

The Calculation of Illicit Profit in US Insider Trading Cases

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Abstract

In the US, there are currently three different approaches, the net profit, the notional profit/market absorption, and the event studies approach, taken by the circuit courts and district courts in calculating illicit profit in insider trading cases. Such non-uniform approach has created opportunities for defendants to argue for the approach that is best to their advantage, thereby reducing sentencing. This paper evaluates the three different approaches from their legal interpretation and justification, expected harshness and standard deviation on sentencing, as well as transaction cost. The net profit approach, which is favored by government agency, has many drawbacks as it suffers from inconsistency, harsh and uncertain expected sentence. A jurisdiction is better off if it decides between market absorption and event studies approach.

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In the US, there are currently divergent approaches in calculating illicit profit in insider trading cases. What constitutes 'profit' differs from case to case and the legal doctrine in this area is far from consistent as different court decisions confront each other. Basically, there are three major approaches that have been adopted at the US circuit courts and district courts: the net profit, the notional profit (also known as market absorption), and the event studies approach, a three-way division that surged in the case of *United States v. Nacchio* [1]. Because different amount of illicit profit will translate to different level increase of sentencing based on US Sentencing Guidelines¹, the divergent approaches taken by courts could create problem of similar criminal conduct facing different sentences. As stressed by the dissent opinion of Judge Bright in *United States v. Mooney* [2], 'I urge the Supreme Court to resolve the circuits' split on this issue, to eliminate the geographic crazy quilt by which many criminal defendants, sentenced for similar conduct and crimes, receive dissimilar appellate treatment under Booker² and, in many cases, disparate sentences³.

This paper sets out the justification of each approach and discusses their likely pitfalls. The next three sections evaluate the legal interpretation, justification and criticism surrounding net profit approach, notional profit approach and event studies approach, respectively. After that, a simple simulation model is presented for overall comparison of the three different approaches in terms of expected harshness and uncertainties on sentencing. The simulation model further illustrates the problems of non-uniform approach: it essentially allows the defendant to argue and shop for his most favorable approach, i.e. sentencing at la carte. The end result will be a much more leniency on sentencing. Finally, the conclusion section discusses the possibility of a uniform approach and provides the suggestions.

Net profit approach: the defendant's realized gain

According to 2011 US Sentencing Guideline Commentary 2(B) 1.4, 'See page 1067-1068 of *Nacchio* for the base level and its increase in insider trading cases.

¹United States v Booker, 543 U.S. 220, 125 S.Ct 738 160 L.Ed.2d 621 [2005].

²Page 1105 of *Mooney* [2005].

³Page 1100 of *Mooney* [2005].

⁴Page 52 of *SEC v MacDonald* 699 F.2d [1983].

⁵Page 1107 of *Mooney* [2005].

⁶Page 1106-1107 of *Mooney* [2005].

⁷Page 1068 of *Nacchio* [2009].

the basis for setting illicit profit in insider trading case is: 'the gain, i.e., the total increase in value realized through trading in securities.' This constituted the legal base of majority decision [2]. According to the majority, 'by use of the word realized, the commentary makes clear that gain is the total profit actually made from a defendant's illegal securities transactions⁴. Problem often occurs when the defendant did not sell immediately after the announcement of private information and stock prices surge, plunge, or fluctuate a while after that announcement. Especially in cases when market surges after the announcement of non public information, government often stands ready to take away those 'ill-gotten gains' as it would appear inequitable to allow the defendant to retain his illicit gains⁵. However, in criminal cases, the key issue is that these illicit gains will be translated to level increase in sentencing. Thus, one who is blessed most by luck in the market will end up being most cursed in jail terms once he or she is convicted, as demonstrated by Judge Bright's vivid illustration⁶ because his or her level increase over the base offense will be higher than someone who is cursed by the market. Overall, such approach 'could result in unequal sentences for equal crimes'⁷.

The defendant's sense of injustice would be especially strong in option cases like [1], where call options were granted as managerial incentives for CEO performance and stock prices surge prior to the possession of inside information. As Mr. Nacchio argued that 'to include for sentencing purposes the total amount he made on stock sales as gain is punishing him for "the normal appreciation in Qwest's shares from 1997 to 2001, which has nothing to do with the offense charged"⁸.

According to the defendant, Mr. Rajaratnam, [3] such typical method used by US government agency suffered from two drawbacks, not just one: first, as already mentioned, there will be improper inclusion of movement in stock prices that occur after the announcement of inside information. Second, on top of that, there will also be improper inclusion of movement in stock prices that occur prior to

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the announcement of inside information. The appropriate approach of dealing with both drawbacks, as claimed by Mr. Rajaratnam, is to rely on event studies done by economist, Dr. Gregg Jarrell. Mr. Nacchio also advanced the calculations through event studies done by Professor Daniel Fischel as the correct basis for his level increase [1]. Event studies are statistical technique developed by financial economists and are especially useful in their application to fraud cases because they 'allow the investigator to discern whether information that is used in an alleged fraudulent action is important to investigators and to determine the value of the information'⁹.

In addition to the improper inclusion of movement in stock prices, this method also suffers from another additional drawback, the logical inconsistency with respect to long and short positions. In cases where holders of inside information sell in face of a negative public announcement, the calculation of loss avoided would eventually have to be based on a market price benchmark, which is the underlying rationale of notional profit approach discussed in the next section. Thus, the internal logic of this approach appears to be a hybrid one. It calculates profits from long positions as actual net profit, while calculating profits from short positions by referring to market benchmark. Such hybrid approach was taken by the government agency in [3] because the fact pattern in that case involved long as well as short positions. Under such scenario, the logical inconsistency of net profit approach is more than apparent, and that is perhaps one of the underlying reasons the district court in [3] rejected the government approach and resorted to market absorption approach.

However, the net profit approach is straightforward in its application as it involves minimum technicality. According to the majority in [2], "the use of actual sales to calculate gain provides a clear and coherent bright-line rule, eliminating the need for extensive fact-finding to try to determine when the market has absorbed nonpublic information." In addition, it sidesteps some possible outcomes that the defendant wins big in case where he does not sell immediately after the release of private information and market surges afterwards. Such outcome could appear unfair in the eye of the public. Thus, the attractiveness of such approach actually lies in its appealing to fairness in an ex post sense. Such approach finds favor in government agency because of its minimal technicality as well as its appealing to fairness.

Notional profit: the market absorption approach

The notional approach is the baseline approach in Asian jurisdictions such as Hong Kong. In *The Insider Dealing Tribunal v. Shek Mei Ling* [4], Lord Nicholls of Birkenhead, stated in the judgment, 'the approach is to treat the relevant profit as that gained by the insider dealer when the information was made public and the market had had a reasonable opportunity to digest the information. The gain is to be measured by reference to the market value of the shares at that date. At that date, the amount of the insider dealer's profit, whether realized or not, was fixed once and for all. Subsequent changes in market prices are irrelevant'. This approach has been followed in Hong Kong case [5]. In Hong Kong, the sentencing guideline is based on two Court of Appeals decisions [6,7], which adopted and modified the guideline provided in UK case [8].

⁹See page 546 of Mitchell and Netter (1994).

¹⁰The disgorgement approach and the market absorption approach are the same in terms of their technical implementation, i.e. fixing the market absorption date. However, the disgorgement approach has been broadened by Nacchio [2009] to encompass the event studies approach.

¹¹See page 1078 of Nacchio [2009] and page 55 of MacDonald [1983].

¹²Page 1105 of Mooney [2005].

The same approach has been taken in US case, [3]. This is also referred as 'market absorption' approach because it suggests that gains from inside information will be absorbed by the market after a market absorption date. The legal interpretation and justification of the market absorption approach is derived from its broader version, the disgorgement approach, which will be discussed in the next section¹⁰. One obvious justification of this approach is that it deals away with the improper inclusion of movement in stock prices that occur after the announcement of inside information. However, the improper inclusion of movement in stock prices that occur before the announcement of inside information is not taken out even after the fixing of the market absorption date.

Technically, it is relatively easier to deal with the first drawback than the second one because the market price after the public announcement of private information can be pinpointed by simply referring to the market absorption date after the announcement without resorting to a fully fledged regression analysis. That is possibly one underlying reason that most courts deal with this drawback while ignoring the other. In contrast to the net profit approach, it is not as straightforward as it might still present difficulty for someone without technical assistance. In civil case [9], for example, 'the court provided the district court a formula for analyzing this market absorption date: in determining what was a reasonable time after the inside information had been generally disseminated, the court should consider the volume and price at which [the] shares were traded following disclosure, insofar as they suggested the date by which the news had been fully digested and acted upon by investors'¹¹.

The market absorption approach represents a 'half way through' approach that lies in between the net profit approach and the event studies approach. It disentangles the improper inclusion movement in stock prices that occur after the announcement of inside information but fails to deal with improper inclusion movement in stock prices before the market absorption date. A pitfall of such 'half way through' approach lies in the danger of digging its own grave. Any criticism that is addressed to the net profit approach for failing to isolate improper inclusion of movement in stock prices can be readily deemed as an criticism of itself because such approach fails to do a clean job, after all. The same sort of problem also occurs in the hybrid approach that involves long and short positions. Perhaps that is the underlying reason that the Tenth Circuit Court [1] decided to include the event studies as a possibility under the umbrella of a broaden category, i.e. the disgorgement approach. The legal justification of market absorption approach is discussed in the next section under the disgorgement approach, which is addressed in contemplation of the inappropriateness of the net profit approach.

Disgorgement approach and event studies approach: isolating the impact of inside information as much as possible

The starting point of legal justification of disgorgement approach lies in its stress on the interpretation of The US Sentencing Guideline. "We must know what "the offense" is, because the guideline does not look to "gain" simply, but to "gain resulting from the offense." Indeed, simply to take the definition of "gain" without limiting it to "gain resulting from the offense" would lead to absurd results. It is not all the defendant's stock gains-over an entire lifetime of a stock trading, perhaps-that counts, but only the stock gains "resulting from the offense"¹². Such legal interpretation is further reinforced by referring to relevant statutes. According to FN 10. 15 U.S.C. § 78j, which states: It shall be unlawful for any person, directly or indirectly b) "To use or employ, in connection with the purchase or sale of any security ...

any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe ...¹³. Based on the plain language of the statute, ‘the offense is not the purchase, but the deception. The “gain resulting from the offense” is not the gain resulting from the purchase. It is rather the gain resulting from the deception¹⁴. On its surface, there is not much difference between disgorgement and market absorption approach in terms of their technical implementation. However, such interpretation by the dissent of [2] was relied on, developed and tilted in [1] that its scope of application became wider.

The disgorgement approach also ‘seek(s) guidance from civil jurisprudence in performing the criminal sentencing function’ and such reference is considered as appropriate by Nacchio¹⁵. The formulation of disgorgement approach was shaped in [9] as it argued against ignorance of the cut-off date: ‘we see no legal or equitable difference... between an insider’s decision to retain his original investment with the hope of profit and a decision to sell it and invest in something else. In both cases the subsequent profits are purely new matter. There should be a cut-off date¹⁶. Overall, the disgorgement approach is predominately concerned with fixing the date of market absorption. Interestingly, the Tenth Circuit Court in Nacchio [1] appeared to ignore the inherent differences between disgorgement and event studies approach and classified the event studies as one variant under the umbrella of disgorgement approach. ‘We appropriately leave it to the district court in the first instance to determine the extent to which such (event studies) analysis comports with the disgorgement approach adopted here¹⁷. Thus, event studies and market absorption, while heterogeneous in nature in terms of their technical implementations, were incorporated under the disgorgement approach in [1] and were underpinned by the same source of legal interpretation.

Event studies is probably the most technical approach as it seeks to isolate the impact of inside information from other market factors because a genuine event studies approach would require regression analysis done by economists. To strike a balance, ‘the court’s focus should be on ensuring that the gain figure resulting from the offense excludes to the extent possible, within the institutional constraints of criminal sentencing, factors unrelated to the defendant’s criminally culpable conduct¹⁸. Obviously, the Tenth Circuit Court was concerned with the higher transaction cost involved in event studies approach, and in the event of discrepancies that arise among experts; the court probably will side with the government expert.

The Tenth Circuit Court’s [1] decision was much criticized by the district court of Rajaratnam [3]. In its opinion, such approach should be confined within fraudulent cases and should not extend towards the domain of insider trading cases. According to the district court, ‘there is an important difference between fraudulent misrepresentation and insider trading cases: the insider does not cause the price of a company’s stock to move¹⁹. The district court took the view that inside trader took a passive role with the information, in contrast to fraudulent cases, where the defendant played an active role with such information. Thus,

‘when the rise or decline in the price of a stock in response to a public announcement does not result from any action of the defendant giving rise to the offense, it is hard to say that a defendant’s gain from the rise or decline is a “gain resulting from the offense” of insider trading²⁰. Here, in order to distinguish cases of fraudulent misrepresentation, ‘resulting’ has been interpreted in relation to whether the defendant affects the stock movement. However, it really goes a long way to associate terms as general as ‘resulting’ and as specific as ‘cause the price of a company’s stock to move.’ The force of such interpretation is not as solid as the interpretation discussed in [1], which is supported by the Guideline itself as well as relevant statutes. In addition, it is difficult to see why defendants would cause stock prices to move in misrepresentation fraudulent cases and not in insider trading cases. After all, price movements will depend on the market depth, market psychology and other fundamental factors of any given stock, and any of which could have complicate and intricate interplays with the non public information.

Noting the reliance of disgorgement approach on civil jurisprudence, the majority in [2], which favored the net profit approach, distinguished it and pointed out ‘in explaining what is meant by the defendant’s gain and why it is used for sentencing inside trading offenses, the commentary specifically rejects using victim losses in the calculation. The guideline employs the concepts of gain resulting from the offense as an alternative measure of loss because of the difficulty of ascertaining the victims and their losses for such offenses²¹.

In sum, the criticism of the expanded disgorgement approach by Nacchio [1] has been forwarded on two fronts. It is considered too broad by courts that adopted market absorption approach, and rejected by courts that favored net profit approach. On the one hand, the district court in [3] adopted the market absorption approach and sought to distinguish it from fraudulent misrepresentation cases. On the other hand, the majority in [2] adopted the net profit approach and sought to deny the appropriateness on relying on civil jurisprudence. In the end, both criticisms do not directly confront the additional drawback as claimed by Mr. Rajaratnam.

A simple simulation model

Assume there are two periods, 1 and 2. Agent purchases one unit of stock at the beginning of period 1 with the knowledge of inside information that the stock is going to go up. The inside information realizes at the end of period 1, however, the agent holds on the stock for another period and sells it at the end of period 2. A stochastic event occurs at the end of period 1 and 2 and the two events are independent of each other. The independence assumption is appropriate in that stock prices are normally deemed as following a random walk, a natural consequence of the efficient market hypothesis [10,11]. The illicit profit of this agent can be represented by the following equation:

$$Y = \theta_1 + X_1 + X_2 \quad (1)$$

where Y denotes the accumulated profit in terms of dollar value from both periods, and X_1 and X_2 are random variables that represent the dollar value of profit occurring at the end of period 1 and 2, respectively. X_1 and X_2 are independently and identically distributed, while θ_1 stands for the dollar value of inside information that will be paid out at the end of period 1²². Further assume that stochastic events follow a Bernoulli distribution with 0.5 of probability that stock prices surge due to good news and 0.5 of probability that bad news hits the stock prices. The realization of good news will create a \$1 payoff for the agent, while the impact of bad news will decrease his payoff by \$1. The payoff from inside information is \$1, i.e. $\theta_1 = 1$. This simple model

¹³See also page 1106 of Mooney [2005].

¹⁴Page 1106 of Mooney [2005].

¹⁵Page 1079 of Nacchio [2009].

¹⁶Page 54 of MacDonald [1983].

¹⁷Page 1080 of Nacchio [2009].

¹⁸Page 1086 of Nacchio [2009].

¹⁹Page 5 of Rajaratnam [2012].

²⁰Page 7 of Rajaratnam [2012].

²¹Page 1100 of Mooney [2005].

²²For simplicity, θ_1 is assumed to be a constant. Alternatively, one could formulate the payoff from inside information as a random variable.

	Probability	Payoff	Net Profit	Market Absorption	Event Studies	Defendant's Favored Approach
1	0.25	3	3	2	1	1
2	0.25	1	1	2	1	1
3	0.25	1	1	0	1	0
4	0.25	-1	0	0	1	0
Expected Illicit Profit			1.25	1	1	0.5

Table 1: Expected Illicit Profit under Different Approaches [23].

illustrates the payoff under four different scenarios and compares the agent's expected illicit profit as calculated under net profit, market absorption, and event studies approach. Let scenario 1 denotes good news in both periods, scenario 2 denotes good news followed by bad news, scenario 3 denotes bad news followed by good news, and scenario 4 denotes bad news in both periods. Table 1²³ illustrates the illicit profit in each scenario under different approaches. The payoff under scenario 1 is \$3 because there will be \$1 from inside information and \$2 from two periods of good news. The payoff under scenario 2 and 3 are the same because good news and bad news cancel out each other and the agent is left with \$1, i.e. the value of the inside information. Under scenario 4, the payoff is -\$1 because there will be \$1 from inside information and -\$2 from two periods of bad news. The probability of each scenario is 0.25.

The expected illicit profit calculated under net profit, market absorption and event studies are 1.25, 1 and 1 respectively. Thus, in terms of the expected illicit profit, its value is highest under the net profit approach. That probably explains why the government agency likes it most and the defendant almost always argues against it. Market absorption could be harsh on defendant if defendant is cursed with bad news on the second period, such as scenario 2. That is close to the fact pattern in a Hong Kong case, where the defendant only realized profit of about HK\$ 2 million [5]. Based on the calculation of notional profit, the fine was estimated to be about HK\$ 23 million²⁴. In the US, such scenario also occurred in SEC v. Shapiro [12], and the illicit profit was calculated in the same manner.

The event studies approach is not especially lenient in itself when compared with market absorption as they are equal in terms of expected illicit profit. It only appears lenient in an ex post sense, i.e., when the defendant is blessed by first period good news under scenario 1 and 2. Scenario 1 is close to the fact pattern in [3], and the defendant would naturally feel that calculation under net profit approach is unfair to him. However, the expected illicit profit under event studies could possibly be the lowest given that the government always likes to adopt the net profit approach. Thus, under scenario 4, the defendant, instead of proposing the event studies approach, would not argue against the net profit approach taken by the government, and the illicit profit would end up being zero instead of 1. In addition, under scenario 3, the defendant is likely to argue for market absorption instead of event studies approach. In sum, the availability of event studies approach means additional option, i.e. rooms to maneuver, for the defendant. Such a favored approach taken by the defendant will end up being most lenient, as its expected illicit profit is reduced to only 0.5. This is very

likely to be what is occurring in the US now given the chaos that has been created by non-uniform approach.

Another problem suggested by Table 1 is the standard deviation, which measures the fluctuation on sentencing in terms of deviation from the mean. The standard deviation would be a negative indicator because it suggests the degree that sentencing would be influenced by the luck factor, i.e., the uncertainty. Clearly, the standard deviation under event studies is zero because, at least in theory, it never fluctuates. Although in practice, experts might disagree with the value of parameters chosen in running the regression, the appropriate statistical techniques, and so on. Although discrepancy in expert opinions could still rise, any such discrepancy should presumably lie within a more confined scope. Without going into detailed calculation, simply by inspection, the standard deviation is largest in the net profit approach, followed by market absorption, which is then followed by the favored approach taken by the defendant.

The real problem of event studies approach lies in its leniency in an ex post sense. One wonders if the court would really accept the facts under scenario 1 and 2 that the illicit profit actually should be lower. Especially under scenario 1, the illicit profit is not only lower, but much lower than actual profit. In real world situations, that would create difficulty for the application of event studies approach because the inequity embedded under such scenario is more than apparent.

However, one should really question whether it is right to base legal decision on realized outcome given that legal doctrine elsewhere is mostly based on ex ante, i.e., expected probability. For example, in tort law, the 'but for' test is based on expected probability. The 'but for' test is not dependant on whether the harm is actually caused by the defendant but instead runs the psychological simulation and ask but for the defendant's conduct would the plaintiff have suffered the harm. Similarly, in criminal law, the definition of foresight in murder cases involves the ex ante view of probability, rather than the actual realized outcome.

A consistent approach?

Having discussed the pitfalls of each approach, it would be quite a challenge to choose the lesser evil. The net profit approach taken by most government agencies in insider trading cases is vested with logical inconsistencies. It is especially problematic in option cases and cases that include both long and short positions. It also generates most harsh sentencing on defendants with great uncertainties as the fluctuation in sentencing from case to case is the largest among all approaches. Its appeal to justice is weakened once one realizes that it is justice in an ex post sense. Unless the court likes to take a cocktail approach that applies different approaches to specific fact patterns and restricts its usage under certain scenarios, it should probably be forsaken. A cocktail approach will be difficult to justify itself given the mutually conflicting nature of different approaches. Worst of all would be the current chaos which allows the defendant to shop for the most favorable approach, depending on the facts of each case.

Thus, it would be much better if the court can stick to a uniform approach and maintain some consistency. There are two better choices, either market absorption or event studies approach. They are equivalent in term of expected harshness on sentencing, however, the event studies approach edges out in minimizing the standard deviation of sentencing. Among conflicting legal arguments, the Nacchio [1] actually excels in its rigor of legal argument and thus event studies would be one top choice. However, the transaction cost involved in event studies approach is larger because it normally involved hiring an

²³The net profit approach calculates gain base on the realized gain and under scenario 4, there is nothing left. The market absorption approach counts only the first period payoff and completely ignores the second period payoff. The event studies approach measures the value of inside information, while ignoring payoff from other market factors. The payoff of favored approach is equal to the minimum of all three approaches.

²⁴See paragraph 17, 18 and 32 of HKSAR v Du Jun.

expert in economics and finance. If event studies approach is to be the choice, one should find ways to minimize the transaction cost. It would be less controversial if such approach is actually taken by government agency and apply to everyone on equal footing. Given that the net profit approach is often severely challenged in courts and the courts might actually reject it, it would be a good idea that government agency freelances with some econometricians, thereby contributing to the consistency in insider trading cases.

Market absorption is not a bad choice as well as it is much easier to implement than the event studies approach. However, if market absorption is to be the choice, the court will need to be careful in its legal argument in distinguishing it from the event studies approach, which is likely to be presented by defendants under certain circumstances. Transaction cost appears to be a good argument against the event studies approach. In addition, event studies approach is especially likely to be utilized by ultra 'big fishes' on Wall Street because they can afford it. Event studies are less likely to be proposed by a 'small fish' of the finance world such as the defendant in Du Jun [5], a rank and file employee rather than CEO. On the one hand, the profit derived from insider trading from such person is likely to be smaller due to smaller initial investment. On the other hand, their skill is probably not as swift, thus they are more likely to be swallowed by subsequent random factors on the market. After all, they are not CEOs and do not have as good an access to frontline information all the time. Either way or both ways, their pockets are not as deep as the standard size 'big fishes' on Wall Street, such as the defendant in Nacchio [1] and Rajaratnam

[3], and the event studies approach would appear less accessible to them. Thus, if event studies approach is placed under the disgorgement approach as suggested by Nacchio [1], it could provide a way for the super rich to buy their discount on sentencing. The bottom line is: if the court decides to stick to market absorption approach, it should forsake the event studies approach altogether. That is exactly what Rajaratnam [3] has done, and it is likely that they were doing the right thing.

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