

Safety from False Convictions by Boaz Sangero – Book Review

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Introduction

In his new book "Safety from False Convictions"¹ Boaz Sangero develops his thesis, that was originally conceived together with Mordechai Halpert, to view the criminal law system as a "safety-critical system", much like the aviation field and the pharmaceuticals and drugs field, where every accident could result in catastrophic damage, especially the loss of life.² According to Sangero, A false conviction is no less an accident than a fighter airplane crash, because it can cause grave harm to the individual and society in general. This grave harm is manifested by the deprivation of liberty in the form of imprisonment and even loss of life through the death penalty.³ Sangero claims that it is therefore the state's moral duty to adopt and implement safety measures in the criminal justice system, like it does in other safety-critical fields.⁴ Sangero further argues that there is also an economic rationale for safety in the criminal justice system.⁵

After he tries to substantiate the analogy between criminal justice system and other safety-critical systems, Sangero dwells on the fundamentals of modern system-safety. The rest of the book is dedicated to offering examples for safety principles, procedures and rules that should govern the yet unexisting field of safety in the criminal justice system, which Sangero derives from the experience accumulated in other fields. Sangero develops safety models in evidence law as well as in criminal procedure. For example, one of the most important suggestions of Sangero is to establish the Safety in the Criminal Justice System Institute (SCJSI), which will supervise the ongoing and never-ending effort to improve safety in the criminal justice system (that is, minimization of the false

¹ BOAZ SANGERO, SAFETY FROM FALSE CONVICTIONS (2016).

² See Mordechai Halpert & Boaz Sangero, *Toward Safety in Criminal Law*, 36 IYUNEY MISHPAT 363 (2013) (in Hebrew).

³ SANGERO, *supra* note 1, at 1-2. It should be noted, in that context, that most of the criminal law does not concern serious crimes that can lead to long imprisonments, life sentences or the death penalty. For example, most traffic offences, tax offences, environmental offences will not lead to defendant's imprisonment. Sangero's opinion is that such behaviours should not be criminalized in the first place, and we tend to agree with this view, but nevertheless it should be noted that Sangero's analogy does not apply to a wide part of the current criminal law.

⁴ *Id.* at 14-19.

⁵ *Id.* at 19-22.

conviction rate), much like the FAA in the aviation field or the FDA in the area of food and drugs.⁶

Sangero's effort to devise an all-encompassing theory that promotes the worthy cause of reducing false conviction rate in the criminal justice system, is praiseworthy and will surely contribute to the ongoing debate about the false conviction rate and the measures needed to decrease it to the bare minimum. This debate will raise the awareness of the criminal justice community to the problem of false convictions, which is sometimes ignored due to what Sangero & Halper called the Hidden Accidents Principle.⁷ In doing so, Sangero already achieved one of his main goals. Furthermore, we think that some of Sangero's proposals are much needed and should be adopted by policymakers. Certainly, those ideas which can reduce the false conviction rate with a minimal cost or no cost at all, but even some of the more "expensive" proposals of Sangero should be considered seriously – especially in the field of forensic evidence, as mentioned below.

However, we think there are three basic problems with the Sangero's safety theory. Firstly, although at first glance Sangero's theory seems to introduce a whole new set of terms and ideas to criminal law, taken from a well-established doctrine of safety, a closer inspection reveals a great similarity between a large part of Sangero's theory and other "rules theories" in evidence law, especially Alex Stein's "equal best" principle. Accordingly, a large part of Sangero's theory is exposed to the same kind of criticism that Stein's theory was subjected to.

Secondly, the justification for Sangero's safety theory relays heavily on the assumption that false conviction rate is currently higher than we use to think, and that the actual false conviction rate cannot be accepted from a moral, social or economic standpoint. Unfortunately, this crucial assumption for Sangero's theory is not backed by strong empirical data. To compensate for this disability, Sangero relays heavily on the Hidden Accidents Principle, although this principle cannot help us estimate the correct false conviction rate or the measures needed to reduce it.

Thirdly, Sangero implies that incorporating safety into the criminal justice system could be a win-win situation, as resources could be allocated to assessing and identifying hazards and risks, and instituting safety measures to reduce both wrongful convictions and wrongful acquittals.⁸ We will argue that a win-win

⁶ *Id.* at 80-84.

⁷ Halper & Sangero, *supra* note 2, at 398-402.

⁸ SANGERO, *supra* note 1, at 26.

situation can only be attained in a narrow sense, where the "safety procedure" will increase the relevant data presented before the tribunal or increase the accuracy of a forensic technic, without changing the burden of proof, and as long as its cost is negligible. In all other cases, Sangero's theory is indeed limited to "safety from false convictions" and not safety from wrongful acquittals.

After examining those three fundamental problems in Sangero's theory we will inspect more closely three of his specific suggestions to improve the "safety" of the criminal justice system: can a confession be a key piece of evidence for a conviction; should a single piece of evidence be sufficient for a conviction; and implementing the modern safety model STAMP in the criminal justice system. Naturally, in this short article we won't be able to cover some other important matters dealt by Sangero in his book, and they will be left for future deliberation.

Safety in evidence law as a "rules theory"

Sangero's safety theory relates to three areas of the criminal justice system: organizational issues (like the establishment of the SCJSI), forensic sciences and evidence law. The part of Sangero's theory that relates to evidence law includes, for example, his proposals to impose a general principle that a conviction must not be based on a sole piece of evidence,⁹ to adjust the Beyond-a-Reasonable-Doubt Standard,¹⁰ to disallow a conviction based on confession unless there is a strong corroboration and unless there are indications that the interrogee knew unrevealed details about the crime scene¹¹, etc.

In general, evidence law theories can be divided into "free proof" theories and "rules theories". The "free proof" approach to evidence law favors a broad discretion to fact-finders in all matters concerning the fact-finding process, including admissibility issues, the way the evidentiary process should be conducted, the inference process and even the standard of proof. The most prominent advocate of this approach in the last decades is L. J. Cohen, who based his ideal of free proof on the universal cognitive ability to make correct inferences from evidence.¹²

On the other hand, Alex Stein who was willing to embrace Cohen's assumption about our mutual cognitive ability argued, quite rightly, that the inference process in criminal law cannot be detached from moral decisions. Specifically, the fact-finding process, according to Stein, will always involve allocation of the risk of

⁹ *Id.* at 57-64.

¹⁰ *Id.* at 65-66.

¹¹ *Id.* at 95.

¹² L. Jonathan Cohen, *Freedom of Proof*, in *FACTS IN LAW* 1, 4-5 (William Twining ed., 1983).

error in criminal trials (Type I errors, false convictions, versus Type II errors, false acquittals).¹³ According to Stein's "equal best" principle, the state must do its best to protect the defendant from the risk of erroneous conviction and must not provide better protection to other individuals, meaning that the state should enact evidentiary rules that will regulate both the admissibility of evidence and its sufficiency.¹⁴

Implementing Sangero's safety theory in evidence law, demands that the state will continuously enact evidentiary rules that will diminish false conviction rate, as a part of an ongoing process of risk reduction.¹⁵ As can easily be seen, that demand is equivalent to Stein's "equal best" principle, mentioned above. Like Stein's theory, Sangero's safety theory can be viewed as an awkward attempt (an attempt that is not based on empirical data) to reduce the risk of false conviction, while raising the risk of false acquittal, in a way that deviates from the social agreement about the allocation of the risk of error in criminal trials, which is already reflected by the standard of proof.¹⁶ As Larry Laudan pointed out, for every existing evidentiary rule we can always conceive a stricter rule that will grant defendants a better protection from false convictions, but this recursive move will eventually lead us to an absurd rule that deems every incriminating evidence inadmissible.¹⁷

The best way to demonstrate this flow in Sangero's theory is to return to his analogy between criminal justice system and other safety-critical systems. Let's take a closer look at road transportation, which is clearly a "safety-critical system". In the years 2009-2014 approximately 32,000 people were killed every year in car accidents across the United States and many more were injured. In previous years, the numbers were even higher. Next to that distressing data, that is published on the National Highway Traffic Safety Administration (NHTSA) website,¹⁸ there are recommendations for safety technologies that can save many lives, such as: Dynamic Brake Support, Crash Imminent Braking, Rearview Video System, Forward Collision Warning, Lane Departure Warning and more.¹⁹ None of them are currently mandatory (RVS will become mandatory for new vehicles in May 2018). The economic reason not to compel car manufacturers to include those safety technologies in new vehicles is both cruel and simple: the

¹³ Alex Stein, *Against 'Free Proof'*, 31 *ISR. L. REV.* 573 (1997).

¹⁴ ALEX STEIN, *FOUNDATIONS OF EVIDENCE LAW* 3 & 172-178 (2005).

¹⁵ SANGERO, *supra* note 1, at 18 & 55.

¹⁶ *See* LARRY LAUDAN, *TRUTH, ERROR AND CRIMINAL LAW – AN ESSAY IN LEGAL EPISTEMOLOGY* 117-146 (2006).

¹⁷ *Id.* at 131.

¹⁸ *Available at* <https://www-fars.nhtsa.dot.gov/Main/index.aspx>.

¹⁹ *Available at* <https://www.nhtsa.gov/equipment/safety-technologies>.

state is willing to sacrifice many lives for the social benefit of affordable cars. In fact, that is the case for every safety-critical system: the best safety measure will always be to forgo the activity altogether, but if we are not willing to resort to such a drastic measure, some (or even many) catastrophic accidents are bound to happen.

Let's return now to the criminal justice system. Why not hold every criminal trial twice before two different tribunals, and only if the defendant is convicted twice he will be found guilty. At first sight, this seem like a great safety precaution, but naturally this suggestion will double the costs of any criminal trial. Moreover, we can reduce this suggestion to absurdity by offering to repeat the trial an infinite number of times. But no matter what safety measures are taken, it's obvious that not all false convictions can be prevented. The question of how many criminal trial "accidents" we want to prevent and at what cost, will be resolved by using moral and economic considerations. Basically, it's the same risk allocation dilemma once again.

Therefore, the true force of Sangero's safety theory lies in the parts of his theory that do not change the risk allocation in criminal trials and does not impose great costs. One example for that line of thinking is the recommendations mentioned by Sangero on how to improve the police lineup identification protocol in accordance with psychological studies.²⁰ Another example is Sangero's suggestion that "incidents" in the criminal justice system, like perjury or falsification of evidence by a police investigator, forensic laboratory technician or prosecutor, will be thoroughly investigated so as to identify the system failures.²¹

Similarly, in the field of forensic sciences Sangero suggested some much-needed improvements based on the National Academy of Sciences (NAS) 2009 report and on National Association of Criminal Defense Lawyers (NACDL) 2010 report. In particular, Sangero pointed out that due to the *Daubert* rule, judges should have become "gatekeepers", preventing the entry into the courtroom of evidence that is not scientifically reliable or valid. In reality, tough, judges lack the expertise in the scientific or pseudoscientific fields ("junk science") they need to approve.²² To overcome this obstacle Sangero suggests to adopt the NACDL recommendation to establish a central science-based federal agency. One of its central roles will be determining the validity, limitations, and measures of

²⁰ SANGERO, *supra* note 1, at 187-194.

²¹ *Id.* at 86. It should be noted, tough, that unlike Sangero we don't think a court acquittal should necessarily be considered an "incident". On the contrary, in most cases, acquittals indicate that the justice system operates as it should.

²² SANGERO, *supra* note 1, at 142-143.

uncertainty of forensic theories and techniques.²³ This recommendation, along with other similar recommendations mentioned by Sangero in the field of forensic sciences, are examples of a win-win situation, where we can improve the accuracy of the criminal justice system without changing the allocation of the risk of error, and at a reasonable cost. We will elaborate this point in another chapter.

Estimating the false conviction rate

Nowadays it is common knowledge that false convictions do happen. Their rate, however, is controversial. Sangero tries to estimate the rate of false conviction by two methods: a theoretical calculation based on the criminal standard of proof and a calculation based on empirical data. As we shall demonstrate below, both methods are not convincing.

Sangero's theoretical estimate of the rate of false conviction assumes that judges use Blackstone's 1:10 ratio as a decision rule for finding defendants' guilt, which means that they are willing to convict a defendant even when there is only a 90 percent certainty of his guilt (that assumption is based on some surveys of judges). According to that assumption, approximately 78,000 defendants are wrongly convicted in the United States every year (5 percent from all convicts).²⁴

We argue that even if a judge answered on a survey that the required threshold of proof in criminal law is 90 percent certainty of guilt,²⁵ it does not necessarily mean that she will be willing to send a defendant to a long-term imprisonment when she is not absolutely certain (100% percent or almost 100% subjective certainty) of his guilt.

Furthermore, we believe that Laurence Tribe was right when he argued that judges do not think in probabilistic terms.²⁶ Firstly, some of the judges may not even understand the true meaning of a 90 percent threshold, due to lack of adequate statistical knowledge. Secondly, even if a judge thinks there is a 10 percent chance that the defendant is innocent, and he is still willing to convict him, the actual rate of error may be smaller, due to inadmissible data taken into account by the police and the prosecution before the decision to investigate or to

²³ *Id.* at 154.

²⁴ *Id.* at 6-7 and *see also* Halpert & Sangero, *supra* note 2, at 402-8.

²⁵ It should be noted that many judges refused to answer, or answered that the required threshold of proof in criminal law is 100 percent certainty of guilt (*see* C.M.A. McCauliff, *Burdens of Proof: Degrees of Belief, Quanta of Evidence, or Constitutional Guarantees?*, 35 VAND. L. REV. 1293, 1325-6 & 1332-2 (1982)).

²⁶ Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1372-5 (1971).

indict, like a polygraph test, criminal intelligence or the suspect's criminal record. The judges may count on such hidden safeguards, in the back of their minds. Thirdly, the psychological condition of a judge that feels she is absolutely certain of the guilt of a defendant and decides to convict him, even though she is aware that a false conviction is always a possibility,²⁷ can be explained by the inductive logic of L. J. Cohen.²⁸ The Beyond-a-Reasonable-Doubt standard is explained by Cohen as follows:

"In constructing a proof beyond reasonable doubt we have to eliminate in turn each legitimate reason for doubting what we want to prove"²⁹

That is, after eliminating all possible scenarios of innocence, inductive logic lets us reach absolute certainty of the defendant guilt (a probability of 1), even though the remote possibility that the defendant is in fact innocent will always exist.

The second attempt of Sangero to estimate the rate of false conviction relies on three empirical studies.³⁰ The first study of Michael Risinger tried to deduce the rate of false conviction from a group of **11 cases** of false conviction for capital rape-murder **between 1982 and 1989** that had been uncovered by the Innocence Project. Risinger tried to calculate the total number of cases with similar characteristics in the same period of time, where DNA samples had been preserved, and concluded (using some additional assumptions) that the false conviction rate was at least 5 percent.³¹

The second study initiated by the State of Virginia compared samples that had been found in the crime scene with samples taken from the defendants. Data were gathered on 634 cases of rape, sexual assault, murder and manslaughter **between 1973 and 1987**. In **33 of those cases** researchers found exculpatory evidence. By omitting the cases where DNA tests were not possible, Sangero argued that this study indicates 15 to 18 percent of false conviction rate.³²

²⁷ That situation was described by Ronald J. Allen (see Ronald J. Allen, *On the Significance of Batting Averages and Strikeout Totals: A Clarification of the 'Naked Statistical Evidence' Debate, the Meaning of 'Evidence', and the Requirement of Proof Beyond a Reasonable Doubt*, 65 TUL. L. REV. 1093, 1104 (1991)).

²⁸ See L. JONATHAN COHEN, *THE PROBABLE AND THE PROVABLE* (1977).

²⁹ L. Jonathan Cohen, *The Logic of Proof*, 1980 CRIM. L. REV. 91, 10.

³⁰ Some of those studies are also mentioned by Halpert & Sangero, *supra* note 2, at 405-8.

³¹ SANGERO, *supra* note 1, at 8-9.

³² *Id.* at 9-11.

The third study by Gross et al. from 2014 tried to estimate the rates of false conviction of criminal defendants who are sentenced to death. The researchers gathered data on 7482 death-sentenced inmates in the United States **between 1973 and 2004**. Of these, **117 defendants** were exonerated. The researchers speculated that because the intensive search for possible errors is largely abandoned once the threat of execution is removed, the actual rate of false conviction is higher than 1.5 percent. Using a "survival analysis" model they reached the estimate of 4.1 percent.³³

The three above mentioned studies, combined, examined only 161 cases of false conviction over three decades, while in 2012 alone 1,571,013 prisoners were convicted in the United States.³⁴ Therefore, it seems hard to substantiate a whole safety theory on such meager empirical data, no matter how good the extrapolation methods are. Especially when some of the data is already old, when the forensic methods have improved dramatically over the years (like DNA profiling) and when the data relates only to a small fraction of all criminal offences (the most serious ones, where the social pressure to apprehend and to imprison the offender is highest).

But Sangero has one more card up his sleeve: The Hidden Accidents Principle, which he devised together with Halpert, that is described as follows:

"The general inability to detect false convictions is a prominent characteristic of criminal law, and these 'accidents' typically 'remain undetected'. This inability 'translates into optimism on the part of policymakers that false convictions only occur at negligible rate' ".³⁵

Evidently, this principle – and especially its magnitude – cannot be empirically tested for refutability because the relevant data is "hidden", and so it does not adhere to Karl Popper's principle of falsifiability.³⁶ Moreover, from an economic perspective there is no relevance to a variable (allegedly false convictions) that is "hidden" from the public, and therefore does not affect social behavior or public confidence in the judiciary. Even from a moral point of view it's questionable if we should take safety measures to prevent hypothetical "accidents", while those measures will certainly and very tangibly harm other important moral values, like the right to personal security. Finally, it would be very hard, practically, to take

³³ *Id.* at 12-13.

³⁴ *See Id.* at 6.

³⁵ *Id.* at 56 and *see also* Halpert & Sangero, *supra* note 2, at 398-402.

³⁶ KARL POPPER, CONJECTURES AND REFUTATIONS – THE GROWTH OF SCIENTIFIC KNOWLEDGE 33-58 (5th ed., 1989).

effective safety measures against an "enemy" we can't observe, and we might end up throwing the baby out with the bath water.

As we have shown, Sangero was unable to prove that the false conviction rate in the last decades is substantial or that it exceeds the common knowledge and acceptance of the allocation of the risk of error in criminal trials.

But the high rate of conviction ("accident" rate) is a central theme and an essential assumption in Sangero's safety theory. In Sangero's own words:

"... the discussion throughout the book will suffice with what is emerging to be conservative assumption of a false-conviction rate of 5-10 percent in general and 5 percent for the most serious offenses".³⁷

Without that assumption, the justification for establishing a new comprehensive safety system in the criminal justice field is greatly diminished. When we consider installing a new safety system, in any field, the expected value of the cost of accidents is a key datum. If the expected value of the cost of accidents is already very low, there is no economic justification for taking expensive precautions to prevent them and no moral justification for taking precautions that will harm other important social values, like public order.

Our conclusion, then, is that Sangero did not manage to justify the need for a new comprehensive safety system in the criminal justice field, beyond the rules and procedures that are already in place today. Even so, some of Sangero's recommendations for specific "safety" measures that need to be taken in the criminal justice system are worthy, as mentioned above.³⁸

Is Sangero's theory a win-win solution

As mentioned above, Sangero implies that incorporating safety into the criminal justice system could be a win-win situation, as resources could be allocated to assessing and identifying hazards and risks, and instituting safety measures to reduce both wrongful convictions and wrongful acquittals.³⁹

First of all, in the most formalistic sense, a safety measure can never lead to a win-win situation because it has a cost. Law enforcement's resources are always

³⁷ SANGERO, *supra* note 1, at 14.

³⁸ See also Mordechai Levi, *The Risk of False Convictions in Israel – Its main causes and suggestion for its reduction*, 10 MOZNEI MISHPAT 11 (2015) (in Hebrew); Boaz Sangero, *Not a Risk but a Phenomena – An Answer to Mordechai Levi*, 10 MOZNEI MISHPAT 51 (2015) (in Hebrew).

³⁹ SANGERO, *supra* note 1, at 26 and see also Halpert & Sangero, *supra* note 2, at 374.

limited, and every dollar spent on safety is one less dollar spent on crime control. This fact is particularly noticeable when we consider some of Sangero's most expensive suggestions, like completely abolishing the plea-bargain system⁴⁰ or expanding significantly the post-conviction proceedings.⁴¹

Nevertheless, we are willing to admit that the cost of some "safety measures" can be considered negligible. Even then, we argue that a win-win situation can only be attained in a narrow sense, when the "safety procedure" will increase the relevant data presented before the tribunal or increase the accuracy of a forensic technic, without changing the burden of proof, in practice. In all other cases, Sangero's theory is indeed limited to "safety from false convictions" and not safety from wrongful acquittals. We will use the rules concerning eyewitness identification to clarify this point.

In his new book, Sangero summarizes the professional literature that holds that an erroneous eyewitness identification is far from rare.⁴² That literature is undisputed among scholars nowadays. Sangero suggests a wide range of "safety measures" to tackle this problem. The most prominent one is to disallow a conviction based solely on eyewitness testimony.⁴³ This suggestion will clearly change the risk allocation in criminal trials, by preventing false convictions based on erroneous eyewitness identification, on one hand, while setting free a lot of criminals, on the other hand. The same logic can lead us to even a more radical "safety measure" that will deem eyewitness testimony inadmissible altogether. Those safety measures will surely increase the "safety from false convictions" but they cannot be considered win-win solutions by any measure.

On the other hand, other "safety measures" offered by Sangero, like improving the police lineup identification protocol⁴⁴ or recording lineups on video⁴⁵ – which will give the court a direct, full documentation of the evidence – will provide fact-finders better information about the nature of the specific eyewitness testimony laid before them, while leaving them full discretion about the weight of that piece of evidence and the ability to convict upon it. Under those restraints Sangero's theory can truly be considered a win-win improvement to evidence law.

⁴⁰ *Id.* at 217-9.

⁴¹ *Id.* at 228-32.

⁴² *Id.* at 181-5.

⁴³ *Id.* at 185-7.

⁴⁴ *Id.* at 187-8.

⁴⁵ *Id.* at 188.

Confessions

Nowadays it is widely accepted that a confession is no longer the "queen of evidence" and that false convictions may occur due to false confessions. But Sangero goes one step further when he claims that "Given this unequivocal evidence of numerous false convictions based on wrongful confessions given during police interrogations, I have suggested crowning this type of confession the 'empress of wrongful convictions' ".⁴⁶

Sangero bases his thesis on empirical studies (which supposedly prove the large prevalence of false confessions as a major cause for false convictions and the fact-finders' inability to discern true from false confessions) and on a Bayesian logic analysis. From that he concludes that "... legislators should amend current law to preclude confessions from being the sole, or key, piece of evidence for a conviction, and to assign them only corroborative weight, to support other key evidence in a case".⁴⁷ In the following paragraphs we would like to put that conclusion, and its underlying assumptions, to the test.

One of us and Shai Otzari have shown elsewhere that in order to prove that false confessions are more prevalent than fact-finders assume, and therefore cause more false convictions than should be expected by their proportionate share and by the criminal standard of proof, researchers should estimate the proportionate share of false convictions based on confessions from all convictions based on confessions.⁴⁸ None of the studies discussed by Sangero provides that datum.⁴⁹

Let's take for example the findings of studies conducted by the Innocence Project that about one-quarter (23 percent) of the first 225 cases in which DNA testing proved a conviction to be false had been based on (presumably false) confessions.⁵⁰ That datum, in itself, does not indicate whether confessions are more or less reliable than other kinds of evidence or whether false confessions are more prevalent than we should expect. Let's assume, for example, that 70 percent of all convictions are based on a confession as a primary evidence. If so, and if only 23 percent of false convictions are based on confessions, then we can

⁴⁶ *Id.* at 158.

⁴⁷ *Id.* at 179.

⁴⁸ Doron Menashe & Shai Otzari, "What is the Weight of a Confession?" – Rethinking the Bayesian Weight of Confessions – A Comment on Boaz Sangero & Mordechai Halpert Article, 27 BAR-ILAN L. STUDIES 503, 508 (2011) (in Hebrew).

⁴⁹ SANGERO, *supra* note 1, at 158.

⁵⁰ *Id.*

conclude that confessions are quite reliable, while other kinds of evidence are maybe overestimated.⁵¹

To prove the fact-finders' inability to discern true from false confessions, Sangero relies, among other studies, on the findings Richard A. Leo and Richard J. Ofshe who showed "... in a study of sixty false confessions, that 73 percent led to wrongful convictions" (meaning, 44 false convictions), and on similar findings by Stephan A. Drizin and Leo who showed "... that 86 percent of the 120 false confessions that went to trial led to wrongful conviction".⁵²

Once again, the missing datum is the total number of convictions based on a confession. If, for example, there were 4,400 conviction based on a confession in the relevant period, and the standard of proof was 0.99, then the expected value of false convictions should be indeed 44, as Leo and Ofshe had found out. That kind of finding, in the above-mentioned example, does not indicate that fact-finders are unable to discern true from false confessions, to an extant greater than is permitted by the proclaimed standard of proof.⁵³

As mentioned, the other argument of Sangero against the use of a confession as the sole, or key, piece of evidence for a conviction, is based on Bayesian calculation. Sangero uses Bayes' Theorem in an odds form:

Likelihood Ratio X Prior Odds = Posterior Odds

The Likelihood Ratio is the probability (P) of an interrogated suspect confessing if he is guilty ($P(E|G)$) divided by the probability of his confessing if he is innocent ($P(E|I)$); The Prior Odds is the probability of guilt divided by the probability of innocence ($P(G)/P(I)$) **without** taking the suspect's confession into account, based on other admissible evidence; and the Posterior Odds, which is what we are seeking in a criminal trial, represent the probability of guilt after taking into account both the weight of a confession and other evidence ($P(G|E)/P(I|E)$).⁵⁴

Based on the research and on the false confessions that have been exposed, and taking into account the impact of interrogation and detention conditions on suspects, Sangero assumes that at least one out of every ten innocent suspects will give a false confession during interrogation. He also assumes a 50 percent

⁵¹ Menashe & Otzari, *supra* note 48, at 510.

⁵² SANGERO, *supra* note 1, at 171.

⁵³ Menashe & Otzari, *supra* note 48, at 512.

⁵⁴ SANGERO, *supra* note 1, at 174-6.

probability of the court successfully discerning a false confession. Thus, the probability of a confession that is false and not being identified as such by the court is estimated by Sangero to be 5 percent ($P(E|I)=0.05$). The probability that a guilty person would confess is estimated by Sangero to be no greater than 50 percent ($P(E|I)=0.5$). Therefore, Sangero assumes that the Likelihood ratio is 10.⁵⁵

The Posterior Odds is also estimated by Sangero as 10 (which reflect a threshold of 90 percent that the defendant is guilty). Under those assumptions, the Prior Odds necessary to convict a defendant based on his confession must be at least 1, according the equation mentioned above (Bayes' Theorem in an odds form), meaning $P(G) \geq P(I)$. Thus, the probability of guilt based on incriminating evidence, but without a confession, must be at least 51 percent to satisfy the standard of proof of guilt beyond a reasonable doubt given a confession. Sangero derives from this that a confession should be treated like corroboration for other substantial incriminating evidence (if such exist) and should not be the primary evidence of guilt.⁵⁶

As one of us and Shai Otzari have shown elsewhere, the main problem with Sangero's argument is the ambiguity of the term "confession" which is used by Sangero in different contexts. As is known, there is a great variety of confessions: there are long and detailed confessions and there short and sketchy ones; there are confessions that are coherent and logical and there are confessions that are fairy stories; some confessions are given on the spot and some confessions are given after long days of interrogation; and so on.⁵⁷

It seems that Sangero uses for his Bayesian calculation the most meager form of a confession (a confession that includes only the words: "I confess") that was extracted after intensive questioning. Otherwise, it is hard to accept his assumption that one out of every ten innocent suspects will give a false confession during interrogation. If that is indeed the meaning of the term "confession" used by Sangero, then it's easy to understand why Sangero claims that a conviction should not be based on such a confession.⁵⁸

But if the confession has additional attributes, that have evidentiary value – like a detailed and logical confession, that includes information known only to the perpetrator, and was given during a peaceful and short interrogation – then those

⁵⁵ *Id.* at 177.

⁵⁶ *Id.* at 177-8.

⁵⁷ Menashe & Otzari, *supra* note 48, at 516-7.

⁵⁸ *Id.* at 518.

attributes should be taken into account in the Bayesian calculation, apart from the value of the words "I confess", as though they were separate pieces of evidence.⁵⁹

At this point it will be helpful to return to an example Sangero uses to illustrate the importance of the Prior Odds: "Assume that a crime was committed and that the person interrogated for committing the crime – not due to any evidence linking her to the specific crime... – has confessed. In her confession, the suspect did not provide any information not already know to the police or the public, and the police have not found any additional evidence tying her to the crime". Sangero uses Bayesian logic to prove that such a confession does not meet the criminal standard of proof.⁶⁰ But even without the use of Bayesian logic, a conviction that is based solely on a non-corroborated confession like that seems, intuitively, very unlikely.

However, as we have shown, that does not mean that all confessions have the same weight as a confession of a person that enters a police station and confesses, out of the blue, to a crime, without any motive and without any special knowledge about the way it was committed. In other words, we cannot deduce from the fact that some confessions should not be used as a sole, or key, piece of evidence for a conviction, that there are no confessions that can be used in that way.

Should a single piece of evidence be sufficient for a conviction

One of the major conclusions that Sangero draws from his Hidden Accidents Principle and his safety doctrine is that no conviction should be based on a single piece of evidence, just as a medical doctor should not base her diagnosis on a lone test without considering the statistical implications.⁶¹

Once again Sangero uses Bayes Theorem to illustrate his conclusion. The main point of his argument is that even if the likelihood ratio of a certain evidence, like DNA profiling, is very high, we must not neglect the Prior Odds which are extremely low (if there is no other evidence pointing to the defendant's guilt). After taking into account the Prior Odds according to Bayes Theorem it will be practically impossible to reach a Posterior Odds of 10, which reflect a threshold of 90 percent that the defendant is guilty.⁶²

⁵⁹ *Id.* at 518-9.

⁶⁰ SANGERO, *supra* note 1, at 173-4.

⁶¹ *Id.* at 57-65 *see also* Halpert & Sangero, *supra* note 2, at 415.

⁶² SANGERO, *supra* note 1, at 60-3.

As an opening remark, it should be noted that Sangero's suggestion that a single piece of evidence should not be sufficient for a conviction is phrased very widely, but in fact is applicable only to cases where the perpetrator of the crime is unknown. Only then the analogy between using a single piece of evidence to determine the identity of the preparator of a crime to a home HIV-testing kit (the analogy used by Sangero in his book)⁶³ can be considered. But in many criminal trials the perpetrator of the supposed crime is well known, and the question is whether the act was committed or whether that act constitutes an offence. Such is the case in most traffic offences, domestic violence, drug possession, tax evasion and many other offences.

In another part of his book Sangero illustrates how he thinks the Prior Odds should be calculated. He considers an example of a person who confesses to committing a crime after interrogation, although she was in police custody for a different crime, and there is no other evidence linking her to the confessed crime. If the crime was committed in a small city of 100,000 adults, Sangero argues that The Prior Odds is 1:100,000.⁶⁴

We think Sangero's assumptions about the prior odds ratio are unrealistic. The Prior Odds that a person interrogated by the police for committing a crime actually did that crime cannot exceed normally 1:10, and in very serious crimes 1:100. This assumption rests on the simple fact that the police do not have the personnel to interrogate so many suspects for every crime committed. To obtain a low Prior Odds which is necessary for the police work, the police screen out suspects by intelligence data, criminal records, polygraph tests and other methods.

But even if we examine Sangero's estimate of the Prior Odds under a moral restriction of using only admissible data, it still seems unrealistically high. We argue that it is not reasonable to assume that all the city's residents will be equally suspected for committing a specific crime in a specific place. For example, if a crime was committed in a certain school on a certain day, the "natural" suspects will be the small population of students, teachers and other professionals that worked in that school on that day. If another person will confess that he had committed that crime, without any evidence that he was in fact present at school while the crime was committed (like mobile phone tracking), the Prior Odds for that person will be indeed very low, and it's hard to imagine him being convicted for that crime when the sole piece of evidence is a sketchy confession.

⁶³ *Id.* at 58-60.

⁶⁴ *Id.* at 173-4.

But the main flaw in Sangero's argument originates from the conceptual confusion of using the term "evidence" in two different meanings. When the courts use the term "evidence" they use it according to the conventional and formal definition of the term in procedural law: evidence is a piece of information presented by a witness (hereafter: **evidence type 1**). However, the fact-finders can base their verdict on additional information which is circumstantially related to the main evidence; and for the Bayesian calculation, every piece of relevant information (that has a Likelihood Ratio other than 1) should be considered as a separate piece of evidence (hereafter: **evidence type 2**). Every evidence type 2 that is placed in Bayes Theorem will change, naturally, the Posterior Odds.

The following example will illustrate the difference between evidence type 1 and evidence type 2. A person is suspected for committing a crime, and the suspect is based solely on a DNA evidence (evidence type 1). In addition, we will assume, like Sangero, that the Prior Odds are extremely low, meaning that the suspect was not part of the community where the crime was committed. No matter what the suspect chooses to do in his interrogation and during his trial (if indicted), there will always be evidence type 2 that should be considered in the Bayesian calculation. Some examples for evidence type 2 in that scenario can be: a) The suspect's inability to explain what he was doing near the crime scene; or b) A decision of the suspect to invoke the right to remain silent; c) The answers given by the laboratory witness during her cross examination; d) A decision of the defendant not to conduct (or not to reveal) a private laboratory test to the DNA sample; etc. All of these will affect the Posterior Odds.

In conclusion, we have shown that there are two meanings for the term "evidence" in Sangero's argument, and that there is no reason to disallow fact-finders to base their conviction on "a single piece of evidence" in the conventional meaning, because that evidence will never be "single" in the Bayesian meaning (there will always be additional circumstantial information that will change the Posterior Odds). Moreover, we have shown that Sangero's estimate of the Prior Odds is unrealistically low and that his argument, to begin with, is only applicable to cases where the perpetrator of the crime is unknown.

The implementation of the STAMP safety model

It's impossible to review all of Sangero's innovative suggestions in this short article, so we decided to mention one last issue which is introduced for the first time in Sangero's book: implementing the STAMP (System Theoretic Accident

Model and Processes) model in the criminal justice system, and particularly upon confessions and plea bargains.⁶⁵

Sangero claims that one of the most prominent safety models today is the STAMP model, which was designed by Nancy Leveson from MIT, who serves, among other things, as a consultant to NASA, and is considered as one of the great experts in her field. In her latest book "Engineering a Safer World" she develops a general safety theory which can be implemented on every system.

Leveson argues that the traditional safety methods are not satisfactory for complex systems that use software and for dealing with human errors. Therefore, she suggests to shift the focus from the reliability of every component in the system to the control of the system's safety as a whole. In her opinion, we should examine thoroughly the system in order to place constraints on the system that will secure its operation without accidents. For example, one of the constraints necessary for the secure operation of a subway or metro system is that the doors will open only after the complete stop of the train, unless an emergency happens. In the second stage, we should set controls that will impose the safety constraints on the system.

According to the STAMP model, accidents happen due to lack of control over the system, which means that there weren't enough constraints over the system in every stage of its development and operation. In her book "Engineering a Safer World" Leveson shows that the STAMP model was tested successfully in a number of deferent systems and proven effective and efficient, both in investigating accidents and in designing systems' safety in advance. The STAMP model uses a risk assessment method, that simulates an investigation of a hypothetic accident. The STAMP model was originally developed for technical systems, but it should work fine, according to Leveson, on human systems as well, like hospitals.

Sangero's idea is to implement the STAMP model on every stage and on every agent involved in the criminal justice process. Sangero uses confessions and plea bargains as illustrations for the ways in which the STAMP model could be implemented in the criminal justice system. It should be noted though that according to Sangero's theory this implementation should be governed in the future by the SCJSI.

⁶⁵ *Id.* at 50-2 (general introduction to the STAMP model), at 90-6 (implementation of the model on confession) and at 220-1 (implementation of the model on plea bargains).

As to confessions, Sangero points out to four dangers: 1. An investigation that leads to false confession; 2. A plea bargain that leads to false confession; 3. A false confession that the court finds admissible; 4. An innocent defendant that is convicted due to a false confession ("an accident"). For each danger Sangero offers constraints that should be imposed on the system to reduce the danger. For example, in order to reduce the danger of false confessions, Sangero suggests forbidding any physical or psychological pressure on the suspect during the interrogation, such as lying to the suspect or threatening him in any way or using prolonged interrogations. The controls that can be used to impose those constraints are videotaping the whole interrogation, allowing a defense attorney to be present in the interrogation as an observer, widening the inadmissibility rules, etc.⁶⁶

To the best of our knowledge, this is the most elaborate attempt yet to introduce a comprehensive theory of safety in the criminal justice system. This attempt is very worthy and one should hope for it to be continued. Nevertheless, in our opinion some of the constraints Sangero wishes to impose on the criminal justice system are overwhelming and exaggerated in a way that can undermine the law and order function of the criminal justice system, as mentioned above.

Summary

The book "Safety from False Convictions" embodies Boaz Sangero's innovative idea, that was originally conceived together with Mordechai Halpert, to implement tools from the field of safety management to the field of criminal law, which he views as a "safety-critical system". In safety-critical systems, like aviation, every accident could result in catastrophic damage, especially the loss of life. Sangero views a false conviction as such a catastrophic "accident" of criminal law.

A wide theory like that is bound to attract a lot of criticism and spark an academic discourse. In our humble contribution to that discourse we argued that there are three basic problems in Sangero's theory. The first problem is that, at the end of the day, most of Sangero's theory is a "rules theory", and like other "rules theories" it has trouble to set criteria for a legitimate level of risk for false convictions. The second basic problem is that Sangero's estimate of the false conviction rate, which is a central assumption needed for his thesis, is not well-founded. The third basic problem is that Sangero's theory cannot be considered a win-win solution in a broad sense, because in most cases it will "safety procedures" will increase the risk of wrongful acquittals.

⁶⁶ *Id.* at 94-6.

After examining those three fundamental problems in Sangero's theory, we examined more closely three of his specific suggestions, that two of them seemed problematic to us. In contrast to Sangero, we showed why a confession can be considered as a key piece of evidence for a conviction in some cases, and more generally, why "a single piece of evidence" (in the courts' conventional meaning) can be sufficient for a conviction. As to his suggestion to introduce the STAMP safety model to the criminal justice system, we thought that it was a fascinating suggestion that is worth a further discussion and development.

Having said that, we think some of Sangero's ideas, especially in the field of forensic sciences, should be considered seriously by policymakers. Some of these suggestions can reduce false conviction rate with minimal cost or with no cost at all, and without changing the current risk allocation in criminal trials. Additionally, many other ideas mentioned by Sangero in his new book deserve to be the subject of future academic discourse.