United States Court of Appeals for the Federal Circuit

SAP AMERICA, INC.,
Plaintiff-Appellee

v.

INVESTPIC, LLC,
Defendant-Appellant

2017-2081

Appeal from the United States District Court for the Northern District of Texas in No. 3:16-cv-02689-K, Judge Ed Kinkeade.

OPINION ISSUED: May 15, 2018
OPINION MODIFIED: August 2, 2018*

KATHERINE VIDAL, Winston & Strawn LLP, Menlo Park, CA, argued for plaintiff-appellee. Also represented by MICHAEL A. BITTNER, THOMAS M. MELSHEIMER, Dallas, TX; TYLER JOHANNES, Chicago, IL; STEFFEN NATHANAEL JOHNSON, Washington, DC; JOHN D. VANDENBERG, Klarquist Sparkman, LLP, Portland, OR.

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* This opinion has been modified and reissued following a petition for rehearing filed by Defendant-Appellant.

CECIL E. KEY, DiMuroGinsberg PC – DGKeyIP Group, Tysons Corner, VA, argued for defendant-appellant. Also represented by TERESA MARIE SUMMERS; JAY P. KESAN, McLean, VA.

Before LOURIE, O'MALLEY, and TARANTO, *Circuit Judges*.

TARANTO, *Circuit Judge*.

InvestPic, LLC's U.S. Patent No. 6,349,291 describes and claims systems and methods for performing certain statistical analyses of investment information. We addressed this patent in *In re Varma*, 816 F.3d 1352 (Fed. Cir. 2016), where we construed key claim terms and partly reversed and partly vacated the Patent Trial and Appeal Board's cancellations of various claims in two reexamination proceedings involving issues of anticipation and obviousness under 35 U.S.C. §§ 102 and 103. The present appeal involves a declaratory judgment action filed in 2016 by SAP America, Inc., which alleges, among other things, that the claims of the '291 patent are invalid because their subject matter is ineligible for patenting under 35 U.S.C. § 101. When SAP moved for a judgment on the pleadings on that ground, the district court granted the motion, holding all claims ineligible under § 101 and hence invalid. *SAP Am., Inc. v. Investpic, LLC*, 260 F. Supp. 3d 705, 718–19 (N.D. Tex. 2017).

We affirm. We may assume that the techniques claimed are "[g]roundbreaking, innovative, or even

brilliant," but that is not enough for eligibility. *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 591 (2013); *accord buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1352 (Fed. Cir. 2014). Nor is it enough for subject-matter eligibility that claimed techniques be novel and nonobvious in light of prior art, passing muster under 35 U.S.C. §§ 102 and 103. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 89–90 (2012); *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) ("[A] claim for a *new* abstract idea is still an abstract idea. The search for a § 101 inventive concept is thus distinct from demonstrating § 102 novelty."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (same for obviousness) (*Symantec*). The claims here are ineligible because their innovation is an innovation in ineligible subject matter. Their subject is nothing but a series of mathematical calculations based on selected information and the presentation of the results of those calculations (in the plot of a probability distribution function). No matter how much of an advance in the finance field the claims recite, the advance lies entirely in the realm of abstract ideas, with no plausibly alleged innovation in the non-abstract application realm. An advance of that nature is ineligible for patenting.

I

A

Describing aspects of existing practices declared to be in need of improvement, the '291 patent states that "conventional financial information sites" on the World Wide Web "perform rudimentary statistical functions" that "are not useful to investors in forecasting the behavior of financial markets because they rely upon assumptions that the underlying probability distribution function ('PDF') for the financial data follows a normal or Gaussian distribution." '291 patent, col. 1, lines 24–36. That assumption, the patent says, "is generally false": "the PDF for financial market data is heavy tailed (i.e., the histograms of financial market data typically involve many outliers containing important information)," rather than symmetric like a normal distribution. *Id.*, col. 1, lines 36–37, 41–44. Moreover, "statistical measures such as the standard deviation provide no meaningful insight into the distribution of financial data." *Id.*, col. 1, lines 44–46. As a result, the patent asserts, conventional "analyses understate the true risk and overstate [the] potential rewards for an investment or trading strategy." *Id.*, col. 1, lines 53–54.

To remedy those deficiencies, the patent proposes a technique that "utilizes resampled statistical methods for the analysis of financial data," which do not assume a normal probability distribution. *Id.*, col. 1, line 65 through col. 2, line 3. One such method is a bootstrap method, which estimates the distribution of data

in a pool (a sample space) by repeated sampling of the data in the pool. *Id*., col. 10, lines 20–38. A sample space in a bootstrap method can be defined by selecting a specific investment or a particular period of time. *Id*., col. 12, lines 62–66. Data samples are drawn from the sample space "with replacement": samples are drawn from the sample space and then returned to the pool before the next sample is drawn. *Id*., col. 10, lines 60–62, col. 11, lines 18–20. The patent also describes using a "bias parameter" to "specif[y] the degree of randomness in the resampling process." *Id*., col. 11, lines 55–58. In order to "perform a resampled statistical analysis," a client "may specify a number of parameters including an investment or investments (e.g., a portfolio) to be analyzed, a financial function, a sample size, a period, a type of plot and a bias parameter, which controls the randomness of the resampling process." *Id*., col. 2, lines 50–56.

As this case came to us from the district court, claims 1, 11, and 22 were the remaining independent claims of the '291 patent.[1] Claims 1 and 11 are method claims. Claim 1 read as follows:

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[1] Several months after InvestPic filed its opening brief in this court, reexamination certificates issued that amended those and other claims, added new claims, and cancelled others. At least because some of the changes merely make dependent claims independent and other claims are unchanged, and because pre-change damages might be available for valid claims that remain sufficiently unaltered as a substantive matter, the validity issues before us (involving subject matter eligibility) are not moot. *See Lexington Luminance LLC v. Amazon.com Inc.*, 601 F. App'x 963, 967 n.1 (Fed. Cir. 2015). In its briefing to the panel, InvestPic

> 1. A method for calculating, analyzing and displaying investment data comprising the steps of:
>
> > (a) selecting a sample space, wherein the sample space includes at least one investment data sample;
> >
> > (b) generating a distribution function using a resampled statistical method and a bias parameter, wherein the bias parameter determines a degree of randomness in a resampling process; and,
> >
> > (c) generating a plot of the distribution function.

Id., col. 16, lines 35–43. Claim 11 stated the following:

> 11. A method for providing statistical analysis of investment data over an information network, comprising the steps of:
>
> > (a) storing investment data pertaining to at least one investment;

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argued neither that the issues were moot nor that the claims emerging from reexamination are valid even if the pre-reexamination claims are not. Indeed, InvestPic urged this court in its reply brief to address the claims as they emerged from reexamination. We do so, concluding that any remand for further consideration of the post-reexamination claims would be futile. The most that the reexamination changes do is to add details to the abstract ideas in the claims; they add nothing to the non-abstract elements of the claims, which remain wholly conventional computer and display devices. The reexamination changes therefore do not alter our invalidity analysis and conclusion, which we present largely using the claims addressed by the district court.

(b) receiving a statistical analysis request corresponding to a selected investment;

(c) receiving a bias parameter, wherein the bias parameter determines a degree of randomness in a resampling process; and,

(d) based upon investment data pertaining to the selected investment, performing a resampled statistical analysis to generate a resampled distribution.

Id., col. 17, lines 17–30.

Claim 22, a system claim, read as follows:

22. A system for providing statistical analysis of investment information over an information network comprising:

a financial data database for storing investment data;

a client database;

a plurality of processors collectively arranged to perform a parallel processing computation, wherein the plurality of processors is adapted to:

receive a statistical analysis request corresponding to a selected investment;

based upon investment data pertaining to the selected investment, perform

> a resampled statistical analysis to generate a resampled distribution; and,
>
> provide a report of the resampled distribution.

Id., col. 18, lines 14–27.[2]

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[2] The changes on reexamination were as follows: The words "in sample selection" were added after "randomness" in each of claim 1 and claim 11. *See* J.A. 1827A. Claim 22 was changed to read:

> A system for providing statistical analysis of investment information over an information network comprising:
>
> a financial data database for storing investment data *corresponding to two or more selected investments, wherein the investment data comprises at least a first investment data value associated with a first investment and a second investment data value associated with a second investment;*
>
> *a sample space that includes at least the first investment data value and the second investment data value, the sample space being determined based at least in part upon one statistical analysis user request to perform at least one statistical analysis that corresponds to the two or more selected investments;*
>
> a client data base; and
>
> a plurality of processors collectively arranged to perform a parallel processing computation, wherein the plurality of processors is adapted to:
>
> receive [a] *the one* statistical analysis *user* request corresponding to

B

In May 2017, the district court granted SAP's motion for judgment on the pleadings. *SAP*, 260 F. Supp. 3d at 718–19. The court concluded that the claims of the '291 patent are directed to "performing statistical analysis," specified using words in the claims and using more technical, mathematical

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> [a] *the two or more* selected [investment] *investments*,
>
> based upon *the one statistical analysis user request*, investment data *samples* pertaining to the *two or more* selected [investment] *investments drawn from the sample space, and at least one return object corresponding to each of the first and second investment data values*, perform a resampled statistical analysis *that preserves a temporal correlation between the two or more selected investments* to generate a resampled distribution; and
>
> provide a report of the resampled distribution.

J.A. 1837 (italics show additions; brackets show deletions).

Claims 6, 17, and 24–26 were rewritten in independent form. Post-reexamination claims 6, 17, and 26 merely incorporate the language of the claims on which they previously depended. *See* J.A. 1827, 1837. Claim 24 modifies the "bias parameter" limitation so that it "determines a degree of randomness in sample selection in a resampling process." *See* J.A. 1837. Claim 25 incorporates limitations substantially identical to the revised claim 22. See *id.* Reexamination claims 32–40 are new; claim 32, quoted *infra*, is representative of those claims for current purposes.

notation in the written description. *Id*. at 711. Because mathematical calculations and formulas are not patent eligible, the court concluded, all of the claims of the '291 patent, including the dependent claims (which contain more specific mathematical steps) are not directed to patent-eligible subject matter. *Id*. at 714–15, 717–18. The court then ruled that the claims add no inventive concept to the mathematics to which they are directed—merely (a) further-specified mathematical calculations and (b) pre- and post-solution activities like use of the internet or generic computer hardware. *Id*. at 715–18.

The district court issued its final judgment on May 18, 2017, and InvestPic filed its notice of appeal on May 22, 2017, within the 30-day time limit. *See* 28 U.S.C. § 2107(a). We therefore have jurisdiction to hear this appeal pursuant to 28 U.S.C. § 1295(a)(1).

II

We review a judgment on the pleadings under Rule 12(c) de novo. *See Hughes v. The Tobacco Inst., Inc.*, 278 F.3d 417, 420 (5th Cir. 2001). "The standard for deciding a Rule 12(c) motion is the same as a Rule 12(b)(6) motion to dismiss. The court accepts all well-pleaded facts as true, viewing them in the light most favorable to the plaintiff," which "must plead enough facts to state a claim to relief that is plausible on its face." *Guidry v. American Public Life Ins. Co.*, 512 F.3d 177, 180 (5th Cir. 2007) (internal citations and quotation marks omitted).

Eligibility under 35 U.S.C. § 101 is a question of law, based on underlying facts. *See Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018); *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1364-65 (Fed. Cir. 2018). Like other legal questions based on underlying facts, this question may be, and frequently has been, resolved on a Rule 12(b)(6) or (c) motion where the undisputed facts, considered under the standards required by that Rule, require a holding of ineligibility under the substantive standards of law. *See*, *e.g.*, *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1341 (Fed. Cir. 2017); *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1328 (Fed. Cir. 2017); *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1098 (Fed. Cir. 2016); *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1380 (Fed. Cir. 2016); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 717 (Fed. Cir. 2014). This is such a case.

Section 101 provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. The provision, however, "contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). A claim falls outside § 101 where (1) it is "directed to" a patent-ineligible concept, *i.e.*, a law of nature, natural phenomenon, or abstract idea, and (2), if so, the particular elements of the claim, considered

"both individually and 'as an ordered combination,'" do not add enough to "'transform the nature of the claim' into a patent-eligible application." *Id.* at 2355; *see Mayo*, 566 U.S. at 78–79. The first stage of the *Alice* inquiry looks at the "focus" of the claims, their "'character as a whole'"; and the second stage of the inquiry (where reached) looks more precisely at what the claim elements add—specifically, whether, in the Supreme Court's terms, they identify an "'inventive concept'" in the application of the ineligible matter to which (by assumption at stage two) the claim is directed. *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1353–1356 (Fed. Cir. 2016) (quoting *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016)); *see also Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1338 (Fed. Cir. 2017) (*Capital One)*; *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015).

A

The claims in this case are directed to abstract ideas. The focus of the claims, as reflected in what is quoted above, is on selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis. That is all abstract.

We have explained that claims focused on "collecting information, analyzing it, and displaying certain

results of the collection and analysis" are directed to an abstract idea. *Electric Power*, 830 F.3d at 1353. "Information as such is an intangible," hence abstract, and "collecting information, including when limited to particular content (which does not change its character as information), [i]s within the realm of abstract ideas." *Id.* (citing cases). So, too, is "analyzing information . . . by mathematical algorithms, without more." *Id.* at 1354 (citing cases, including *Parker v. Flook*, 437 U.S. 584 (1978), and *Gottschalk v. Benson*, 409 U.S. 63 (1972)). And "merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis." *Id.* (citing cases). The claims here are directed at abstract ideas under those principles.

Contrary to InvestPic's contention, the claims here are critically different from those we determined to be patent eligible in *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016). The claims in *McRO* were directed to the creation of something physical—namely, the display of "lip synchronization and facial expressions" of animated characters on screens for viewing by human eyes. *Id.* at 1313. The claimed improvement was to how the physical display operated (to produce better quality images), unlike (what is present here) a claimed improvement in a mathematical technique with no improved display mechanism. The claims in *McRO* thus were not abstract in the sense that is dispositive here. And those

claims also avoided being "abstract" in another sense reflected repeatedly in our cases (based on a contrast not with "physical" but with "concrete"): they had the specificity required to transform a claim from one claiming only a result to one claiming a way of achieving it. *McRO*, 837 F.3d at 1314; *see Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1305–06 (Fed. Cir. 2018); *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016); *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1265 (Fed. Cir. 2016); *see also Two-Way Media*, 874 F.3d at 1337; *Secured Mail Solutions LLC v. Universal Wilde, Inc.*, 873 F.3d 905, 909 (Fed. Cir. 2017); *RecogniCorp*, 855 F.3d at 1326; *Symantec*, 838 F.3d at 1316.

Similarly, in *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1348–49 (Fed. Cir. 2017), the improvement was in a physical tracking system. The use of mathematics to achieve an improvement no more changed the conclusion that improved physical things and actions were the subject of the claimed advance than it did in *Diamond v. Diehr*, 450 U.S. 175 (1981). Here, in contrast, the focus of the claims is not a physical-realm improvement but an improvement in wholly abstract ideas—the selection and mathematical analysis of information, followed by reporting or display of the results.

Contrary to InvestPic's suggestion, it does not matter to this conclusion whether the information here is information about real investments. As many cases make clear, even if a process of collecting and analyzing information is "limited to particular content" or a

particular "source," that limitation does not make the collection and analysis other than abstract. *Electric Power*, 830 F.3d at 1353, 1355 (citing cases). Moreover, the "investment" character of this information simply invokes a separate category of abstract ideas involved in *Alice* and many of our cases—"the creation and manipulation of legal obligations such as contracts involved in fundamental economic practices." *Id.* at 1354; *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015) ("At best, the claims describe the automation of the fundamental economic concept of offer-based price optimization through the use of generic-computer functions."); *see Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1055 (Fed. Cir. 2017); *buySAFE*, 765 F.3d at 1353–54.

InvestPic also argues that the '291 patent's claims are similar to others we have concluded were patentable at the first stage of the *Alice* inquiry, specifically the claims in *Enfish* and *BASCOM*. In those cases, claims were patent-eligible because they were directed to improvements in the way computers and networks carry out their basic functions. *Enfish*, 822 F.3d at 1335–36; *BASCOM*, 827 F.3d at 1348–49; *see Electric Power*, 830 F.3d at 1354. The claims in *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1259–60 (Fed. Cir. 2017), were similar. Here, the focus of the claims is not any improved computer or network, but the improved mathematical analysis; and indeed, the specification makes clear that off-the-shelf computer technology is usable to carry out the analysis. *See*, *e.g.*, '291 patent, col. 4, lines 13–22, col 5, lines 28-37, col. 6, lines 13–16,

col. 14, lines 50–61. The claims of the '291 patent thus fit into the familiar class of claims that do not "focus . . . on [] an improvement in computers as tools, but on certain independently abstract ideas that use computers as tools." *Electric Power*, 830 F.3d at 1354.

B

Because the claims are directed to an abstract idea, we must proceed to the second stage of the *Alice* inquiry. We readily conclude that there is nothing in the claims sufficient to remove them from the class of subject matter ineligible for patenting and transform them into an eligible application. What is needed is an inventive concept in the non-abstract application realm. Here, all of the claim details identified by InvestPic—including in the claims that emerged from reexamination—fall into one or both of two categories: they are themselves abstract; or there are no factual allegations from which one could plausibly infer that they are inventive. In these circumstances, judgment on the pleadings that the claims recite no "inventive concept" is proper.

We have already noted that limitation of the claims to a particular field of information—here, investment information—does not move the claims out of the realm of abstract ideas. Dependent method claims 2–5, 7, and 10 add "limitations . . . [that] require[] the resampling method to be a bootstrap method." *SAP*, 260 F. Supp. 3d at 715. Likewise, "[c]laims 8 and 9 add limitations that the statistical

method is a jackknife method and a cross validation method." *Id*. at 716. Because bootstrap, jackknife, and cross-validation methods are all "particular methods of resampling," those features simply provide further narrowing of what are still mathematical operations. They add nothing outside the abstract realm. *See Mayo*, 566 U.S. at 88–89 (stating that narrow embodiments of ineligible matter, citing mathematical ideas as an example, are still ineligible); *buySAFE*, 765 F.3d at 1353 (same). Dependent method claims 12–21 are no different. The same is true of the enumerations of processes carried out by computers in the claims added on reexamination. *See* J.A. 1837–39.[3]

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[3] For example, the added claim 32 reads:

A system for providing statistical analysis of investment information over an information network comprising:

> a financial data database for storing investment data corresponding to two or more selected investments, wherein the investment data comprises at least a first investment data value associated with a first investment and a second investment data value associated with a second investment;
>
> a sample space that includes at least the first investment data value and the second investment data value, the sample space being determined based at least in part upon one user request to perform at least one statistical analysis that corresponds to the two or more selected investments;
>
> a first data structure for storing a first return object having a first time field and a first value field, wherein the first time field stores a first time corresponding to a time of a return of the first investment, and wherein the first value field stores the investment data value of

Some of the claims require various databases and processors, which are in the physical realm of things. But it is clear, from the claims themselves and the specification, that these limitations require no improved computer resources InvestPic claims to have invented, just already available computers, with their

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> the first investment at the time stored in the first time field;
>
> a second data structure for storing a second return object having a second time field and a second value field, wherein the second time field stores a second time corresponding to a time of a return of the second investment, and wherein the second value field stores the investment data value of the second investment at the time stored in the second time field;
>
> a client data base; and
>
> a plurality of processors collectively arranged to perform a parallel processing computation, wherein the plurality of processors is adapted to:
>
> > receive the statistical analysis request corresponding to the two or more selected investments,
> >
> > based upon the one statistical analysis request and investment data samples pertaining to the two or more selected investments drawn from the sample space, perform a resampled statistical analysis, wherein the first return object of the first investment and the second return object of the second investment both correspond to a time period to preserve a temporal correlation between the two or more selected investments, to generate a resampled joint distribution; and
> >
> > provide a report of the resampled joint distribution.

J.A. 1837–38.

already available basic functions, to use as tools in executing the claimed process. Although counsel for InvestPic contended at oral argument that the inclusion of a "parallel processing" computing architecture in claim 22 (now also in added claims 32–40) should render the claim patent eligible, Oral Arg. at 13:10–13:45, neither the claims nor the specification call for any parallel processing architectures different from those available in existing systems. Rather, to the extent that parallel processing is discussed in the specification, it is characterized as generic parallel processing components—not even asserted to be an invention of InvestPic—on which the claimed method could run. '291 patent, col. 14, lines 50–61.

In accordance with the Supreme Court's conclusion in *Alice*, 134 S. Ct. at 2358–59, this court has ruled many times that "such invocations of computers and networks that are not even arguably inventive are insufficient to pass the test of an inventive concept in the application of an abstract idea," *Electric Power*, 830 F.3d at 1355 (internal quotation marks omitted) (citing cases). *See*, *e.g.*, *Credit Acceptance*, 859 F.3d at 1055–56; *Smart Sys. Innovations, LLC v. Chicago Transit Auth.*, 873 F.3d 1364, 1374–75 (Fed. Cir. 2017); *Secured Mail*, 873 F.3d at 911–12. Under those decisions, an invocation of such computers and networks is not enough to establish the required "inventive concept" in application. Indeed, we think it fair to say that an invocation of already-available computers that are not themselves plausibly asserted to be an advance, for use in carrying out improved mathematical calculations,

amounts to a recitation of what is "well-understood, routine, [and] conventional." *Mayo*, 566 U.S. at 73. Here, that conclusion is properly drawn under the standards governing Rule 12(c) motions.

There is, in short, nothing "inventive" about any claim details, individually or in combination, that are not themselves in the realm of abstract ideas. In the absence of the required "inventive concept" in application, the claims here are legally equivalent to claims simply to the asserted advance in the realm of abstract ideas—an advance in mathematical techniques in finance. Under the principles developed in interpreting § 101, patent law does not protect such claims, without more, no matter how groundbreaking the advance. An innovator who makes such an advance lacks patent protection for the advance itself. If any such protection is to be found, the innovator must look outside patent law in search of it, such as in the law of trade secrets, whose core requirement is that the idea be kept secret from the public.

III

For the foregoing reasons, we affirm the judgment of the district court.

AFFIRMED

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KATHERINE VIDAL, Winston & Strawn LLP, Menlo Park, CA, argued for plaintiff-appellee. Also represented by MICHAEL A. BITTNER, THOMAS M. MELSHEIMER, Dallas, TX; TYLER JOHANNES, Chicago, IL; STEFFEN NATHANAEL JOHNSON, Washington, DC; JOHN D. VANDENBERG, Klarquist Sparkman, LLP, Portland, OR.

CECIL E. KEY, DiMuroGinsberg PC—DGKeyIP Group, Tysons Corner, VA, argued for defendant-appellant.

Also represented by TERESA MARIE SUMMERS; JAY P. KESAN, McLean, VA.

Before LOURIE, O'MALLEY, and TARANTO, *Circuit Judges.*

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InvestPic, LLC's U.S. Patent No. 6,349,291 describes and claims systems and methods for performing certain statistical analyses of investment information. We addressed this patent in *In re Varma*, 816 F.3d 1352 (Fed. Cir. 2016), where we construed key claim terms and partly reversed and partly vacated the Patent Trial and Appeal Board's cancellations of various claims in two reexamination proceedings involving issues of anticipation and obviousness under 35 U.S.C. §§ 102 and 103. The present appeal involves a declaratory judgment action filed in 2016 by SAP America, Inc., which alleges, among other things, that the claims of the '291 patent are invalid because their subject matter is ineligible for patenting under 35 U.S.C. § 101. When SAP moved for a judgment on the pleadings on that ground, the district court granted the motion, holding all claims ineligible under § 101 and hence invalid. *SAP Am., Inc. v. InvestPic, LLC*, 260 F. Supp. 3d 705, 718-19 (N.D. Tex. 2017).

We affirm. We may assume that the techniques claimed are "[g]roundbreaking, innovative, or even brilliant," but that is not enough for eligibility. *Ass'n for*

Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 591 (2013); *accord buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1352 (Fed. Cir. 2014). Nor is it enough for subject-matter eligibility that claimed techniques be novel and nonobvious in light of prior art, passing muster under 35 U.S.C. §§ 102 and 103. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 89-90 (2012); *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) ("[A] claim for a *new* abstract idea is still an abstract idea. The search for a § 101 inventive concept is thus distinct from demonstrating § 102 novelty."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (same for obviousness) (*Symantec*). The claims here are ineligible because their innovation is an innovation in ineligible subject matter. Their subject is nothing but a series of mathematical calculations based on selected information and the presentation of the results of those calculations (in the plot of a probability distribution function). No matter how much of an advance in the finance field the claims recite, the advance lies entirely in the realm of abstract ideas, with no plausibly alleged innovation in the nonabstract application realm. An advance of that nature is ineligible for patenting.

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A

Describing aspects of existing practices declared to be in need of improvement, the '291 patent states

that "conventional financial information sites" on the World Wide Web "perform rudimentary statistical functions" that "are not useful to investors in forecasting the behavior of financial markets because they rely upon assumptions that the underlying probability distribution function ('PDF') for the financial data follows a normal or Gaussian distribution." '291 patent, col. 1, lines 24-36. That assumption, the patent says, "is generally false": "the PDF for financial market data is heavy tailed (i.e., the histograms of financial market data typically involve many outliers containing important information)," rather than symmetric like a normal distribution. *Id.*, col. 1, lines 36-37, 41-44. Moreover, "statistical measures such as the standard deviation provide no meaningful insight into the distribution of financial data." *Id.*, col. 1, lines 44-46. As a result, the patent asserts, conventional "analyses understate the true risk and overstate [the] potential rewards for an investment or trading strategy." *Id.*, col. 1, lines 53-54.

To remedy those deficiencies, the patent proposes a technique that "utilizes resampled statistical methods for the analysis of financial data," which do not assume a normal probability distribution. *Id.*, col. 1, line 65 through col. 2, line 3. One such method is a bootstrap method, which estimates the distribution of data in a pool (a sample space) by repeated sampling of the data in the pool. *Id.*, col. 10, lines 20-38. A sample space in a bootstrap method can be defined by selecting a specific investment or a particular period of time. *Id.*, col. 12, lines 62-66. Data samples are drawn from the

sample space "with replacement": samples are drawn from the sample space and then returned to the pool before the next sample is drawn. *Id.*, col. 10, lines 60-62, col. 11, lines 18-20. The patent also describes using a "bias parameter" to "specif[y] the degree of randomness in the resampling process." *Id.*, col. 11, lines 55-58. In order to "perform a resampled statistical analysis," a client "may specify a number of parameters including an investment or investments (e.g., a portfolio) to be analyzed, a financial function, a sample size, a period, a type of plot and a bias parameter, which controls the randomness of the resampling process." *Id.*, col. 2, lines 50-56.

Claims 1, 11, and 22 are the remaining independent claims of the '291 patent.[1] Claims 1 and 11 are method claims. Claim 1 reads as follows:

> 1. A method for calculating, analyzing and displaying investment data comprising the steps of:
>
> (a) selecting a sample space, wherein the sample space includes at least one investment data sample;
>
> (b) generating a distribution function using a re-sampled statistical method and a bias parameter, wherein the bias parameter determines a

[1] In this court, InvestPic has quoted various amended or added claims it has proposed in an ex parte reexamination. We have not been informed that those claims have issued. Those claims are not before us.

> degree of randomness in a resampling process; and,
>
> (c) generating a plot of the distribution function.

Id., col. 16, lines 35-43. Claim 11 states the following:

> 11. A method for providing statistical analysis of investment data over an information network, comprising the steps of:
>
> (a) storing investment data pertaining to at least one investment;
>
> (b) receiving a statistical analysis request corresponding to a selected investment;
>
> (c) receiving a bias parameter, where-
> in the bias parameter determines a degree of randomness in a resampling process; and,
>
> (d) based upon investment data pertaining to the selected investment, performing a resampled statistical analysis to generate a resampled distribution.

Id., col. 17, lines 17-30.

Claim 22 is a system claim and reads as follows:

> 22. A system for providing statistical analysis of investment information over an information network comprising:

> a financial data database for storing investment data;
>
> a client database;
>
> a plurality of processors collectively arranged to perform a parallel processing computation, wherein the plurality of processors is adapted to:
>
> receive a statistical analysis request corresponding to a selected investment;
>
> based upon investment data pertaining to the selected investment, perform a resampled statistical analysis to generate a resampled distribution; and,
>
> provide a report of the resampled distribution.

Id., col. 18, lines 14-27.

B

In May 2017, the district court granted SAP'S motion for judgment on the pleadings. *SAP*, 260 F. Supp. 3d at 718-19. The court concluded that the claims of the '291 patent are directed to "performing statistical analysis," specified using words in the claims and using more technical, mathematical notation in the written description. *Id.* at 711. Because mathematical calculations and formulas are not patent eligible, the court

concluded, all of the claims of the '291 patent, including the dependent claims (which contain more specific mathematical steps) are not directed to patent-eligible subject matter. *Id.* at 714-15, 717-18. The court then ruled that the claims add no inventive concept to the mathematics to which they are directed—merely (a) further-specified mathematical calculations and (b) pre- and post-solution activities like use of the internet or generic computer hardware. *Id.* at 715-18.

The district court issued its final judgment on May 18, 2017, and InvestPic filed its notice of appeal on May 22, 2017, within the 30-day time limit. *See* 28 U.S.C. § 2107(a). We therefore have jurisdiction to hear this appeal pursuant to 28 U.S.C. § 1295(a)(1).

II

We review a judgment on the pleadings under Rule 12(c) de novo. *See Hughes v. The Tobacco Inst., Inc.*, 278 F.3d 417, 420 (5th Cir. 2001). "The standard for deciding a Rule 12(c) motion is the same as a Rule 12(b)(6) motion to dismiss. The court accepts all well-pleaded facts as true, viewing them in the light most favorable to the plaintiff," which "must plead enough facts to state a claim to relief that is plausible on its face." *Guidry v. American Public Life Ins. Co.*, 512 F.3d 177, 180 (5th Cir. 2007) (internal citations and quotation marks omitted).

Eligibility under 35 U.S.C. § 101 is a question of law, based on underlying facts. *See Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121,

1125 (Fed. Cir. 2018); *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1364-65 (Fed. Cir. 2018). Like other legal questions based on underlying facts, this question may be, and frequently has been, resolved on a Rule 12(b)(6) or (c) motion where the undisputed facts, considered under the standards required by that Rule, require a holding of ineligibility under the substantive standards of law. *See, e.g.*, *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1341 (Fed. Cir. 2017); *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1328 (Fed. Cir. 2017); *Fair-Warning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1098 (Fed. Cir. 2016); *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1380 (Fed. Cir. 2016); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 717 (Fed. Cir. 2014). This is such a case.

Section 101 provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. The provision, however, "contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). A claim falls outside § 101 where (1) it is "directed to" a patent-ineligible concept, *i.e.*, a law of nature, natural phenomenon, or abstract idea, and (2), if so, the particular elements of the claim, considered "both individually and 'as an ordered combination,'" do not add enough to "'transform the nature of the claim' into a patent-eligible application." *Id.* at 2355; *see*

Mayo, 566 U.S. at 78-79. The first stage of the *Alice* inquiry looks at the "focus" of the claims, their "'character as a whole'"; and the second stage of the inquiry (where reached) looks more precisely at what the claim elements add—specifically, whether, in the Supreme Court's terms, they identify an "'inventive concept'" in the application of the ineligible matter to which (by assumption at stage two) the claim is directed. *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1353-1356 (Fed. Cir. 2016) (quoting *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016)); *see also Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1338 (Fed. Cir. 2017) (*Capital One*); *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015).

A

The claims in this case are directed to abstract ideas. The focus of the claims, as is plain from their terms, quoted above, is on selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis. That is all abstract.

We have explained that claims focused on "collecting information, analyzing it, and displaying certain results of the collection and analysis" are directed to an abstract idea. *Electric Power*, 830 F.3d at 1353. "Information as such is an intangible," hence abstract,

and "collecting information, including when limited to particular content (which does not change its character as information), [i]s within the realm of abstract ideas." *Id.* (citing cases). So, too, is "analyzing information . . . by mathematical algorithms, without more." *Id.* at 1354 (citing cases, including *Parker v. Flook*, 437 U.S. 584 (1978), and *Gottschalk v. Benson*, 409 U.S. 63 (1972)). And "merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis." *Id.* (citing cases). The claims here are directed at abstract ideas under those principles.

Contrary to InvestPic's contention, the claims here are critically different from those we determined to be patent eligible in *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016). The claims in *McRO* were directed to the creation of something physical—namely, the display of "lip synchronization and facial expressions" of animated characters on screens for viewing by human eyes. *Id.* at 1313. The claimed improvement was to how the physical display operated (to produce better quality images), unlike (what is present here) a claimed improvement in a mathematical technique with no improved display mechanism. The claims in *McRO* thus were not abstract in the sense that is dispositive here. And those claims also avoided being "abstract" in another sense reflected repeatedly in our cases (based on a contrast not with "physical" but with "concrete"):

they had the specificity required to transform a claim from one claiming only a result to one claiming a way of achieving it. *McRO*, 837 F.3d at 1314; *see Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1305-06 (Fed. Cir. 2018); *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016); *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1265 (Fed. Cir. 2016); *see also Two-Way Media*, 874 F.3d at 1337; *Secured Mail Solutions LLC v. Universal Wilde, Inc.*, 873 F.3d 905, 909 (Fed. Cir. 2017); *RecogniCorp*, 855 F.3d at 1326; *Symantec*, 838 F.3d at 1316.

Similarly, in *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1348-49 (Fed. Cir. 2017), the improvement was in a physical tracking system. The use of mathematics to achieve an improvement no more changed the conclusion that improved physical things and actions were the subject of the claimed advance than it did in *Diamond v. Diehr*, 450 U.S. 175 (1981). Here, in contrast, the focus of the claims is not a physical-realm improvement but an improvement in wholly abstract ideas—the selection and mathematical analysis of information, followed by reporting or display of the results.

Contrary to InvestPic's suggestion, it does not matter to this conclusion whether the information here is information about real investments. As many cases make clear, even if a process of collecting and analyzing information is "limited to particular content" or a particular "source," that limitation does not make the collection and analysis other than abstract. *Electric Power*, 830 F.3d at 1353, 1355 (citing cases). Moreover,

the "investment" character of this information simply invokes a separate category of abstract ideas involved in *Alice* and many of our cases—"the creation and manipulation of legal obligations such as contracts involved in fundamental economic practices." *Id.* at 1354; *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015) ("At best, the claims describe the automation of the fundamental economic concept of offer-based price optimization through the use of generic-computer functions."); *see Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1055 (Fed. Cir. 2017); *buySAFE*, 765 F.3d at 1353-54.

InvestPic also argues that the '291 patent's claims are similar to others we have concluded were patentable at the first stage of the *Alice* inquiry, specifically the claims in *Enfish* and *BASCOM*. In those cases, claims were patent-eligible because they were directed to improvements in the way computers and networks carry out their basic functions. *Enfish*, 822 F.3d at 1335-36; *BASCOM*, 827 F.3d at 1348-49; *see Electric Power*, 830 F.3d at 1354. The claims in *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1259-60 (Fed. Cir. 2017), were similar. Here, the focus of the claims is not any improved computer or network, but the improved mathematical analysis; and indeed, the specification makes clear that off-the-shelf computer technology is usable to carry out the analysis. *See, e.g.*, '291 patent, col. 4, lines 13-22, col 5, lines 28-37, col. 6, lines 13-16, col. 14, lines 50-61. The claims of the '291 patent thus fit into the familiar class of claims that do not "focus . . . on [] an improvement in computers as

tools, but on certain independently abstract ideas that use computers as tools." *Electric Power*, 830 F.3d at 1354.

B

Because the claims are directed to an abstract idea, we must proceed to the second stage of the *Alice* inquiry. We readily conclude that there is nothing in the claims sufficient to remove them from the class of subject matter ineligible for patenting and transform them into an eligible application. What is needed is an inventive concept in the non-abstract application realm. Here, all of the claim details identified by InvestPic fall into one or both of two categories: they are themselves abstract; or there are no factual allegations from which one could plausibly infer that they are inventive. In these circumstances, judgment on the pleadings that the claims recite no "inventive concept" is proper.

We have already noted that limitation of the claims to a particular field of information—here, investment information—does not move the claims out of the realm of abstract ideas. Dependent method claims 2-7 and 10 add "limitations . . . [that] require[ ] the resampling method to be a bootstrap method." *SAP*, 260 F. Supp. 3d at 715. Likewise, "[c]laims 8 and 9 add limitations that the statistical method is a jackknife method and a cross validation method." *Id.* at 716. Because bootstrap, jackknife, and cross-validation methods are all "particular methods of

resampling," those features simply provide further narrowing of what are still mathematical operations. They add nothing outside the abstract realm. *See Mayo*, 566 U.S. at 88-89 (stating that narrow embodiments of ineligible matter, citing mathematical ideas as an example, are still ineligible); *buySAFE*, 765 F.3d at 1353 (same). Dependent method claims 12-21 are no different.

Some of the claims require various databases and processors, which are in the physical realm of things. But it is clear, from the claims themselves and the specification, that these limitations require no improved computer resources InvestPic claims to have invented, just already available computers, with their already available basic functions, to use as tools in executing the claimed process. Although counsel for InvestPic contended at oral argument that the inclusion of a "parallel processing" computing architecture in claim 22 should render the claim patent eligible, Oral Arg. at 13:10-13:45, neither the claims nor the specification calls for any parallel processing system different from those available in existing systems. Rather, to the extent that parallel processing is discussed in the specification, it is characterized as generic parallel processing components—not even asserted to be an invention of InvestPic on which the claimed method could run. '291 patent, col. 14, lines 50-61.

In accordance with the Supreme Court's conclusion in *Alice*, 134 S. Ct. at 2358-59, this court has ruled many times that "such invocations of computers and networks that are not even arguably inventive are

insufficient to pass the test of an inventive concept in the application of an abstract idea," *Electric Power,* 830 F.3d at 1355 (internal quotation marks omitted) (citing cases). *See, e.g.*, *Credit Acceptance*, 859 F.3d at 1055-56; *Smart Sys. Innovations, LLC v. Chicago Transit Auth.*, 873 F.3d 1364, 1374-75 (Fed. Cir. 2017); *Secured Mail*, 873 F.3d at 911-12. Under those decisions, an invocation of such computers and networks is not enough to establish the required "inventive concept" in application. Indeed, we think it fair to say that an invocation of already-available computers that are not themselves plausibly asserted to be an advance, for use in carrying out improved mathematical calculations, amounts to a recitation of what is "well-understood, routine, [and] conventional." *Mayo*, 566 U.S. at 73. Here, that conclusion is properly drawn under the standards governing Rule 12(c) motions.

There is, in short, nothing "inventive" about any claim details, individually or in combination, that are not themselves in the realm of abstract ideas. In the absence of the required "inventive concept" in application, the claims here are legally equivalent to claims simply to the asserted advance in the realm of abstract ideas—an advance in mathematical techniques in finance. Under the principles developed in interpreting § 101, patent law does not protect such claims, without more, no matter how groundbreaking the advance. An innovator who makes such an advance lacks patent protection for the advance itself. If any such protection is to be found, the innovator must look outside patent law in search of it, such as in the law of trade secrets,

whose core requirement is that the idea be kept secret from the public.

III

For the foregoing reasons, we affirm the judgment of the district court.

AFFIRMED

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

SAP AMERICA, INC.,	§	
Plaintiff,	§	
	§	CIVIL ACTION NO.
v.	§	3:16-CV-02689-K
INVESTPIC, LLC,	§	
Defendant.	§	

MEMORANDUM OPINION AND ORDER

Before the Court is SAP America, Inc.'s Motion for Judgment on the Pleadings (Doc. No. 57). After careful consideration of the motion, the response, the reply, the notice of supplemental authority, the supporting appendices, the applicable law, and any relevant portions of the record, the Court **GRANTS** Plaintiff's motion.

1. Background

Plaintiff SAP, America, Inc. ("SAP") filed this suit against Defendant Investpic, LLC ("Investpic"). In its complaint, SAP seeks a declaratory judgment from the Court that its products do not infringe the claims of a patent owned by Investpic and that the claims of that patent are invalid. On October, 18, 2016, Investpic answered and asserted patent infringement counterclaims against SAP. On November 8, 2016, SAP answered the factual allegations of Investpic's counterclaims and then subsequently amended its answer regarding these factual allegations on November 29, 2016. SAP

filed the instant motion on February 23, 2017. SAP then filed a second amended answer to Investpic's counterclaims on February 28, 2017.

In its motion, SAP argues that all of the claims of the patent-in-suit are invalid because the claims address subject matter that is not eligible for patent protection under 35 U.S.C. § 101 and *Alice Corp. Pty v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) and *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012) because the claims are directed toward abstract ideas. Investpic responds that the claims are valid because they are not directed toward abstract ideas and, even if they are, the claims incorporate inventive concepts beyond the abstract ideas that result in the claims addressing patentable subject matter.

2. Applicable Law

a. Judgment on the Pleadings

A motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c) should be granted if the complaint lacks a cognizable legal theory. *Doe v. MySpace, Inc.*, 528 F.3d 413, 418 (5th Cir. 2008). The central issue in a motion for judgment on the pleadings under Rule 12(c) is "whether, in the light most favorable to the plaintiff, the complaint states a valid claim for relief." *Id.* Judgment on the pleadings is appropriate only if there are no disputed issues of facts and only questions of law remain. *Hughes v. Tobacco Inst., Inc.*, 278 F.3d 417, 420 (5th Cir. 2001).

Patent subject-matter eligibility under 35 U.S.C. § 101 is a question of law particularly suitable for resolution at the pleading stage of a patent litigation matter. *See Content Extraction and Transmission LLC v. Wells Fargo Bank, NA*, 776 F.3d 1343, 1349 (Fed. Cir. 2014). The focus of a 35 U.S.C. § 101 inquiry, even at the pleading stage, is on the claims. *Dealertrack Inc. v. Huber*, 674 F.3d 1315, 1334 (Fed. Cir. 2012). Claim construction is not required to conduct a 35 U.S.C. § 101 analysis. *Content Extraction*, 776 F.3d at 1349. Since the focus in a 35 U.S.C. § 101 inquiry is on the claims and claim construction is not necessary for the analysis, subject matter eligibility analysis of the claims may be done at the pleading stage. *Id.*

b. Subject Matter Eligibility Under 35 U.S.C. § 101.

A patent may be obtained for a "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, . . . " 35 U.S.C. § 101. So generally, processes, machines, manufactures, and compositions of matter are eligible subject matter for patent protection. *Alice*, 134 S. Ct. at 2354.

But, this subject matter eligibility is subject to three judicially created exceptions that prevent patents on pure concepts. *Id.*; *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013). The three judicially created exceptions to patent subject matter eligibility are laws of nature,

natural phenomena, and abstract ideas. *Id.* A patent claim may not be obtained for an invention that claims a law of nature, natural phenomena, or an abstract idea, even if the claim satisfies the literal requirements of 35 U.S.C. § 101. *Id.* The judicial exceptions are not patentable because they are "the basic tools of scientific and technological work" and without the exceptions "there would be considerable danger that the grant of patents would tie up the use of such tools and thereby inhibit future innovation." *Id.*

The Supreme Court has set down a two part test to determine if a patent claim is unpatentable due to one of the three judicial exceptions. *Alice*, 134 S. Ct. at 2355. First, a court must determine if the claim is directed to a law of nature, natural phenomenon, or abstract idea. *Id.* If the claim is not directed to one of these three exceptions, then the claim is not subject to a judicial exception and is patentable subject matter, so long as it meets the requirements of 35 U.S.C. § 101. *Id.* If the claim is directed to a judicial exception, then a court must consider the second part of the test. *Id.* In the second part of the test, a court must determine if the claim contains something else, besides the judicially created exception. This must be something else that adds to the claim so that it does not assert a claim over the law of nature, natural phenomena, or abstract idea. *Id.* The requirement for something else ensures that the inventor does not obtain a patent claim over a law of nature, natural phenomena, or abstract idea, which would suppress innovation. *Id.* The "something else" required is an "inventive concept" or an element

or combination of elements that is sufficient to ensure the claim amounts to significantly more than a claim upon the ineligible concept itself. *Id.*

3. Application of Law to Claims of Patent-In-Suit

In the motion, SAP moves the Court to grant judgment on the pleadings and argues that all claims of the patent-in-suit in this matter are invalid because the claims do not address subject matter that is eligible for patent protection under 35 U.S.C. § 101.

a. The Patent-In-Suit

The patent-in-suit is U.S. Patent 6,349,291 (the '291 Patent"), which was issued on February 19, 2002, and is titled "Method and System for Analysis, Display and Dissemination of Financial Information Using Resampled Statistical Methods." Investpic is the current owner of all right, title, and interest in the '291 Patent.

The '291 Patent discloses the invention of a method and system for statistical analysis, display, and dissemination of financial data over a network. '291 Patent at Abstract. The patent discloses, what it asserts, is a novel method to analyze financial markets. *Id.* at 1:60-2:4. Among other functions, the invention can be used for predicting financial market trends. *Id.* The patent asserts that older methods of doing this are not as useful as the method of this invention because

older methods rely on assumptions that do not accurately reflect the way financial markets behave. *Id.* The invention addresses this problem by using a resampled statistical method, which, according to the patent, more accurately reflects financial markets. *Id.* The invention also includes the features of performing the resampled statistical method over a network and with parallel processors. *Id.* at 2:4-37.

Modeling prediction uses a probability distribution function to model the possible outcomes of a particular situation. *Id.* at 1:15-69. According to the patent, the prior art uses a Gaussian distribution as the probability distribution function. *Id.* A Gaussian distribution is a normal probability distribution function, with a peak at the most common occurrence in a data set and symmetrical tails on each side of the peak representing less likely occurrences. *Id.* The further away a point is from the center of a normal distribution, the less likely it is that occurrence will happen. *Id.* So, the tail portions of a normal distribution are much less likely to occur than the center peak. *Id.*

According to the patent, the use of a Gaussian distribution as a probability distribution function fails to account for the reality of financial markets because financial markets are more prone to experience extreme occurrences than is reflected in a normal distribution. *Id.* In a normal distribution, the probability of these extreme occurrences is represented by the tails of the distribution, where it is unlikely that the occurrences will actually happen. *Id.* According to the inventor, this does not reflect the true nature of financial markets.

Id. The inventor claims that relying on the underlying assumptions of Gaussian distribution results in poor prediction of financial markets. *Id.*

The inventor claims that the invention of the patent solved this problem by using a different method to generate a probability distribution function, instead of applying a Gaussian curve to the original data set used for the modeling, the invention uses resampling to generate the sample set for the statistical analysis. *Id.* at 1:60-3:29. In general, resampling involves generating a data subset from the source data. *Id.* at 15:34-16:21. The resampled data set can be generated in a number of manners including random selection of the subset or a biased selection the subset. *Id.* The '291 Patent claims methods and systems that create resampled data sets using a bias parameter. *Id.* at 16:34-18:65. The bias parameter is used to insert bias into the resampled data set, so that the resampled data set can be used in statistical analysis to mimic certain financial market conditions, such as a bias toward a strong or weak market. *Id.* at 15:34-16:21.

b. The Independent Method Claims of the '291 Patent

The '291 Patent has two independent claim methods, Claim 1 and Claim 11. Claim 1 reads as follows:

> A method for calculating, analyzing and displaying investment data comprising the steps of:

(a) selecting a sample space, wherein the sample space includes at least one investment data sample;

(b) generating a distribution function using a re-sampled statistical method and a bias parameter, wherein the bias parameter determines a degree of randomness in a resampling process; and

(c) generating a plot of the distribution function.

'291 Patent 16:34-42.

Claim 11 reads as follows:

A method for providing statistical analysis of investment data over an information network, comprising the steps of:

(a) storing investment data pertaining to at least one investment;

(b) receiving a statistical analysis request corresponding to a selected investment;

(c) receiving a bias parameter, wherein the bias parameter determines a degree of randomness in a resampling process; and,

(d) based upon investment data pertaining to the selected investment, performing a resampled statistical analysis to generate a resample distribution.

'291 Patent at 17:17-29.

So, while the dependent method claims vary in some respects, both include obtaining a sample of investment data, obtaining a bias parameter, and performing a statistical analysis on a resampled set of data that was selected based upon selection by the bias parameter.

SAP argues that these claims amount to nothing more than the execution of an abstract idea with no inventive concept, so the claims are not patentable subject matter. SAP asserts that the claims only perform mathematical functions and pre- and post-solution activities; that mathematical calculations are abstract ideas; and that the pre- and post-solution activities do not make these claims patentable subject matter. According to SAP, the claims are invalid.

Investpic argues that the claims are not directed toward an abstract idea. Instead, according to Investpic, the claims address an invention that solves technical problems in the field of data science. Investpic assets [sic] that because this solves a technical problem the claims are not an abstract idea, so they pass the first part of the *Alice* test. Investpic further asserts that since the claims address an innovative technical solution under 35 U.S.C. §§ 102 and 103, the claims also have the inventive concept required by the second step of the *Alice* test. For these reasons, Investpic argues that the claims address patentable subject matter.

Under the test set out in *Alice*, the Court must first turn to the language of the claims to determine if

the claims are directed toward an abstract idea. Both Claims 1 and 11 involve a data set and a bias parameter. The data set is resampled using the bias parameter and a statistical analysis is performed on the resampled data set. Claim 1 then generates a plot of the distribution function generated by the statistical method. Claim 11 generates a resampled distribution from the statistical analysis.

Both dependent claims are directed toward performing statistical analysis. Statistical analysis of this data is a mathematical calculation, which is made clear through examples of possible statistical analyses given in the patent specification. According to a described embodiment, the system version of the invention stores various functions related to the statistical analysis. '291 Patent at 9:1-59. These functions are the mathematical formulas used in performing resampled statistical analysis of the financial data. *Id.* The specification goes on to provide various examples of possible functions that may be used for the statistical analysis. *Id.* These include functions for determining gross rate of return, maximum drawdown, and a monitor function. *Id.* For each of these, the specification provides an example mathematic formula used to perform the statistical analysis. *Id.* The specification of the '291 Patent makes it clear that the "statistical analysis" of the claims refers to mathematical calculations, like the ones described in the specification. Mathematical calculations and formulas are abstract ideas. *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972). Since mathematical calculations are abstract ideas

and all that these limitations require is performance of mathematical calculations, the Court concludes this portion of these claims is directed toward an abstract idea.

Both Dependent Claims 1 and 11 also have limitations that require bias parameters that are used to resample a given data set before performing the statistical analysis. The bias parameter is used to resample a data set, to create a new data set. '291 Patent at 10:1-11:12. In general terms, a resampled data set is generated by selecting various data points from the original data set. *Id.* The bias parameter is used to input a bias into the resampled set. *Id.*

For example, as described by the specification and Figure 14 of the '291 Patent, the bias parameter can be used to insert bias into the resampled data set so that the data set more accurately reflects market conditions, such as strong or weak markets, by biasing the number of strong days and weak days that are used in the resampled analysis. '291 Patent at 10:1-11:12. and Fig. 14. Figure 14 and the corresponding specification language provide an example of how biasing for strong or weak market conditions would occur. '291 Patent at 16:9-21. According to the specification, a bias parameter is first selected. The bias parameter is a number between 0 and 1, with 1 representing the most favorable market and 0 representing the least favorable market. *Id.* The numbers in between 0 and 1 represent various degrees of market conditions between the two extremes. *Id.* After selection of the bias parameter, the system randomly generates another number. *Id.* This

number is determined to be lesser or greater than the bias parameter. *Id.* If it is lesser, a good day is randomly selected from the original data set. *Id.* If it is greater, a bad day is randomly selected from the original data set. *Id.* This process is repeated a predetermined number of times to generate a new data set, also referred to as the resampled data set, which, according to the inventor, more accurately represents market conditions than the normal distribution of the original data set. *Id.* By varying the bias parameter, the method can be used to, for example, generate resampled data sets that are more or less biased toward good or poor market conditions. According to the '291 Patent, this example is one of the possible ways to generate a resampled data set and is an example of one of the possible types of biases that can be introduced through resampling of the data set. *Id.*

The Court finds that this step of the method claims is also directed toward an abstract idea. This resampling procedure is nothing more than data manipulation to create a new data set from an existing data set. The bias parameter and resampling procedure represents the abstract idea of making a data set biased through the use of a bias parameter and, more generally, the abstract idea of manipulating data.

The Court is not persuaded by the multiple arguments Investpic asserts to support its conclusion that these claims are not directed toward an abstract idea. Investpic contends, for example, that the claims are directed toward solving a particular technical problem in data science; that the claims focus on an invention that

is new and useful; and that the claimed invention is particularly innovative.

Regarding Investpic's assertion that the claim is new, useful, and particularly inventive, Investpic argues that the invention combines two types of thinking in the field of statistical analysis and probability. According to Investpic, these two types of thinking are "frequentist" and "Bayesian" paradigms. Prior to the claimed invention, Investpic argues that the conventional belief was that the "frequentist" and "Bayesian" statistical analyses were incompatible with each other and could not be combined to provide useful results. Investpic goes on to argue that because of the inventor's unique background, the inventor was not hampered by this bias prevalent in the prior art, so the inventor was able to combine frequentist and Bayesian thinking to create the invention claimed.

Assuming without deciding that this contention is even true, the Court is not persuaded by this argument and would still find this is directed toward an abstract idea. The novelty of an invention is not a factor used to determine if a claim is directed to a judicial exception. *Parker v. Flook*, 437 U.S. 584, 591 (1978). For example, the Pythagorean Theorem could not have been patented at the time it was discovered, no matter how novel it was, because it is a mathematical concept, which is an abstract idea. *Id.* at 590. While it may be true that the claimed invention was novel, unexpected, and unconventional, this is not relevant to the determination of whether or not the claim is directed toward an abstract idea. *Id.*

Investpic also argues that the claims are not abstract concepts because they address a specific means or method that improves the relevant technology rather than a result or effect that itself is the abstract idea which merely invokes generic processes and machinery. Investpic compares the claims of the '291 Patent to those in *DDR Holdings, LLC v. Hotels.com LP*, 773 F.3d 1245 (Fed. Cir. 2014), *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016), and *McRO, Inc. v. Bandai Namco Games Am, Inc.*, 837 F.3d 1299 (Fed. Cir. 2016). *DDR* involved a patent related to the website advertising methods. *DDR*, 773 F.3d at 1248. *McRO* involved a patent related to algorithms used by a computer to animate characters [sic] faces in computer programs. *McRO*, 837 F.3d at 1303. *Enfish* involved a patent related to the structure of computerized databases. *Enfish*, 822 F.3d at 1338. The patents in each of these cases involved the use of computer hardware to perform the claimed inventions. *DDR*, 773 F.3d at 1248; *McRO*, 837 F.3d at 1303; *Enfish*, 822 F.3d at 1338. These patents were all challenged as being unpatentable because they encompassed abstract ideas performed by generic computer hardware. *DDR*, 773 F.3d at 1255-59; *McRO*, 837 F.3d at 1311-16; *Enfish*, 822 F.3d at 1335-40. In each of these cases, the Federal Circuit rejected this argument and concluded that the claims of these patents were directed toward inventions that addressed specific methods to improve the functioning of the computers themselves, and that was patentable subject matter. *DDR*, 773 F.3d at 1255-59; *McRO*, 837 F.3d at 1311-16; *Enfish*, 822 F.3d at 1335-40. These cases stand for the proposition that claims

focusing on a specific means or method that improves the relevant technology may be patentable if they contain sufficient limitations so that they are not directed toward an abstract idea. *McRO* at 1314. And conversely, claims that are directed to a result or effect that itself is the abstract idea do not pass the first part of the *Alice* test because they are directed toward abstract ideas. *Id.*

Investpic argues that the claims of the '291 Patent, like the claims in *DDR, Enfish*, and *McRO*, are claims for a specific method that improves data science technology and, because of this, the claims address patentable subject matter. The Court disagrees with Investpic's argument that the claims of the '291 Patent are these types of claims. Investpic's analysis fails to account for an important distinction between the claims of the cited cases and the claims of the '291 Patent. In the *DDR, Enfish*, and *McRO* cases relied on by Investpic, the Federal Circuit found additional claim elements and limitations that either sufficiently removed the claims from being directed toward an abstract idea because they improved the functionality of the relevant technology. *DDR*, 773 F.3d at 1255-59; *McRO*, 837 F.3d at 1311-16; *Enfish*, 822 F.3d at 1335-40.

In *McRO*, the claims were directed toward algorithms used to animate faces in software. *McRO*, 837 F.3d at 1303. The invention in *McRO* automated animation of images of computer generated faces to provide improved lip synchronization and facial expressions of the animated characters. *Id.* at 1307. This was done by

application of a set of rules, which would be applied to a particular situation and processed by a computer, to determine the appropriate changes to be made to the animated face. *Id.* While the specification of the patent provided some exemplary rules, the claims in issue did not require any particular rule to be applied. *Id.* at 1307-08. The Federal Circuit disagreed with the district court's finding that the claims were directed toward the abstract idea of automation of facial animations using rules, and concluded they were not directed toward an abstract idea. *Id.* at 1313. The Federal Circuit concluded that the district court failed to recognize that the claims must not be oversimplified in a search for an abstract idea and that a court must look to the claims as an ordered combination without ignoring the requirements of individual steps. *Id.* The Federal Circuit went on to point out that the claims at issue contained multiple other limitations and that not all rules were claimed, but only those within a particular genus. *Id.* The Federal Circuit concluded that in combination, all of these considerations resulted in the claims being directed toward a specific invention that did not monopolize the abstract idea. *Id.* The Federal Circuit reached similar conclusions in *DDR* and *Enfish*. *DDR*, 773 F.3d at 1255-59; *Enfish*, 822 F.3d at 1335-40.

That is not the case presented by the claims of the '291 Patent. The claims of the '291 Patent do not contain any substantial limitations besides those that recite the abstract idea at issue, which is mathematical calculations. Because of this lack of any substantive limitations, the claims of the '291 Patent fall into the

other side of the equation. They are claims directed toward the result or effect of the abstract idea itself. The claims of the '291 Patent are much more like the claims at issue in *Parker v. Flook*, 437 U.S. 584 (1978), than they are like the claims at issue in *DDR*, *Enfish*, and *McRO*.

In *Flook*, the patent claims in issue involved the use of a mathematical calculation to determine an updated alarm limit for a chemical process. *Flook*, 437 U.S. at 585-86. The alarm limit in the process claimed was used to determine if abnormal conditions were present during the process so that an operator could intervene before something went wrong with the process. *Id.* The use of alarm limits was known in the prior art of *Flook*. *Id.* But, the invention claimed in *Flook* used a mathematical equation to calculate an updated alarm limit based on current operating conditions of the chemical process. *Id.* The step involving calculation of the updated alarm limit was the only feature of the claims that was novel. *Id.* Considering this, the Supreme Court determined that the claim did not present patentable subject matter and that allowing the claims would have resulted in a patent on the effect or result of using the mathematical formula. *Id.* at 594-95. The Supreme Court compared this to a patent that claimed use of the formula $2\pi r$ to calculate the circumference of a circle. *Id.* at 595. Such a claim would be unpatentable because alone, it encompassed the effect or result of the mathematical calculation. *Id.* at 595.

The claims of the '291 Patent are difficult to distinguish from the claims in *Flook* and from the Supreme

Court's example of a claim that calculated the circumference of a circle. The claims of the '291 Patent are likewise directed toward an abstract idea because the claims attempt to encompass the result or effect of a mathematical formula, which in this case is the use of statistical analysis formulas to calculate financial data models. The independent method claims of the '291 Patent are not directed toward a specific means or method that improves the relevant technology, but they are directed toward the result or effect of the abstract idea. This is true whether the claim elements are viewed individually or as an ordered combination. Either way, the claims are ultimately directed toward the result of the mathematical calculations.

Since the claims are directed toward the abstract ideas of mathematical calculations and data manipulation, the claims fail the first part of the *Alice* test. Because of this, the Court must further look to the claims to determine if there is something else, such as an inventive concept, that prevents these claims from claiming the abstract idea itself.

Dependent Claims 1 and 11 include other limitations, besides the abstract statistical analysis, bias parameter, and resampled data set requirements. These other limitations include selecting a sample space, generating a plot of results, storing data, receiving requests, and receiving a bias parameter. These other limitations all represent insignificant pre and post solution activity. They do not add any substance to the claims except for reciting the necessary steps to obtain and store data and to report results of the data

manipulation. These types of insignificant pre and post solution activities are insufficient to add an inventive concept to what is otherwise a claim to an abstract idea.

Claim 11's preamble also states that the method is to be performed over an information network. Assuming, that this preamble language is limiting, this network requirement, also, does not add an inventive concept to save this claim. If this preamble language is limiting, then this would require the additional limitation that the method be performed over a network. But, using standard computer hardware to execute an abstract idea is not an inventive concept. *Alice*, 134 S. Ct. at 2357. An abstract idea cannot simply be made patentable by reciting the abstract idea and then requiring that a generic computer execute the abstract idea. *Id.* Claims that recite computer requirements may add an inventive concept if the claim is directed toward a particular improvement in the functioning of the computer. *Enfish*, 822 F.3d at 1336. But, this is not the case for claims where a computer limitation is merely a tool for executing the abstract idea. *Id.* In Claim 11 of the patent-in-suit, even if the network requirement is a limitation of the claim, this would not save the claim by adding an inventive concept. This would merely be using a network as a tool to carry out the abstract idea.

Because independent Claims 1 and 11 are directed toward the abstract idea of mathematical calculations and data manipulation with no additional inventive concept, the Court finds that Claims 1 and 11 are not

directed toward patentable subject matter and are invalid.

c. The Dependent Method Claims of the '291 Patent

The '291 Patent also contains a number of dependent method claims that depend upon independent Claims 1 and 11. Claims 2, 3, 4, 5, 6, 7, 8, 9, and 10 are ultimately dependent on Claim 1. Claims 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21 are ultimately dependent on Claim 11.

Because the Court has already determined Claims 1 and 11 are directed toward abstract ideas, these dependent claims are all also directed toward the same abstract ideas. They fail the first part of the *Alice* test. But, the Court must still analyze them under the second portion of the *Alice* test to determine if additional limitations of the dependent claims could add an inventive concept so that they address patentable subject matter. *Alice*, 134 S. Ct. at 2355.

Claims 2, 3, 4, 5, 6, 7, and 10 all add limitations to Claim 1 related to the resampled statistical method, which requires the resampling method to be a bootstrap method. '291 Patent at 16:43-17:16. Claim 2 adds this limitation and the other listed dependent claims add further detailed limitations as to the bootstrap method. *Id.* Claims 8 and 9 add limitations that the statistical method is a jackknife method and a cross validation method, respectively. *Id.* Bootstrap, jackknife,

and cross validation are all particular methods of resampling. *Id.*

These additional limitations of Claims 2, 8, and 9, which are the ones specifying the bootstrap, jack knife, and cross validation methods, respectively, do not add any inventive concept to the abstract ideas of Claim 1. In the analysis of the independent method claims, the Court has already determined that the statistical analysis limitation of the independent claims is directed toward the abstract idea of mathematical calculations. The dependent claims only specifically identify what particular resampling method is applied to the data. The fact remains that these methods are still abstract ideas involving mathematical calculations and data manipulation. There is little difference to the analysis between a generically specified resampling analysis and a specific resampling analysis. Either way, the claim is directed toward mathematical calculations and data manipulation. The Court finds this does not add any inventive concept to the claims which would result in the claims being directed toward patentable subject matter.

Dependent Claims 3, 4, 5, 6, 7, and 10 all add additional limitations to Dependent Claim 2, the one that specifies that the statistical method to be used is a bootstrap method. *Id.* The additional limitations to the bootstrap method also do not add any inventive concept to the claims. Instead, each adds limitations that specify what parameters are used in the bootstrap calculations or add additional mathematical manipulation to the bootstrap data. *Id.* In each of these claims,

the additional limitations still do not take these claims beyond the abstract idea of performing mathematical calculations. The limitations just provide more particulars of the parameters used in those mathematical calculations, which also does not add any inventive concept to these claims.

The claims that are ultimately dependent on Claim 11 also do not contain any inventive concept beyond the abstract idea of Claim 11. Dependent Claim 14 adds the limitation that a bootstrap sample is generated as part of the statistical analysis. *Id.* at 17:37-45. Dependent Claims 15, 16, 17, 18, 19, and 21 all add additional limitations to Dependent Claim 14. *Id.* at 17:46-18:13. The limitations of these claims, like the analogous dependent claims of Claim 1, specify the particular parameters to be used in the mathematical calculations and statistical analysis. *Id.* Like Claim 1's dependent claims, these dependent claims simply specify what particular math is to be performed under the methods. The Court finds that these limitations do not add an inventive concept to the abstract idea of Claim 11 that would result in these claims being directed toward patentable subject matter.

Claims 12, 13, and 20 are also dependent on Claim 11. *Id.* at 17:30-36; 18:9-10. Claim 12 adds a step that involves generating a plot based on the resampled distribution. *Id.* Claim 13 adds details to Claim 12 regarding the statistical analysis request, including that the request include an investment identifier, a periods parameter, a function parameter, a replications parameter, and a plot parameter. *Id.* Claim 20 adds a

limitation that requires the information network to be the internet. *Id.*

The Court finds that none of these additional limitations add an inventive concept that results in the claims being directed toward patent eligible subject matter. The additional limitations of Claims 12 and 13 represent insignificant pre and post solution activity, which is not an inventive concept. The internet limitation of Claim 20 merely requires use of the internet in a generic manner, which also does not add an inventive concept to the claim. The Court finds Dependent Claims 12, 13, and 20 are also invalid because they do not claim patent eligible subject matter.

d. The Independent System Claims of the '291 Patent

The '291 Patent also contains system claims for the disclosed invention. The independent system claims are Claims 22 and 29. Claim 22 reads as follows:

> A system for providing statistical analysis of investment information over an information network comprising:
>
> a financial data base for storing investment data;
>
> a client database;
>
> a plurality of processors collectively arranged to perform a parallel processing computation, wherein the plurality of processors is adapted to:

receive a statistical analysis request corresponding to a selected investment;

based upon investment data pertaining to the selected investment, perform a resampled statistical analysis to generate a resampled distribution; and

provide a report of the resampled distribution.

'291 Patent at 18:14-27.

Claim 29 reads as follows:

A system for providing statistical analysis of investment information over an information network comprising:

a financial data database for storing investment data;

a front end subsystem for receiving a statistical analysis request;

a parallel processor, wherein the parallel processor includes:

at least one processor for performing resampled statistical analysis.

'291 Patent at 18:51-59.

The system claims are simply claims for systems that would be used to perform the steps of the method claims. The system claims include components that: (1) store the information needed for performing the statistical analysis; (2) receive inputs needed for the statistical analysis; (3) perform the statistical analysis; and (4) provide the results of the statistical analysis.

Just like the method claims, the Court finds the system claims are also directed to patent ineligible subject matter.

When a method claim is invalid because it claims an abstract idea, an analogous system claim, which simply performs the abstract idea without additional inventive concept, is also not eligible for patent protection. *Alice*, 134 S. Ct. at 2360; *Bancorp Servs. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1277 (Fed. Cir. 2012). This is the situation presented by the claims of the '291 Patent. Because the method claims are directed toward abstract ideas and the system claims are analogous to the method claims, the system claims are also directed toward an abstract idea and do not pass the first part of the *Alice* test.

Like the dependent method claims, the dependent system claims also fail the second part of the *Alice* test because they fail to add any inventive concept that takes these claims beyond the abstract ideas. The system claims recite a number of limitations, but all of these limitations are either pre or post solution activity or are generic computer components, neither of which adds an inventive concept to the claims. Like the method claims, the system claims have limitations related to the storing, inputting, retrieving, and displaying of information. These are pre and post solution activities. The system claims also require processors for performing the statistical analysis. But, these are merely generic computer components that do not add anything inventive to the claims or relate to some improvement in the way a computer operates. Instead the

generic computer components are used as tools to implement the abstract idea. This also fails to add some inventive concept to the claims. These claims do not contain any other limitations. Since the dependent claims consist only of limitations that recite the abstract ideas, limitations that are pre and post solution activity, and limitations that are generic computer components, the Court finds these claims are directed toward abstract ideas and are invalid because they do not have any inventive concept.

e. The Dependent System Claims of the '291 Patent

The '291 Patent also has a number of dependent system claims that depend on the independent system claims, Claims 22 and 29. The Court has already determined the independent claims do not pass the first part of the *Alice* test because they are directed toward an abstract idea. The Court must now determine if the additional limitations of these dependent claims adds an inventive concept to the claims. *Alice*, 134 S. Ct. at 2355.

The dependent system claims are Claims 23, 24, 25, 26, 27, 28, 30, and 31. '291 Patent at 18:27-65. Many of the limitations that these claims add are analogous to the limitations of the dependent method claims, which did not add an inventive concept to those claims. Claim 23 adds a limitation where the report of Claim 22 is a distribution plot. *Id.* at 18:28-29. Claim 24 adds additional details to the content of the statistical

analysis request of Claim 22. *Id.* at 18:30-33. Claim 25 adds limitations specifying that the processors can perform a bootstrap calculation. *Id.* at 18:34-44. Claims 26, 27, and 28 add an alert rule database used to alert a person if a certain condition is determined; hardware capable of alerting a client; and alerts provided by email. *Id.* at 18:41-49. Claim 30 specifies that the front-end system is a web server. *Id.* at 18:60-61. Claim 31 provides additional parallel processing to perform the statistical analysis. *Id.* at 18:62-65.

As with the Court's previous findings, these additional limitations of the dependent system claims do not add any inventive concepts because the claim limitations are pre and post solution activity, add generic computing hardware, or simply specify what type of mathematical calculations are to be performed. The additional limitations of Claims 23, 24, 26, 27, and 28 all directed toward pre and post solution activities regarding which parameters are used for the statistical analysis and what happens based on the results of the statistical analysis. These are not inventive concepts. Claims 30 and 31, which relate to a web server and parallel processors, are recitations of generic computing hardware used as a tool to implement the statistical analysis. These also do not add any inventive concept. And, Claim 25, which specifies that the processor performs a boot strap analysis, also does not add an inventive concept because this limitation just specifies the particular math that is to be performed by generic computer hardware. Because the dependent system claims are directed toward abstract ideas and

they fail to add any inventive concept, the Court finds these claims do not pass either step of the *Alice* test and are invalid because they are directed toward ineligible patent subject matter.

4. Conclusion

In conclusion, the Court finds that all of the claims of the '291 Patent are **invalid** because they are directed toward the abstract ideas of mathematical calculations and data manipulation, and they do not contain any inventive concept that results in the claims addressing patentable subject matter. For these reasons, the Court **grants** SAP's Motion for Judgment on the Pleadings.

SO ORDERED.

Signed May 18th, 2017.

/s/ Ed Kinkeade
ED KINKEADE
UNITED STATES
DISTRICT JUDGE

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

SAP AMERICA, INC.,	§	
Plaintiff,	§	
	§	Civil Action No.
v.	§	3:16-CV-2689-K
INVESTPIC, LLC,	§	
Defendant.	§	

FINAL JUDGMENT

This Judgment is entered pursuant to the Court's Memorandum Opinion and Order of this same date, in which the Court granted Plaintiff's Motion for Judgment on the Pleadings.

It is therefore, ORDERED, ADJUDGED and DECREED that Defendant takes nothing by its suit against Plaintiff, and that Defendant's counterclaims are DISMISSED with prejudice, with all costs taxed against Defendant.

SO ORDERED.

Signed May 18th, 2017.

/s/ Ed Kinkeade
ED KINKEADE
UNITED STATES
DISTRICT JUDGE

NOTE: This order is nonprecedential.

United States Court of Appeals for the Federal Circuit

SAP AMERICA, INC.,
Plaintiff-Appellee

v.

INVESTPIC, LLC,
Defendant-Appellant

2017-2081

Appeal from the United States District Court for the Northern District of Texas, Dallas Division No. 3:16-CV-02689-K, Judge Ed Kinkeade.

ON PETITION FOR PANEL REHEARING AND REHEARING EN BANC

Before PROST, *Chief Judge*, NEWMAN, LOURIE, DYK, MOORE, O'MALLEY, REYNA, WALLACH, TARANTO, CHEN, HUGHES, and STOLL, *Circuit Judges.*

PER CURIAM.

ORDER

Defendant-Appellant InvestPic, LLC, filed a combined petition for panel rehearing and rehearing en banc on June 14, 2018. The petition was referred to the panel that heard the appeal and was thereafter referred to the circuit judges who are in regular active service.

Upon consideration thereof,

IT IS ORDERED THAT:

1) The petition for panel rehearing is granted in part and denied in part. See accompanying order.

2) The petition for rehearing en banc is denied.

3) The mandate of this court will issue on September 11, 2018.

FOR THE COURT

August 2, 2018
Date

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

NOTE: This order is nonprecedential.

United States Court of Appeals for the Federal Circuit

SAP AMERICA, INC.,
Plaintiff-Appellee

v.

INVESTPIC, LLC,
Defendant-Appellant

2017-2081

Appeal from the United States District Court for the Northern District of Texas, Dallas Division No. 3:16-CV-02689-K, Judge Ed Kinkeade.

ON PETITION FOR PANEL REHEARING

Before LOURIE, O'MALLEY, and TARANTO, *Circuit Judges*.

PER CURIAM.

ORDER

Defendant-Appellant InvestPic, LLC, filed a petition for rehearing on June 14, 2018.

Upon consideration thereof,

IT IS ORDERED THAT:

1) InvestPic's petition is granted in part and denied in part by the panel.

2) The previous precedential opinion in this appeal, issued May 15, 2018, is withdrawn and replaced with the modified precedential opinion accompanying this order.

FOR THE COURT

August 2, 2018
Date

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

NOTE: This order is nonprecedential.

United States Court of Appeals

for the Federal Circuit

SAP AMERICA, INC.,
Plaintiff-Appellee

v.

INVESTPIC LLC,
Defendant-Appellant

2017-2081

Appeal from the United States District Court for the Northern District of Texas in No. 3:16-cv-02689-K, Judge Ed Kinkeade.

ON PETITION FOR REHEARING EN BANC

Before PROST, *Chief Judge*, NEWMAN, LOURIE, DYK, MOORE, O'MALLEY, REYNA, WALLACH, TARANTO, CHEN, HUGHES, and STOLL, *Circuit Judges*.

PER CURIAM.

ORDER

Appellant InvestPic LLC filed a petition for rehearing en banc. The petition was first referred as a petition for rehearing to the panel that heard the appeal, and thereafter the petition for rehearing en banc

was referred to the circuit judges who are in regular active service.

Upon consideration thereof,

IT IS ORDERED THAT:

The petition for panel rehearing is denied.

The petition for rehearing en banc is denied.

The mandate of the court will issue on October 17, 2018.

FOR THE COURT

October 10, 2018
Date

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

Constitution of the United States of America, Article I, Section 8, Clause 8

The Congress shall have Power . . .

To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries[.]

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35 U.S. Code § 100

Definitions

When used in this title unless the context otherwise indicates –

(a) The term "invention" means invention or discovery.

(b) The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

(c) The terms "United States" and "this country" mean the United States of America, its territories and possessions.

(d) The word "patentee" includes not only the patentee to whom the patent was issued but also the successors in title to the patentee.

(e) The term "third-party requester" means a person requesting ex parte reexamination under section 302 who is not the patent owner.

(f) The term "inventor" means the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention.

(g) The terms "joint inventor" and "coinventor" mean any 1 of the individuals who invented or discovered the subject matter of a joint invention.

(h) The term "joint research agreement" means a written contract, grant, or cooperative agreement entered into by 2 or more persons or entities for the performance of experimental, developmental, or research work in the field of the claimed invention.

(i) (1) The term "effective filing date" for a claimed invention in a patent or application for patent means –

> (A) if subparagraph (B) does not apply, the actual filing date of the patent or the application for the patent containing a claim to the invention; or
>
> (B) the filing date of the earliest application for which the patent or application is entitled, as to such invention, to a right of priority under section 119, 365(a), 365(b), 386(a), or 386(b) or to the benefit of an earlier filing date under section 120, 121, 365(c), or 386(c).

(2) The effective filing date for a claimed invention in an application for reissue or reissued patent shall be determined by deeming the claim to the invention to have been contained in the patent for which reissue was sought.

(j) The term "claimed invention" means the subject matter defined by a claim in a patent or an application for a patent.

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35 U.S. Code § 101

Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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35 U.S. Code § 102

Conditions for patentability; novelty

(a) Novelty; prior art. A person shall be entitled to a patent unless –

(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention; or

(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

(b) Exceptions.

(1) Disclosures made 1 year or less before the effective filing date of the claimed invention. A disclosure made 1 year or less before the effective filing date of a claimed invention shall not be prior art to the claimed invention under subsection (a)(1) if –

(A) the disclosure was made by the inventor or joint inventor or by another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor; or

(B) the subject matter disclosed had, before such disclosure, been publicly disclosed by the inventor or a joint inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor.

(2) Disclosures appearing in applications and patents. A disclosure shall not be prior art to a claimed invention under subsection (a)(2) if –

(A) the subject matter disclosed was obtained directly or indirectly from the inventor or a joint inventor;

(B) the subject matter disclosed had, before such subject matter was effectively filed under subsection (a)(2), been publicly disclosed by the inventor or a joint inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor; or

(C) the subject matter disclosed and the claimed invention, not later than the effective filing date of the claimed invention, were owned by the same person or subject to an obligation of assignment to the same person.

(c) Common ownership under joint research agreements. Subject matter disclosed and a claimed invention shall be deemed to have been owned by the same person or subject to an obligation of assignment to the same person in applying the provisions of subsection (b)(2)(C) if –

(1) the subject matter disclosed was developed and the claimed invention was made by, or on behalf of, 1 or more parties to a joint research agreement that was in effect on or before the effective filing date of the claimed invention;

(2) the claimed invention was made as a result of activities undertaken within the scope of the joint research agreement; and

(3) the application for patent for the claimed invention discloses or is amended to disclose the names of the parties to the joint research agreement.

(d) Patents and published applications effective as prior art. For purposes of determining whether a patent or application for patent is prior art to a claimed invention under subsection (a)(2), such patent or application shall be considered to have been effectively filed, with respect to any subject matter described in the patent or application –

(1) if paragraph (2) does not apply, as of the actual filing date of the patent or the application for patent; or

(2) if the patent or application for patent is entitled to claim a right of priority under section 119, 365(a), 365(b), 386(a), or 386(b), or to claim the benefit of an earlier filing date under section 120, 121, 365(c), or 386(c), based upon 1 or more prior filed applications for patent, as of the filing date of the earliest such application that describes the subject matter.

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35 U.S. Code § 103

Conditions for patentability; non-obvious subject matter

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

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35 U.S. Code § 112

Specification

(a) In general. The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

(b) Conclusion. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

(c) Form. A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

(d) Reference in dependent forms. Subject to subsection (e), a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

(e) Reference in multiple dependent forms. A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim

shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.

(f) Element in claim for a combination. An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

United States Court of Appeals
for the Federal Circuit

IN RE SAMIR VARMA,
Appellant

2015-1502

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. 90/012,366.

INVESTPIC LLC,
Appellant

v.

INTERNATIONAL BUSINESS MACHINES CORPORATION, SAS INSTITUTE INC.,
Appellees.

2015-1667

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. 95/001,939.

Decided: March 10, 2016

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Before WALLACH, CLEVENGER, and TARANTO, *Circuit Judges*.

TARANTO, *Circuit Judge*.

These two appeals involve U.S. Patent No. 6,349,291, which names Samir Varma as the inventor and is owned by InvestPic LLC (collectively, Varma). The patent describes and claims methods and systems for performing statistical analyses of investment data. The Patent Trial and Appeal Board of the Patent and Trademark Office cancelled certain claims of the '291 patent in two related reexamination proceedings—one

initiated by International Business Machines Corp. and SAS Institute Inc., the other by SAS alone. *IBM v. InvestPic, LLC*, No. 2015-1450, 2015 WL 1456097, at *6 (PTAB Mar. 27, 2015); *Ex parte Varma*, No. 2014-7760, 2014 WL 7186800, at *7 (PTAB Dec. 16, 2014). Varma's appeals center on two claim phrases: (1) a "bias parameter" that "determines a degree of randomness in sample selection in a resampling process"; and (2) "a statistical analysis request corresponding to two or more selected investments." We agree with Varma that the Board erred regarding both claim phrases. Correcting the first error, we reverse the cancellation of claims 1–5, 8–16, 19–21, and 24. Correcting the second error, we vacate the cancellation of claims 22, 23, 25, and 29–31 and remand for further proceedings on those claims.

BACKGROUND

A

The '291 patent states that many "conventional financial information sites" on the World Wide Web furnish information derived from "rudimentary statistical functions [that] are not useful to investors in forecasting the behavior of financial markets because they rely upon assumptions that the underlying probability distribution function ('PDF') for the financial data follows a normal or Gaussian distribution, which is generally false." '291 patent, col. 1, lines 24–37. It adds that "the PDF for financial market data is heavy tailed (i.e., the histograms of financial market data typically involve

many outliers containing important information)" and that "statistical measures such as the standard deviation provide no meaningful insight into the distribution of financial data." *Id.*, col. 1, lines 41–47. Conventional "analyses understate the true risk and overstate potential rewards for an investment or trading strategy." *Id.*, col. 1, line [sic] 53–54.

After those descriptions of deficiencies of conventional methods, the '291 patent's Summary of the Invention states that "[t]he present invention utilizes resampled statistical methods for the analysis of financial data," which does not necessarily follow a normal probability distribution. *Id.*, col. 1, line 65, through col. 2, line 3. One particular resampling method described in the '291 patent is the bootstrap method, which estimates the distribution of data in a pool (sample space) by repeated sampling from the pool. *Id.*, col. 10, lines 20–38. In a bootstrap analysis, one way to define a sample space, *id.*, col. 11, lines 16–17, is by identifying a specific investment or particular time period, *id.*, col. 12, lines 62–66. The "bootstrap" samples of data are then drawn "with replacement": samples are repeatedly drawn from that sample space, and after each drawing, the drawn data returns to the pool for the drawing of the next sample. *Id.*, col. 10, lines 60–62; *id.*, col. 11, lines 18–20. Although samples may be drawn at random, *id.*, col. 10, lines 60–62, the '291 patent also describes using a "'bias' parameter" that "specifies the degree of randomness in the resampling process," *id.*, col. 11, lines 55–58. *See id.*, col. 15, lines 52–62; *id.*, col. 16, lines 9–21. The '291 patent states that, "[i]n order

to perform a resampled statistical analysis, a query is received from a client," who "may specify a number of parameters including an investment *or investments* (e.g., a portfolio) to be analyzed, a financial function, a sample size, a period, a type of plot and a bias parameter, which controls the randomness of the resampling process." *Id.*, col. 2, lines 50–56 (emphasis added).

Claim 1, amended during reexamination, is representative, for present purposes, of the claims that include the "bias parameter" limitation:

> 1. A method for calculating, analyzing and displaying investment data comprising the steps of:
>
> (a) selecting a sample space, wherein the sample space includes at least one investment data sample;
>
> (b) generating a distribution function using a re-sampled statistical method and a bias parameter, wherein the bias parameter determines a degree of randomness <u>in sample selection</u> in a resampling process; and,
>
> (c) generating a plot of the distribution function.

InvestPic J.A. 735 (amendment underlined).

Claim 22, also amended during reexamination, involves a request concerning two or more investments:

22. A system for providing statistical analysis of investment information over an information network comprising:

a financial data database for storing investment data;

a client database;

a plurality of processors collectively arranged to perform a parallel processing computation, wherein the plurality of processors is adapted to:

receive a statistical analysis request corresponding to [a] two or more selected investments;

based upon investment data pertaining to the two or more selected investments, perform a resampled statistical analysis to generate a resampled distribution; and,

provide a report of the resampled distribution.

Varma J.A. 331 (amended version: additions underlined; bracketed word deleted).

Claim 29, also amended during reexamination, is another claim involving two or more investments:

29. A system for providing statistical analysis of investment information over an information network comprising:

> a financial data database for storing investment data pertaining to two or more investments;
>
> a front end subsystem for receiving a statistical analysis request corresponding to two or more selected investments;
>
> a parallel processor, wherein the parallel processor includes:
>
> at least one processor for performing resampled statistical analysis based upon the statistical analysis request.

InvestPic J.A. 742 (amendments underlined).

B

In March 2012, IBM and SAS filed a request for inter partes reexamination of claims 1–31 of the '291 patent—claims lacking the language underlined in the quotations just above.[1] IBM and SAS argued in the reexamination request that the claims are anticipated by each of two prior-art references, Sortino and Barraquand, and in any event rendered invalid for obviousness by those references, with or without additional references.

Sortino, the reference of primary importance in these proceedings, discloses using a bootstrap method to gain better information about the expected returns

[1] IBM and SAS were joined by Algorithmics Inc. in requesting the inter partes reexamination, but Algorithmics is not an appellee in this court.

on an asset, including the uncertainty associated with the expected returns, than is given by the mean and standard deviation of historical data. Sortino speaks of nine asset categories, one being the Standard & Poor's 500 index (S & P 500), and describes performing bootstrap analyses on historical data. As an example, Sortino describes sorting the data for the S & P 500 into seven economic scenarios (*e.g.*, deep recession, mild inflation, chaos) and performing a separate bootstrap analysis on the data from each of the scenarios. After the separate bootstrap analyses, Sortino indicates, the user may inject a subjective judgment into a final set of figures by weighting the results from the seven scenarios to arrive at a combined distribution for the asset. For example, if the investor believes there to be "a 2% chance of a deep recession, a 10% chance of a moderate recession, an 8% chance of a stagnant period, a 60% chance of growth and a 20% chance of moderate inflation," *InvestPic* J.A. 216; *Varma* J.A. 288, the results of the separate bootstrap analyses for those five data sets may be weighted according to the investor's beliefs to give the combined distribution. As for Barraquand, that reference discloses an error-reduction technique (which it calls "quadratic resampling"), applied to pricing a class of financial assets and implemented on a parallel processor.

The examiner granted the request for inter partes reexamination as to claims 1–5, 8–16, 19–21, and 29–31 in May 2012. The examiner then rejected all of those claims: claims 1–5, 10–16, 19, and 21 for anticipation by Sortino; claims 8, 9, 20, and 29–31 for obviousness

over Sortino in view of other references. The examiner found that "Sortino's teaching of identification and use of different scenarios for analyses" meets the "bias parameter" limitation (in the unamended claims). *InvestPic* J.A. 723. The examiner cited the assertion by IBM and SAS that InvestPic effectively "want[ed] to 'rewrite' the claim language as 'wherein the bias parameter determines a degree of randomness **in the selection of samples** in a resampling process' reading in limitations regarding how and when the 'bias parameter' must operate." *InvestPic* J.A. 721 (emphasis in original). In response, InvestPic amended the claims. Claims 1 and 11 were amended to clarify that "the bias parameter determines a degree of randomness *in sample selection* in a resampling process." *InvestPic* J.A. 735, 738 (emphasis added). InvestPic also amended claim 29, on which claims 30 and 31 depend, to include the language underlined in the block quote above, including the requirement that the system "receiv[e] a statistical analysis request corresponding to two or more selected investments." *InvestPic* J.A. 724.

After entering the claim amendments, the examiner again rejected claims 1–5, 10–16, 19, and 21 for anticipation by Sortino and claims 8, 9, 20, and 29–31 for obviousness over Sortino and other prior art. The examiner separately rejected claim 29 for anticipation by Barraquand and claims 30–31 for obviousness over Barraquand and other prior art.

InvestPic appealed to the Board, arguing that Sortino does not teach a bias parameter that is applied in sample selection in a resampling process, as

required by claims 1–5, 8–16, and 19–21; Sortino does not disclose two or more investments, as required by claims 29–31; and Barraquand does not teach a resampling method at all. The Board affirmed the examiner's rejection of the claims for anticipation and obviousness over Sortino. It did not reach the alternative, Barraquand-based grounds of rejection of claims 29–31.

For the requirement of using a bias parameter in sample selection, the Board found "that Sortino teaches the application of bias after an initial selection by application of the various enumerated scenarios." *InvestPic*, 2015 WL 1456097, at *3. For the requirements involving two or more investments, the Board gave several reasons for finding that Sortino suggests the ability to analyze two or more investments. The Board relied on Sortino's ability to conduct distinct analyses of different investments seriatim, which it thought sufficed because of "[t]he absence of a temporal limitation from Owner's claims indicating that 'two or more investments' are analyzed at the same time." *Id.* The Board also cited the transitional term "comprising" in claim 29, which indicates that the claim is open-ended, and the claim's use of the indefinite article "a" when introducing "a statistical analysis request," which has been construed to mean "one or more." Therefore, the Board found that although two requests would be necessary in the Sortino system to analyze two or more investments, using "multiple 'requests' to analyze 'two or more investments[]' shows or suggests the claimed feature." *Id.* at *4.

C

In June 2012, after the examiner had granted the request for inter partes reexamination of claims 1–5, 8–16, 19–21, and 29–31, SAS requested an ex parte reexamination of claims 22–31 of the '291 patent. Claims 22–28 claim systems for performing a statistical analysis of financial data over a network. Claim 22, on which claims 23–28 originally depended, is quoted above. Claim 24, before amendment, required that the claim 22 statistical analysis request include a bias parameter. The amended version of claim 24, now independent, does not involve a requirement of "two or more" selected investments, but it does require (as relevant here) that the bias parameter "determine[ ] a degree of randomness in sample selection in a resampling process."

The examiner granted the request for reexamination of claims 22–28, then confirmed the validity of claims 26–28 but rejected claims 22–25 (when lacking the underlined language) for obviousness over the combination of Sortino, Barraquand, and the prior-art patent Maggioncalda (U.S. Patent No. 6,012,044). Maggioncalda describes a user interface for a financial advisory system that operates over a computer network. The examiner determined that "[i]t would have been obvious . . . to use an interactive computer based financial advisory system, as taught by Maggioncalda, to perform statistical analysis of investment options, as taught by Sortino." *Varma* J.A. 305–06. Further, the examiner determined that it would have been obvious to use the parallel-processing computer system "taught

by Barranquand [sic] in order to be able to perform the calculations more quickly." *Varma* J.A. 306.

Varma then amended claims 22, 24, and 25 by rewriting claims 24 and 25 in independent form, adding the above-underlined language regarding "two or more selected investments" to claims 22 and 25, and specifying that the bias parameter of claim 24 (applicable even to a single investment) "determines a degree of randomness in sample selection in a resampling process." *Varma* J.A. 331–33. The examiner entered the amendments and again rejected claims 22–25 for obviousness over Sortino, Maggioncalda, and Barraquand.

Varma appealed to the Board, arguing that because the bias parameter of claim 24 "cannot be construed as merely biasing in general, or biasing the randomness of something else outside of sample selection in the resampling process itself," *Varma* J.A. 1005, Sortino does not disclose the requisite bias parameter. Varma also argued that Sortino does not teach a resampled analysis of two or more investments as required by claims 22, 23, and 25. The Board agreed with the examiner on both points.

For claim 24 and its bias-parameter limitation, the Board found "that claim 24 does not mandate that the bias parameter be utilized during initial sample selection" and Sortino suggests a bias parameter by "teach[ing] the application of bias after an initial selection by application of the various enumerated scenarios." *Varma*, 2014 WL 7186800, at *4. For the other claims and their two-or-more-investments limitations,

the Board found that Sortino suggests the ability to analyze two or more investments. As in the inter partes reexamination, the Board noted that the claims use the transitional term "comprising" and the indefinite article "a" in the claim term "a statistical analysis request," and on that basis it found "that a system such as that disclosed by Sortino, that may utilize multiple 'requests' to analyze 'two or more investments,' shows or suggests the claimed feature." *Id.* at *3. The Board also observed that the examiner "note[d] that Sortino discloses analysis of the S & P 500 index, which comprises 500 underlying stocks (or investments)." *Id.* at *2.

Varma appeals under 35 U.S.C. § 141(b), challenging the Board's rejection of claims 1–5, 8–16, 19–25, and 29–31. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

Where there is no dispute about findings or evidence of facts extrinsic to the patent, we review de novo the Board's determination of the broadest reasonable interpretation of the claim language. *Straight Path IP Grp., Inc. v. Sipnet EU S.R.O.*, 806 F.3d 1356, 1360 (Fed.Cir.2015). We review the Board's anticipation determination for substantial evidence. *In re Rambus, Inc.*, 753 F.3d 1253, 1256 (Fed.Cir.2014). We review the Board's ultimate obviousness determination de novo and underlying factual findings for substantial

evidence. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed.Cir.2015).

A

Varma's first challenge is to the Board's understanding of the bias parameter required by claims 1–5, 8–16, 19–21, and 24. For the inter partes reexamination, as it comes to us, dependent claims 2–5, 8–10, 12–16, and 19–21 rise or fall with independent claims 1 and 11. For the ex parte reexamination, claim 24 is the sole claim before us presenting this issue.

As a threshold matter, we reject the suggestion that Varma's claim-construction position on the key point involving the bias-parameter limitations is new on appeal and therefore should be disregarded. Varma consistently asserted to the examiner and the Board the meaning of the bias parameter limitation asserted here—that the bias parameter must be applied to the selection of samples from a sample space, as distinguished from the creation of a sample space or the post-sampling combination of results calculated separately from the separate sampling analyses of distinct sample spaces. *See*, *e.g.*, *InvestPic* J.A. 759–60, 1245–47, 1372–75; *Varma* J.A. 355–60, 1035–36.

On the merits, we agree with Varma that there is only one reasonable meaning of the claim language, considered alone and in light of the specification: the bias parameter is used in selecting samples from the sample space, not in creating a sample space, and not in making arithmetic combinations of statistical

measures previously calculated from separate, resampled analyses. The claim language makes this clear. It explicitly states that the bias parameter "determines a degree of randomness in sample selection in a resampling process." *InvestPic* J.A. 735–42; *Varma* J.A. 331–32. Claim 1 clearly differentiates between "selecting a sample space," which occurs in step (a), and "sample selection," which occurs in step (b). The bias parameter is applied in sample selection in step (b), not in step (a)'s creation of a sample space. And "sample selection" is complete before any process of taking calculated statistical results of several distinct sampling processes and combining those measures in a preferred way.

The specification reinforces the distinctions that are clear in the claim language. The specification first describes the bootstrap process generally: "In step 920, *a* sample space x is selected. In step 925, *a* statistical function based on the sample space data is computed. . . . In step 930, bootstrap samples . . . are generated from the sample space using a resampling process." '291 patent, col. 11, lines 16–20 (emphases in original). The sample space, therefore, is created before the resampling process, and bootstrap samples are generated *from the sample space.* The specification then describes a bootstrap process using the bias parameter. The sample space is created in step 1115. *See id.*, col. 12, lines 60–66 ("In particular, in step 1115, *a* sample space is determined using the sample—size parameter received in step 1105. Because financial database 150 *d* may store samples for investments for

many different time periods, in step 1115, *a* set of relevant samples for the resampled statistical analysis requested by the client 105 is determined.") (emphases in original). The bias parameter is applied in step 1135, *after* the creation of the sample space. *Id.*, col. 14, lines 5–10 ("In step 1135, the bias parameter received in step 1105 is analyzed. If no bias is selected (i.e., bias= -1 and data is to be selected randomly), control passes to step 1045 ('no' branch of step 1035). If bias<> 0, in step 1040, a bias initialization algorithm is performed as described in detail below.").

The particular descriptions of use of a bias parameter confirm the point: the samples that produce a single resampling analysis are all drawn from a given sample space, with the bias parameter determining selection of each particular sample. "The 'bias' parameter is a decimal value that is either -1 or between 0 and 1. . . ." *Id.*, col. 11, lines 55–56. "A value of -1 indicates that the resampling process should be conducted purely randomly." *Id.*, col. 11, lines 58–59. When "the 'bias' parameter is between 0 and 1, sampling is performed so that b% of the samples are 'up' days and 1-b% of the samples are 'down' days, where b=bias. Thus, if b=1, only 'up' days will be selected and if b=0 only 'down' days are selected." *Id.*, col. 11, lines 59–64. In the described algorithm for the process, "the sample space is separated into two sets, a first set including only 'up' days and a second set including only 'down' days." *Id.*, col. 16, lines 10–15. Each sample is drawn from either one set or the other based on whether a randomly generated number between 0 and 1 is or is

not less than the bias parameter (between 0 and 1); the distribution of samples, therefore, depends on where between 0 and 1 the bias parameter is set. *Id.*, col. 16, lines 15–22. In this process, the bias parameter controls how samples are selected from the sample space to produce a resampling result for that sample space; it does not change the definition of the sample space itself.

The process leading to the amendments of claims 1, 11, and 24 further supports this reading of the bias parameter. In the inter partes reexamination, when the examiner initially rejected the claims, he stated that Varma's arguments about the bias parameter were effectively "'rewrit[ing]' the claim language as 'wherein the bias parameter determines a degree of randomness **in the selection of samples** in a resampling process' reading in limitations regarding how and when the 'bias parameter' must operate." *InvestPic* J.A. 721 (emphasis in original). Varma then proposed amendments to add "in sample selection," amendments "essentially and helpfully suggested by the Examiner." *InvestPic* J.A. 749. Based on the amended claim language, Varma specifically argued the distinction between "bias in the selection of sample space to do resampling from" and "selection of samples from that sample space, for example, once that space had been selected." *InvestPic* J.A. 749–50 (emphases omitted). In the ex parte reexamination, Varma amended claim 24 in the same manner and for the same reasons.

Given the proper understanding of the bias-parameter limitation, the Board's rejection of claims 1–5, 8–16, 19–21, and 24 must be reversed. The Board's rulings in both reexamination proceedings rely solely on Sortino for this limitation, "find[ing] that Sortino teaches the application of bias after an initial selection by application of the various enumerated scenarios." *InvestPic*, 2015 WL 1456097, at *3; *Varma*, 2014 WL 7186800, at *4. But Sortino does not teach or suggest biasing how samples are selected from a defined sample space to arrive at a resampling-based measure for that sample space.

Sortino allows for the introduction of bias in two ways: (1) by sorting the data into seven economic scenarios to perform separate bootstrap analyses of each scenario; and (2) weighting the individual results of the separate bootstrap analyses for the seven scenarios to produce a combined distribution. Neither option biases the selection of samples in the resampling process as required by the claims. First, Sortino is clear that once a scenario is created, all selection of samples from that scenario is random, not biased. *InvestPic* J.A. 214 n. 4 ("All of the monthly returns for a given asset in a given scenario were entered into a file. Twelve monthly returns were randomly selected from this file and combined to make a single annual return. This procedure was repeated 200 times with replacement to generate the underlying distribution for a given asset in a given scenario."); *Varma* J.A. 286 n. 4. Second, the post-bootstrap weighting of scenarios similarly does not change the selection of samples from a sample

space, and therefore is not the result of the application of a bias parameter within the meaning of the '291 patent. And none of the expert declarations, all of which were submitted before the clarifying claim amendments, supports finding that Sortino biases the selection of samples from the sample space when performing a resampling process.

Finally, we note that the Board did not find, and we have not been shown, that Sortino's process—which sorts data into seven economic scenarios, performs a random bootstrap analysis on each individual scenario, and then allows for arithmetic combination of measures separately derived for each of the scenarios—is mathematically equal to applying a bias in choosing samples from a sample space to create bootstrap samples. We therefore need not decide whether such a showing, if made, would matter to the analysis. *Cf. Zenith Labs., Inc. v. Bristol-Myers Squibb Co.*, 19 F.3d 1418, 1423 (Fed.Cir.1994) (all claim elements must be proved to be met, even if the required evidence is scientifically redundant). Therefore, we conclude that Sortino does not disclose a bias parameter that operates on the selection of samples from a sample space in a resampling process.

B

Varma also challenges the Board's understanding of "a statistical analysis request corresponding to two or more selected investments," as required by claim 22 (and claims 23 and 25) and claim 29 (and

claims 30–31). *InvestPic* J.A. 742–43; *Varma* J.A. 331–33. As with the bias-parameter limitation, we reject the suggestion that Varma's claim-construction position on the key point involving this claim limitation is new in this appeal. On this point, the interpretation of the claims that Varma asserts here is consistent with the meaning it asserted to the examiner and the Board in the reexamination proceedings—that the statistical analysis requested is one that covers two or more investments. *See*, *e.g.*, *InvestPic* J.A. 761–64, 1262–63, 1390–92; *Varma* J.A. 336–40, 1006–13.

In finding this claim limitation met by Sortino, the Board rejected Varma's position. The Board implicitly relied on two related but different interpretations. In Interpretation 1, the claim phrase embraces a request that calls for a statistical analysis of a single investment. Thus, the Board reasoned that Sortino is covered by the claim even if "two requests would be necessary in the Sortino system to accomplish an analysis of 'two or more investments.'" *InvestPic*, 2015 WL 1456097, at *3; *Varma*, 2014 WL 7186800, at *2. In Interpretation 2, the claim phrase embraces a request that calls for statistical analyses of at least two investments, but each analysis may be an analysis of a single investment, and the single-investment analyses may take place seriatim. Thus, the Board agreed with the examiner that there is no "temporal limitation from [the] claims indicating that 'two or more investments' are analyzed at the same time." *InvestPic*, 2015 WL 1456097, at *3; *Varma*, 2014 WL 7186800, at *2. We conclude that both interpretations are unreasonable.

The error of Interpretation 1 is plain from the claim phrase at issue. The phrase requires "a statistical analysis request corresponding to two or more selected investments." *InvestPic* J.A. 742–43; *Varma* J.A. 331–33. That language on its face excludes Interpretation 1. A single request must correspond to at least two investments.

The Board relied on the claims' use of "comprising" as the transitional term, but that term does not support Interpretation 1. Although the transitional term "comprising" indicates that the claim is open-ended, the term does not render each limitation or phrase within the claim open-ended. *See Dippin' Dots, Inc. v. Mosey*, 476 F.3d 1337, 1343 (Fed.Cir.2007); *Spectrum Int'l, Inc. v. Sterilite Corp.*, 164 F.3d 1372, 1380 (Fed.Cir.1998). "Comprising" means that the claim can be met by a system that contains features over and above those specifically required by the claim element, but only if the system still satisfies the specific claim-element requirements: the claim does not cover systems whose unclaimed features make the claim elements no longer satisfied. Thus, here, a claim-covered system may receive more than one request, but it must in particular be adapted to receive "a request" that itself corresponds to two or more selected investments.

The Board also cited the indefinite article "a" before "statistical analysis request" to support Interpretation 1. But while "a" sometimes is non-restrictive as to number, permitting the presence of more than one of the objects following that indefinite article, context matters even as to whether the word has that

meaning. *See Harari v. Lee*, 656 F.3d 1331, 1341 (Fed.Cir.2011). And here the question is not whether there can be more than one request in a claim-covered system: there can. Rather, the question is whether "a" can serve to negate what is required by the language following "a": a "request" (a singular term) that "correspond[s]" to "two or more selected investments." It cannot. For a dog owner to have "a dog that rolls over and fetches sticks," it does not suffice that he have two dogs, each able to perform just one of the tasks. In the present case, no matter how many requests there may be, no matter the variety of the requests the system may receive, the system must be adapted to receive a request that itself corresponds to at least two investments.[2]

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[2] The language here is non-technical, and nothing in the words after "request," based on ordinary usage or context or other intrinsic evidence, implies or even tends to suggest a plurality of requests. In this respect, the phrase is different from "a contact hole for source wiring and gate wiring connection terminals" in *Eidos Display, LLC v. AU Optronics Corp.*, 779 F.3d 1360, 1365–68 (Fed.Cir.2015), where both the technical context and intrinsic evidence made clear that there could not be a single hole for all the connection terminals. The phrase at issue here also differs from an example used in *Eidos:* "I am going to create an electric car for the United States and United Kingdom." *Id.* at 1365. That phrase itself suggests that the "car" referred to is a design that would naturally embrace the necessary country-specific variations in implementation. In the present case, there is no contextual or intrinsic-evidence basis for inferring from the words that come after "request" that the singular term embraces a plurality in some sense.

While the language of the "a statistical analysis request" phrase itself makes clear the unreasonableness of Interpretation 1, it is other claim language—specifically, language in claim 22 (found also in claim 25)—that makes Interpretation 2 unreasonable as an understanding of the "a statistical analysis request" phrase. Claim 22 requires that the plurality of processors be adapted not only to "receive a statistical analysis request corresponding to two or more selected investments," but also to do these additional things: "based upon investment data pertaining to the two or more selected investments, perform *a* resampled statistical analysis to generate *a* resampled distribution; and provide a report of *the* resampled distribution." *Varma* J.A. 331 (emphases added). The reference to "the two or more selected investments" is to the immediately preceding "a statistical analysis request" language. A single resampled statistical analysis must be performed based on data pertaining to those two or more investments. A single resampled distribution must be generated by that analysis, and the single distribution must be reported. The interlocking of singulars in that language makes it unmistakable that at least two investments must be the subject of each statistical analysis that is the subject of the request in the claim phrase at issue. For those reasons, the language of claims 22 and 25 precludes Interpretation 2 for those claims.

Similar language is not found in claim 29, the lone claim in the inter partes reexamination that raises the "two or more selected investments" issue.

But the principle that the same phrase in different claims of the same patent should have the same meaning is a strong one, overcome only if "it is clear" that the same phrase has different meanings in different claims. *Fin Control Sys. Pty, Ltd. v. OAM, Inc.*, 265 F.3d 1311, 1318 (Fed.Cir.2001); *see Digital-Vending Servs. Int'l, LLC v. Univ. of Phoenix, Inc.*, 672 F.3d 1270, 1275 (Fed.Cir.2012); *American Piledriving Equip., Inc. v. Geoquip, Inc.*, 637 F.3d 1324, 1333 (Fed.Cir.2011); *PODS, Inc. v. Porta Stor, Inc.*, 484 F.3d 1359, 1366 (Fed.Cir.2007). IBM and SAS have not pointed to, and we do not see, anything in the language of claim 29, or the specification or prosecution history, that provides the required basis for giving the phrase in claim 29 a meaning different from the meaning of the same phrase in claims 22 and 25. And we do not see why the same-meaning principle is inapplicable here just because the amended versions of the claims were introduced in two different reexamination proceedings (about three weeks apart): claim 29 in the inter partes reexamination on March 15, 2013; claims 22 and 25 in the ex parte reexamination on April 5, 2013. If allowed, the claims would be claims within a single patent.

The amendment history of the claims reinforces the conclusion that Interpretation 2 is unreasonable: Varma specifically argued against that interpretation in both proceedings based on the language at issue. After the unamended claims 29–31 were rejected in the inter partes reexamination, Varma amended claim 29 to add "corresponding to two or more selected investments." *InvestPic* J.A. 742. In doing so, Varma invoked

that language to distinguish Sortino, arguing that "all of [Sortino's] analyses were based upon a single asset at a time." *InvestPic* J.A. 766. Similarly, Varma amended claims 22 and 25 in the ex parte reexamination in response to the examiner's rejections based on the examiner's implicit adoption of Interpretation 2: the examiner found that a request step in Sortino was "implicit, or at least obvious, because various analyses on S & P 500 were actually performed." *Varma* J.A. 305. Varma added the two-or-more-investments limitation and argued that "Sortino disclosed a statistical analysis request corresponding only to a *single* investment or asset category." *Varma* J.A. 337 (emphasis in original).

We conclude that the Board relied on unreasonable interpretations of claim language in claims 22, 23, 25, and 29–31. The proper remedy, we also hold, is to vacate the Board's rejections of those claims for reconsideration of anticipation and obviousness under the correct claim construction.

In the appeal from the ex parte reexamination, the Director of the PTO argues that we may affirm even under the correct claim construction based on the observation by the Board and examiner that Sortino performs an analysis of the S & P 500 index and the S & P 500 index corresponds to 500 underlying securities. IBM and SAS do not make this argument (as to claim 29) in the inter partes reexamination appeal. We reject the Director's position. There is no basis for treating the single index investment (bought by investors as a single investment) as two or more investments in the

assets whose values define the value of the index investment.

Sortino treats the S & P 500 index as a single asset, and it nowhere provides an analysis of the securities underlying the S & P 500 index. IBM and SAS themselves note that Sortino "describes the S & P 500 index as merely one exemplary investment." Brief for Appellees IBM Corp. and SAS Institute Inc. at 52, *InvestPic LLC v. IBM* (No.2015-1667). In his expert declaration, Dr. Sortino stated that the analysis shown in his paper "bootstrapped the whole S & P portfolio, not the lowest level underlying individual securities (e.g., specific stocks, bonds, futures, etc.) within the portfolio," further noting that "this distinction may seem subtle or even trivial, but it in fact has important practical implications." *Varma* J.A. 781 ¶ 21. Dr. Savage made a similar point, describing "an asset category such as an S & P Index Fund [a]s itself an asset." *Varma* J.A. 730 ¶ 17. There is no identified record basis for a contrary understanding. Because the S & P 500 index is consistently treated as a single asset, Sortino's analysis of the S & P 500 index alone cannot meet the two-or-more-investments claim limitation.

On the other hand, we do not reverse the cancellation of the claims that involve this claim limitation. One reason is that paragraphs 20 and 22 of Dr. Sortino's declaration raise a question—which we do not answer—about whether the prior-art Sortino article might teach or suggest a single resampling analysis of at least two assets. To be sure, in the Sortino article itself, the figures relate only to a single asset category,

the S & P 500 index; and the article states that the "statistics support our earlier claims about the shape of uncertainty for the S & P 500 and these results held for all nine asset categories studied," with no statement as to carrying out any single bootstrap analysis of at least two asset categories together. *InvestPic* J.A. 216; *Varma* J.A. 288. But in his declaration, Dr. Sortino said the following, seemingly about the work supporting his article:

> The asset allocation model we developed at this time and which was marketed to a number of firms used stocks and bonds from different countries. In both cases it is important to estimate the correlations between the *asset categories* and create a variance-covariance matrix. While we estimated covariance and correlation between the asset categories (e.g., stocks, bonds) we did not want to, need to, and did not, estimate the much more complex correlation and covariance relationships between all the underlying individual securities (individual stocks, bonds or other financial instruments within the portfolios).

InvestPic J.A. 294–95 ¶ 20; *Varma* J.A. 780–81 ¶ 20 (emphasis in original). Dr. Sortino added that "for asset allocation we only needed to measure the covariance between the overall asset *categories* (e.g., the entire S & P, Japan, etc.)." *InvestPic* J.A. 295 ¶ 22; *Varma* J.A. 781 ¶ 22 (emphasis in original).

The Board did not rely on those paragraphs of the Sortino declaration. *InvestPic*, 2015 WL 1456097, at

*3–4; *Varma*, 2014 WL 7186800, at *2–3. We will not address in the first instance the meaning and legal significance of those passages, or whether reliance on them at this stage is procedurally appropriate. We leave such questions to the Board on remand. *See Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1366–67 (Fed.Cir.2015).

Varma also challenges the adequacy of the Board's analysis regarding the obviousness rejections of claims 22, 23, 25, and 29–31. We do not address that challenge, because we are independently vacating and remanding for the Board to reconsider those claims in light of the proper claim construction. We also do not address the examiner's alternative grounds of rejection of claims 29–31 based on Barraquand. The Board stated that it was not reaching those grounds. *InvestPic*, 2015 WL 1456097, at *6. Whether to reach to those grounds, and, if so, whether they are sound, are determinations to be made in the first instance by the Board on remand.

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Varma challenges the Board's understanding of "resampled statistical analysis," a term that appears in all claims at issue.[3] Varma suggests that the term refers to "a statistical analysis using resampling of data involving multiple investments for multiple time

[3] Claims 1–5 and 8–10 use the term "re-sampled statistical method," but Varma treats the terms as equivalent. Brief for Appellant, InvestPic LLC at 35, *InvestPic LLC v. IBM* (No. 2015-1667).

periods, wherein the interrelationships in the financial data are preserved." Brief for Appellant, InvestPic LLC at 35, *InvestPic LLC v. IBM* (No.2015-1667); Brief for Appellant, Samir Varma at 37, *In re Varma* (No.2015-1502). That proposed construction goes far beyond the language supposedly being construed, which refers to a statistical technique that indisputably may be used for analysis outside the financial context altogether and, indeed, may be used for single-investment analysis, as many of the patent claims at issue here make clear. We reject Varma's narrowing construction of "resampled statistical analysis."

CONCLUSION

We reverse the Board's rejection of claims 1–5, 8–16, 19–21, and 24. We vacate the Board's rejection of claims 22, 23, 25, and 29–31 and remand for further proceedings regarding those claims.

Costs awarded to InvestPic in No.2015-1667.

REVERSED IN PART, VACATED IN PART, AND REMANDED