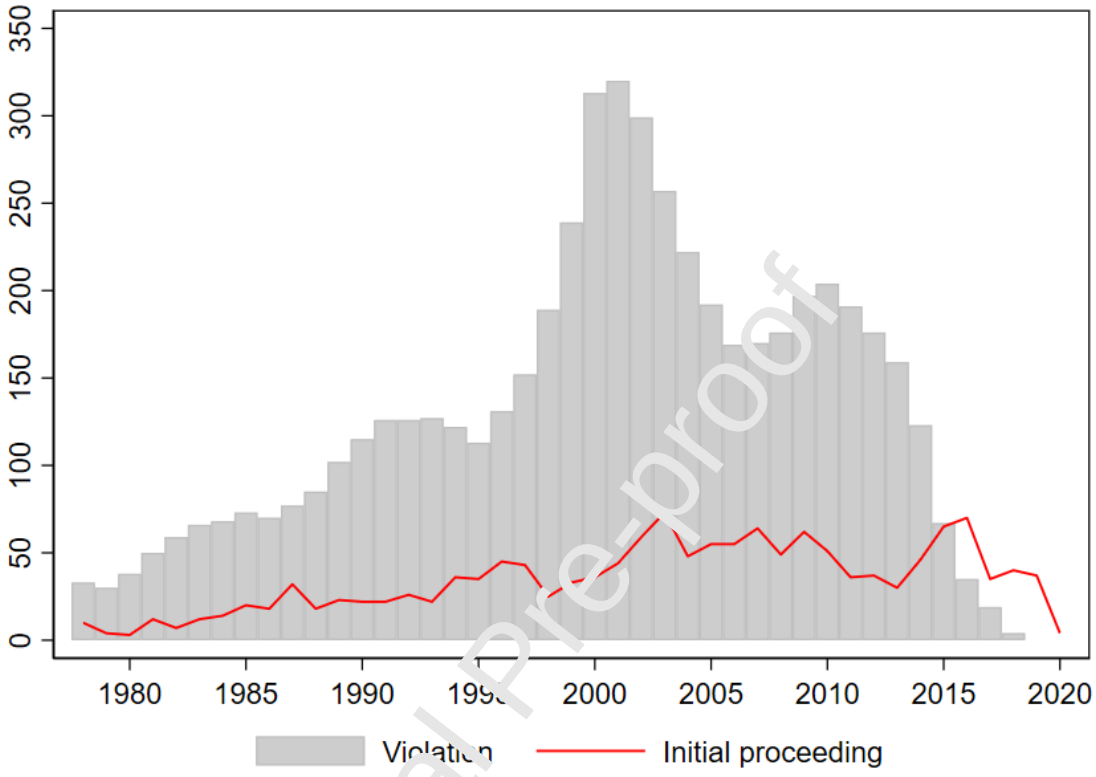

Figure 1: Annual distribution of SEC and DOJ enforcement actions for financial misrepresentation and associated violation periods

The red line indicates the number of enforcement actions for financial misrepresentation at publicly traded companies initiated by the SEC or DOJ by year from 1978 through March 2020. Financial misrepresentation refers to violation of the books and records and/or internal controls provisions of the Securities Exchange Act of 1934 as amended by the Foreign Corrupt Practices Act of 1977. The gray bars indicate the number of firms misrepresenting their financials per year, as indicated by the SEC's and DOJ's enforcement proceedings. Data are from Gerald S. Martin.

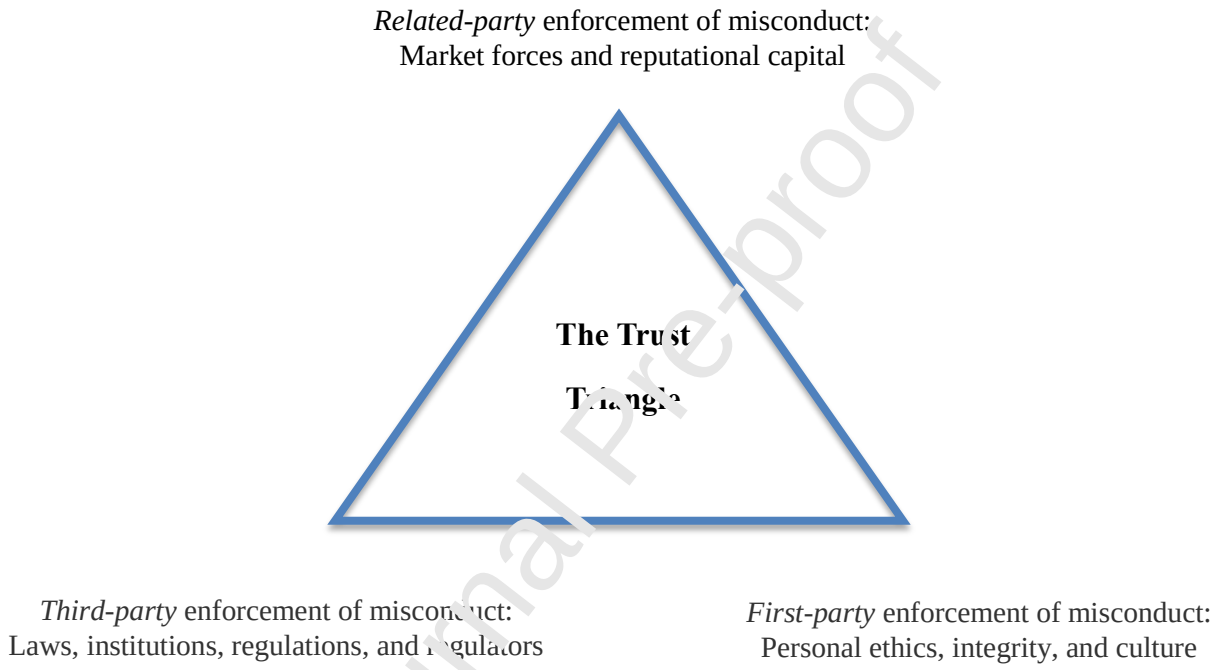

Figure 2: The Trust Triangle

Figure 2 replicates the Trust Triangle from Dupont and Karpoff (2020). It summarizes three main pathways by which opportunistic or fraudulent behavior is disciplined and deterred, and by which counterparty trust is formed in economic transactions.

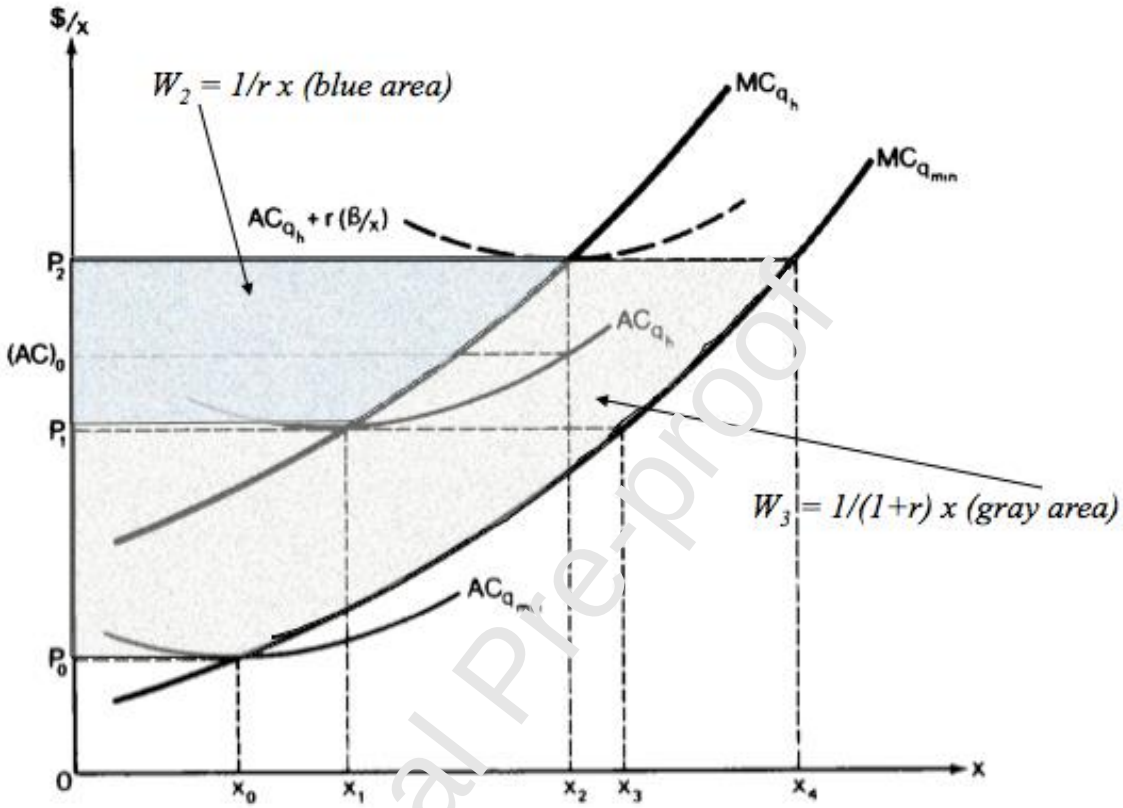

Figure 3: Contractual enforcement via reputational capital

Figure 3 is a replication of Klein and Leffler's (1981) Figure 1. It illustrates the marginal and average cost curves for producing high- and low-quality levels of an arbitrary good. The shaded blue area represents the per-period quasi-rent from providing the high quality version of the good, and W_2 is the present value of providing the high quality version. The shaded gray area represents the gain from cheating by promising high quality but producing and selling low quality. Under the assumption that a cheating seller can remain undetected for only one period, the present value of the gain from cheating is W_3.

Highlights

Is financial fraud becoming a bigger or smaller problem over time? Current empirical approaches to this question generate mixed inferences. As an alternative, I use two theoretical constructs that isolate several factors that motivate fraud, and use them to consider the impact of technological and wealth changes over time. Some changes, such as an increase in anonymity in some financial transactions, facilitate new fraud innovations and increase the possibility of fraud. The COVID-19 pandemic and resulting economic shutdown has fostered major disruptions in relative demands and organizational capital that also increase the likelihood of fraud over the next few years. Viewed over a longer time scale, however, the majority of technological and wealth changes seem likely to increase the use and effectiveness of reputational capital, third-party enforcement, and ethical motivations as fraud deterrents. I predict that, on net, these changes will work to drive a long-term decrease in the incidence of fraud.