GRADE EXPECTATIONS

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ABSTRACT

Students perceive economics principles courses to be difficult, yet they expect to do relatively well in these courses. For example, a majority of students responding to a survey administered in economics principles courses believed economics to be relatively difficult. In spite of this, these students expected to receive a grade of at least 3.0 in these courses. Two sources - overly optimistic expectations and signaling – may explain these unrealistic expectations.

This paper uses survey data in an attempt to establish whether over-optimism or signaling can help explain the aforementioned student behavior. This is important because the underlying cause of grade overestimation has implications for professor response to this behavior and for student performance in the course.

The results of an ordered probit model indicate that student grade prediction in these courses is driven by overly optimistic expectations and by signaling. Thus, we conclude that policies designed to bring student perceptions into line with reasonable performance expectations should be coupled with efforts to provide instructors with more information about individual student ability. This will help maximize student performance in the course and will also prevent lowering of grading standards on the basis of false signals.

INTRODUCTION

Behavioral economics departs from the typical assumption of unbounded rational behavior on the part of economic agents. Instead it allows for the fact that people often behave irrationally both in terms of the beliefs they hold and the judgments they make. Although psychology literature has long discussed this attribute of behavior, Simon (1955) was one of the first to introduce the idea to the field of economics.

Psychology literature argues that individuals in Western culture tend to be overly optimistic when stating their aspirations and expectations. Lewin et al (1944,

p. 337) argues that people in Western culture typically express aspiration levels above their previous performance levels when first exposed to a situation and, under most conditions, continue to express positive goal discrepancy. While cultural pressures for improvement can stimulate people to greater effort, such pressures can have negative impacts. March and Simon (1958, p. 263) argue that not only are aspirations revised downward in the face of positive goal discrepancy, but such discrepancy may result in feelings of apathy and trigger search behavior as individuals look for alternative ways to fulfill their goals. Cross (1969) went on to postulate that individuals who are overly optimistic in their demands may actually end up with a lower payoff than those whose initial demands are more realistic.

These ideas can be applied to student behavior. Students who are overly optimistic with regards to their grade expectations and set their goals too high may become discouraged and put forth less effort in a class. In this case, over-optimism may result in a relatively worse course grade. In addition, the search behavior described by Simon may result in signaling on the part of poorer students. Such activity may make it more difficult for an instructor to award grades that accurately reflect student knowledge and ability. Thus, overly optimistic grade expectations on the part of students can have implications for the grades ultimately awarded in a course and can therefore have implications for instructor response to this behavior.

Our paper uses data collected from students enrolled in economics principles courses to examine the question of over-optimism on the part of students. The following section discusses the responses to a survey administered to students enrolled in beginning macroeconomics and microeconomics courses at a Midwestern university. These responses are related to the behavioral economic postulate of unbounded rationality and to signaling behavior. This is followed by the results of statistical analysis of the survey data. Finally, we conclude with thoughts on how instructors might respond when student over-optimism and signaling occur.

BACKGROUND

We use data from a survey administered to over 400 students enrolled in principles of economics classes at a Midwestern university and data from one of the University's databases to collect information on student grade aspirations, expectations, and abilities. Our data indicate that the students enrolled in these principles courses not only aspired to, but expected to earn a grade between an A and a B for the course. In fact, only one of the students surveyed expected to earn

below a C in the class. Considering that as a group these students had an undergraduate GPA of 2.80, there appears to be evidence for the hypothesis of over-optimism on the part of students. This hypothesis is further supported by the fact that nearly sixty percent of the students surveyed believed that economics was harder than a typical class, data consistent with previous research that has shown economics to be a "low-grading" class (Sabot and Wakeman-Linn, 1991).

As previously stated, over-optimism can affect a student's grade in two ways. First, when performance is well below what is expected, a student may become discouraged and decrease his effort to such an extent that his course grade falls below what would have been earned in the face of more realistic expectations. Secondly, poorer students may engage in signaling behavior that can make it difficult for the instructor to distinguish better students from poorer students. Assigning grades that accurately reflect student ability and mastery of course knowledge can become problematic for an instructor.

Following earlier psychology literature, March and Simon (1958) discussed the fact that aspirations are adjusted downward when goals are not attained. Under certain circumstances apathy (or aggression) may ensue. Building on the earlier behavioral theory, Cross (1969) discussed inflated demands and the impact they may have on the bargaining process and its final outcome.

While it is obvious that instructors and students are not bargaining over grades, Cross's argument as to how overly optimistic expectations can impact the outcome of a situation can certainly be applied to the classroom. Cross reaches the conclusion that, in general, overstating demands or expectations will not improve the payoff of the final outcome of a situation. In fact, inflating initial demands or expectations may worsen the final outcome. This is because Cross views the final outcome as a positive function of the rate at which the opponent concedes (makes downward revisions in demands or expectations). If a high initial demand or expectation causes one of the parties to concede at a greater rate, their final outcomes will be worse than what it would have been if more realistic goals had been set.

Note how the outcome of Cross's model can be applied to students. If students are initially overly optimistic in their expectations, they could end up in a worse position than if their expectations more closely matched the actual outcome. If students' aspirations exceed their performance, motivation and effort may fall. As effort decreases, students' academic performance will deteriorate.

High initial expectations can also be linked to signaling theory developed by Akerlof (1970) and Spence (1973). In this instance students may deliberately

misrepresent their expectations as part of a strategy to improve the grade they are assigned by the instructor. Consider the following: A professor has just completed grading a midterm or final exam and is puzzled by the results. Several of her "better" students did not do well on the exam. These are students who regularly attend class, take notes, appear interested in the material, ask clarifying questions, participate in group projects, and turn in homework assignments on time. She asks herself the following: Did she present the material in a way accessible to her students? Was the exam too difficult? Should she grade the exam on a curve?

What may not occur to the professor is that the last question is exactly what these "better" students are hoping for. If a college student is enrolled in a class in which he believes that, despite his best efforts, it will be difficult to earn a good grade, the student can accept a poor grade, drop the course, or perhaps attempt to convince the instructor that he is a good student. If this later strategy is successful, the instructor may question the efficacy of her teaching methods and lower grading standards. Thus, expressing high grade expectations may be part of a strategy designed to convince an instructor that the student is capable of doing well in the course. In this instance, mimicking better students may allow a less able student to obtain a higher grade in the course. Alvarez and Adelman (1986) take up this theme when they argue that students tend to inaccurately predict grades because of "self-protective" behavior. In other words, students may over estimate their performance in order to present what they call a "facade of competence."

The ability of a student to signal requires the existence of asymmetric information. Students enter college with a variety of abilities. The mean and variance of these abilities are a function of several things including the selection criteria of the college or university. Students, based on their prior academic experience, are likely quite aware of their abilities. While several indicators of ability (e.g. SAT/ACT scores, high school grade point average, etc.) are often available to college or university officials, individual instructors do not typically avail themselves of this information. Thus, the usual case is that the student is aware of his/her abilities while the instructor may know only about the probability distribution of the students in the university. We used a variation of Gardner's (1995) Caveat Emptor game to model this situation. In an appendix available from the authors, we show that both pure strategy and mixed strategy equilibriums are consistent with instructors assigning higher grades to weaker students than would otherwise be assigned.

The following section begins by discussing the survey and University data used to estimate an ordered probit model of student grade aspirations and

expectations. We conclude with a discussion of the empirical results of the model and explain how these results may be indicative of student signaling.

EMPIRICAL RESULTS

In this study we are trying to understand why a majority of students enrolled in introductory economics classes expect to receive a higher grade in the course than the one they eventually earn. Survey responses from over 400 students enrolled in these courses (both macroeconomics principles and microeconomics principles) during the 2005 fall semester were collected. The surveys were administered on the first day of class prior to any discussion regarding the class, instructor expectations of students, or the distribution of course syllabi. The survey provided us with information regarding students' grade predictions for the class as well as self-reported data designed to control for student quality and student perceptions of economics relative to other disciplines. Data from the University database provided us with students' actual course grades and other university-reported data which we used to control for student quality and student college experience. Some observations were dropped because the student did not earn a grade in the class or did not answer one or more of the relevant questions. Our final data set consisted of 416 observations.

The dependent variable for our regression model is EXPECTED GRADE – ACTUAL GRADE. Because the dependent variable is the result of choices made by the students which are ordered and discrete, we estimate an ordered probit model. Since the model requires using non-negative numbers for the dependent variable, EXPECTED GRADE – ACTUAL GRADE is expressed as follows: 0 if the student underestimates or if the student's actual grade equals his/her expected grade, 1 if the student overestimates his/her grade by one grade point, 2 if the student overestimates his/her grade by two grade points, 3 if the student overestimates his/her grade by three grade points, and 4 if the student overestimates his/her grade by four grade points. This latter case occurs if the student expects that they will receive an A in the class, but instead earns a course grade of an F. Table 1 shows the descriptive statistics for the variables used in this study. While the mean expected grade was a 3.38, the mean of the actual grade was nearly one grade-point lower, at 2.43.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
ACTUAL GRADE	2.4279	1.2261	0	4
EXPECTED GRADE	3.3774	0.6581	1	4
TGPA>B	0.2115	0.4089	0	1
LIKEGRDE	3.8365	0.3702	3	4
SIGNAL	0.5192	.5002	0	1
WRKEC>6	0.2043	0.4037	0	1
WRK>12	0.3870	0.4877	0	1
HSTUD>6	0.1514	0.3589	0	1
HXMST>3	0.3389	0.4739	0	1
ACT>25	0.2692	.4441	0	1
CUMGPA	2.8026	0.6928	0	4
COLECON	0.2981	0.4580	0	1
ERNDHRS	55.2644	30.6758	0	170
MALE	0.4688	0.4996	0	1
AGE	20.8062	3.7059	16.5	47.78
MINORITY	0.1154	0.3199	0	1
BUSMAJ	0.5361	0.4993	0	1
FEMINSTR	0.5313	0.4996	0	1

Two of our explanatory variables measure student aspirations. The first is a categorical variable, TGPA>B, that equals one if the student reports their target grade point average for the upcoming semester to be 3.5 or greater. As the descriptive statistics show, a little more than 21 percent of the students fit this category. A second aspirational variable is LIKEGRDE which is the class grade

students report they would like to earn. The mean for this grade was 3.84, with no student reporting their desired grade below a 3.0.

The independent variable, SIGNAL, was designed to provide a general sense of a student's willingness to engage in signaling behavior and asked the student to consider the following hypothetical situation:

> Jack is enrolled in a college course in which he believes it will be difficult to earn an acceptable grade. In an attempt to influence his grade he plans on appearing interested during lecture, asking questions over the material, participating in class discussion, and visiting the professor's office to ask for additional clarification of the material. These actions are done **primarily** to get a better grade, not to better learn the material.

The survey question asks if the student ever has engaged or ever would engage in this behavior. If the student responded affirmatively to this question, SIGNAL was equal to one. As the descriptive statistics show, over one-half of the students reported that they either have engaged or would engage in this behavior.

We have included several variables to control for academic effort, academic ability or success, academic experience, student demographics, student major, and instructor gender. WRKEC>6 and WRK>12, are categorical variables measuring the expected study goals of the students. WRKEC>6 equals one if the student expects to spend more than six hours per week studying for this course while WRK>12 equals one if the student expects to study more than 12 hours per week for all courses in order to obtain their target GPA. Slightly more than 20 percent of the students planned to study more than six hours for their economics course while almost 39 percent planned to study more than 12 hours per week for all their courses.

Two categorical variables measuring past academic effort are HSTUD>6 which equals one if the student studied more than six hours per week in high school, and HXMST>3 which equals one if the student studied more than three hours for a major high school exam. Only slightly more than 15 percent of the students reported studying more than 6 hours per week in high school, while nearly 34 percent studied more than three hours for a major high school exam.

A categorical variable, ACT>25, is included to control for academic ability. This variable equals one if the student scored above 25 on the ACT test. Almost 27 percent of the students reported that they fit this category. For the 340 students for

which the University had ACT score records, the average was 22. The estimated average score from the self-reported category was also 22. The variable CUMGPA was the actual cumulative grade-point average that was obtained from the University records. The typical student entered these principles classes having earned a high C average.

Controls for prior academic experience are COLECON, a categorical variable that equals one if the student reported having taken any college economics course in a prior semester, and ERNDHRS which measures how may college credit hours the student had compiled prior to the semester of the survey as reported by the University. Just less than 30 percent of the students reported taking at least one economics course prior to this principles course, and the typical student had previously earned over 55 credit hours.

Almost 47 percent of the students in these principles classes were male, the average age of the students was nearly 21 years, about 11.5 percent were reported as being a minority by the University, and almost 54 percent were enrolled as business majors (BUSMAJ). Just over 53 percent of the students were in a class with a female instructor (FEMINSTR).

The results of the ordered probit estimation are reported in Table 2. The chi-squared test that all parameters except the intercept are equal to zero is rejected at the one percent level. The pseudo R-squared measure, calculated as 1 minus the ratio of the unrestricted log-likelihood to the restricted log-likelihood (McFadden 1974), shows that the model explains nearly 20 percent of the variation in the dependent variable. Further, none of the estimated threshold variables, Mu_j (j = 1, 2, 3), significantly differ from the threshold values (Mu_j = j) at the one percent level of significance.

Table 2: Ordered Probit Results

Variable	Coefficient
Constant	2.0098***
	(0.7506)
TGPA>B	0.3062**
	(0.1506)
LIKEGRDE	0.5320***
	(0.1619)

Table 2: Ordered Probit Results	
Variable	Coefficient
SIGNAL	0.2004*
	(0.1146)
WRKEC>6	0.1050
	(0.1542)
WRK>12	0.0669
	(0.1276)
HSTUD>6	-0.0712
	(0.1750)
HXMST>3	-0.0961
	(0.1302)
ACT>25	-0.5101***
	(0.1455)
CUMGPA	-1.2120***
	(0.0987)
COLECON	-0.3826***
	(0.1477)
ERNDHRS	-0.0045**
	(0.0023)
MALE	0.1150
	(0.1153)
AGE	0.0093
	(0.0186)
MINORITY	0.1717
	(0.1789)
BUSMAJ	-0.1134
	(0.1230)
FEMINSTR	-0.2447*
	(0.1277)

Table 2: Ordered Probit Results	
Variable	Coefficient
MU_1	0.9748***
	(0.0698)
MU_2	2.1105***
	(0.1023)
MU_3	3.0293***
	(0.1580)
Sample Size	416
Log Likelihood	-456.7402
Chi Squared	221.9894***
Pseudo *R*-squared	0.1955
Standard errors in parentheses * Significant at the 10% level of significance in a two-tailed test ** Significant at the 5% level of significance in a two-tailed test *** Significant at the 1% level of significance in a two-tailed test	

The signs on the aspiration and signaling variables tend to support the idea that both over-optimism and signaling theories are useful in explaining students' grade expectations in principles of economics courses at the University. First, consider the variables measuring student aspiration. The aspiration variables TGPA>B and LIKEGRDE have positive signs and are significant at the five percent and one percent levels, respectively, in two-tailed tests. The sign on these variables is supportive of the idea that, given their ability and past academic performance, students with greater grade aspirations are overly optimistic with respect to their grade expectations. The variable SIGNAL is also positive and significant at the 10 percent level in a two-tailed test. This indicates that students willing to mimic the activities of good students, even if those activities do not cause them to learn more, also have a higher probability of overestimating their actual grade.

Neither expected work effort as measured by WRKEC>6 and WRK>12 nor past work effort as measured by HSTUD>6 and HXMST>3 were significant at even the 10 percent level. Thus it appears that neither students' past work effort nor his expected future work effort have any impact on their grade expectations for the principles of economics courses.

The control variables for academic ability, ACT>25, and academic success, CUMGPA, were negative and significant at the one percent level in a two-tailed test. This is consistent with the idea that better students are less likely to overestimate their grades in this class. Prior academic experience, both in an economics class (COLECON) and overall (ERNDHRS), were also negative and significant at the one percent level and five percent level, respectively. Thus, students with more academic experience were also less likely to overestimate their grades in these classes.

None of the demographic variables were significant. However, the variable measuring the gender of the instructor, FEMINSTR, was negative and significant at the 10 percent level in a two-tailed test. For some reason, students are less likely to overestimate their grades if they have a female instructor.

We also investigated the marginal effects of the independent variables at each possible value of the dependent variable: 0, 1, 2, 3, and 4. The marginal effect for a continuous independent variable is the partial derivative of the probability that the dependent variable attains a specific value given a "small" change in the independent variable. The marginal effect for a categorical variable is [Prob (Y| x = 1) – Prob (Y| x = 0)] where Y is the level of the dependent variable and x is the level of the categorical variable (Green 2003).

Table 3 summarizes the coefficients of the variables for the marginal effects of the ordered probit model. Reading from left to right, this table shows the coefficients from accurate prediction of class grade (Y = 0) to over-estimation of the class grade by 4 points (Y = 4). The coefficients provide information as to the probability of accurate or inaccurate grade predictions on the part of the students. Note that when Y = 0, a significant, positive sign on a coefficient indicates there is a higher probability that a student's grade expectations are accurate, and that he will accurately predict his grade. When Y > 0, a significant, positive sign on a coefficient indicates there is a higher probability that a student's grade expectations are inaccurate, and that he will over-predict his grade.

Note that all of the marginal effects are consistent. If the coefficient is significantly different than zero and has a positive sign when Y = 0 it becomes negative when Y > 0 if it is significantly different from zero. Likewise, coefficients that are significant and have a negative sign when Y = 0 become positive when Y > 0 if they are significant. Statistically, we get the intuitive result that variables increasing the probability of accurate prediction of a student's course grade also decrease the probability of over-prediction of course grade on the part of the student.

Table 3: Summary of Marginal Effects					
Variable	Y = 0	Y = 1	Y = 2	Y = 3	Y = 4
TGPA>B	-0.1080***	-0.0002	0.0752	0.0281	0.0050***
	(0.0262)	(0.0063)	(0.2611)	(0.0249)	(0.0016)
LIKEGRDE	-0.1958***	0.0158	0.1308***	0.0425	0.0067*
	(0.0599)	(0.0122)	(0.0315)	(0.1231)	(0.0040)
SIGNAL	-0.0738*	0.0062	0.0491	0.0160	0.0025***
	(0.0251)	(0.0063)	(0.2268)	(0.0326)	(0.0009)
WRKEC>6	-0.0381	0.0020	0.0259	0.0088	0.0014*
	(0.0237)	(0.0035)	(0.2090)	(0.0484)	(0.0008)
WRK>12	-0.0246	0.0018	0.0165	0.0054	0.0009
	(0.0233)	(0.0031)	(0.1991)	(0.0517)	(0.0008)
HSTUD>6	0.0264	-0.0027***	-0.0174	-0.0055	-0.0008
	(0.0218)	(0.0007)	(0.1678)	(0.0678)	(0.0012)
HXMST>3	0.0356*	-0.0034***	-0.0235	-0.0075	-0.0012
	(0.0213)	(0.0000)	(0.0623)	(0.0722)	(0.0013)
ACT>25	0.1936***	-0.0342***	-0.1200	-0.0343	-0.0050*
	(0.0178)	(0.0077)	(0.0796)	(0.1161)	(0.0028)
CUMGPA	0.4461***	-0.0360	-0.2980	-0.0969	-0.0153**
	(0.0384)	(0.0256)	(0.1194)	(0.2554)	(0.0076)
COLECON	0.1440***	-0.0210***	-0.0917	-0.0273	-0.0041*
	(0.0185)	(0.0054)	(0.1022)	(0.1045)	(0.0024)
ERNDHRS	0.0017	-0.0001	-0.0011*	-0.0004	-0.0001
	(0.0008)	(0.0001)	(0.0007)	(0.0010)	(0.0000)
MALE	-0.0422*	0.0033	0.0283	0.0092	0.0015**
	(0.0240)	(0.0043)	(0.2094)	(0.0447)	(0.0007)
AGE	-0.0034	0.0003	0.0023	0.0007	0.0001
	(0.0068)	(0.0006)	(0.0042)	(0.0030)	(0.0003)
MINORITY	-0.0614**	0.0012	0.0424	0.0152	0.0026***
	(0.0244)	(0.0041)	(0.2270)	(0.0419)	(0.0010)

Table 3: Summary of Marginal Effects

Variable	Y = 0	Y = 1	Y = 2	Y = 3	Y = 4
BUSMAJ	0.0416**	-0.0032***	-0.0279	-0.0091	-0.0015
	(0.0209)	(0.0008)	(0.1580)	(0.0767)	(0.0014)
FEMINSTR	0.0896***	-0.0066*	-0.0600	-0.0199	-0.0032
	(0.0189)	(0.0038)	(0.1263)	(0.0959)	(0.0022)

Standard errors in parentheses
* Significant at the 10% level of significance in a two-tailed test
** Significant at the 5% level of significance in a two-tailed test
*** Significant at the 1% level of significance in a two-tailed test

Both aspirational variables, TGPA>B and LIKEGRDE, are negative and statistically significant for the students in the sample who did not over-predict their grade in these economic classes (Y = 0). The LIKEGRDE variable is positive and significant at the one percent level for Y = 2, and both aspirational variables are significant and positive in the most extreme case of over-prediction, Y = 4. These results could be capturing the overly optimistic expectations of students previously discussed.

The signal variable is negative and significant at Y = 0 and positive and significant at Y = 4. This supports the claim that those who are willing to mimic better students are less likely to correctly predict their course grades and are more likely to over-predict their grade. As stated previously, this indicates that students may be engaged in signaling behavior in an attempt to earn a higher course grade than they are able to obtain through their own efforts.

The variables controlling for academic ability and academic experience behave as we would expect in explaining marginal effects of grade prediction. In general, students with greater ability and experience, as indicated by ACT>25, CUMGPA, and COLECON, are more likely to correctly predict their course grade and less likely to over-predict their course grade. ERNDHRS is only significant at the margin when we examine the probability of over-predicting the course grade by 2 letter grades. In this instance, ERNDHRS is negatively correlated to over-prediction.

Finally, we examine the marginal effects of student gender, student minority status, student major, and instructor gender. Both males and minorities are less

likely to make accurate grade predictions for the course at the margin. Likewise, both groups are more likely to over-predict their grade in the most extreme case of Y = 4. Business majors are more likely to predict their grade accurately and, at the margin, are less likely to over-predict their grade by one point. For the other marginal cases, being a business major is not significant. The same is true if students have a female instructor.

The results of the overall effects and the marginal effects seem to provide support for both hypotheses of student behavior as it applies to course grade prediction. This is not surprising as student behavior is extremely complex and likely to be simultaneously motivated by several factors. These results lead to different recommendations with regards to instructor response to student overestimation of grades and are discussed in the final section of our paper.

CONCLUSION

Sabot and Wakeman-Linn (1991) show that economics tends to be a "low-grading" subject. Our data are consistent with this result in that students responding to our survey indicated they perceived economics to be more difficult than other courses. In spite of this perception and regardless of academic ability or past performance (as indicated by variables such as high school study experiences, ACT scores, and college grade point average), these students expected to receive a grade of at least 3.0 in their principles of economics classes. These seemingly unrealistic expectations may result from two sources: over-optimism and signaling. In the first instance, students may not have a clear understanding of their abilities or may face cultural pressures to express aspirations exceeding their abilities. In the second instance, students may be attempting to signal instructors in order to receive higher grades than they are capable of obtaining through their academic effort.

If expectations are the result of the former, there are implications for students' academic performance. Literature shows that individuals who have overly optimistic expectations can end up in a worse position than individuals who have more realistic expectations. Hartman (1983) finds that individuals who do not have their expectations met tend to decrease effort. In terms of students, this implies that when grade expectations are not achieved, effort falls, and ultimately their academic performance deteriorates. In this case, steps to bring about a closer match between performance and expectations should be taken. Educating students about the demands of college-level work, enhancing study skills, and providing non-

threatening feedback could bring about more realistic expectations and thereby improve academic performance.

In the case of signaling, students are simply attempting to have instructors engage in less stringent grading practices. In this case, over-prediction will not have a negative impact on effort and student performance. Instead, it will result in confounding information that can affect instructor ability to accurately assign a grade based on student mastery of course knowledge and skills. In this instance, steps should be taken to provide instructors with student information. Such information could assist instructors in interpreting student signals and thereby enhance the process of differentiating between high-ability and low-ability students. In this case, instructors may be less likely to lower standards on the basis of false information.

Our empirical results indicate that students are driven by both of the aforementioned forces. Policies designed to bring student perceptions more into line with reasonable performance expectations should be coupled with efforts to provide instructors with more information about individual student ability. This will not only help to maximize student performance in the course but will also benefit instructors' efforts to differentiate between high-ability and low-ability students and prevent the lowering of grading standards on the basis of false signals.

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