

Exhibit No.:
Witness: Steven Schwartz
Type of Exhibit: Surrebuttal Testimony
Issues: Noranda Economic Impact
Sponsoring
Party: Noranda Aluminum, Inc.
Case No.: ER-2014-0258

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

Filed
March 24, 2015
Data Center
Missouri Public
Service Commission

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In the Matter of Union Electric
Company, d/b/a Ameren
Missouri's Tariff to Increase Its
Revenues for Electric Service
)
)

Case No. ER-2014-0258

Surrebuttal Testimony of Steven Schwartz

NON-PROPRIETARY (NP) VERSION

On behalf of

Noranda Aluminum, Inc.

February 6, 2014

Noranda Exhibit No. 611
Date 3-12-15 Reporter KF
File No. ER-2014-0258

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

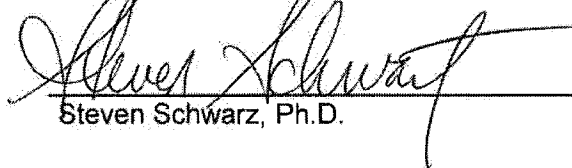
In the Matter of Union Electric
Company d/b/a Ameren
Missouri's Tariff to Increase its
Revenues for Electric Service

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) Case No. ER-2014-0258
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Affidavit of Steven Schwartz, Ph.D.


Steven Schwartz, Ph.D., being first duly sworn, on his oath states:

1. My name is Steven Schwartz. I am Managing Director at Alvarez & Marsal Global Forensic and Dispute Services, LLC having its principal place of business at 600 Madison Avenue, 10th Floor, New York, NY 10022.
2. Attached hereto, and made a part hereof for all purposes, is my surrebuttal testimony, which was prepared in written form for introduction into evidence in Missouri Public Service Commission Case No. ER-2014-0258.
3. I hereby swear and affirm that the testimony is true and correct.



Steven Schwarz, Ph.D.

Subscribed and sworn to before me this 6th day of February, 2015.



Notary Public

MARLO NAVARRO
Notary Public of New York
New York County
Reg. # 01NA5073516
Expires February 24, 2015

**Before the
Missouri Public Service Commission**

Case No. ER-2014-0258

Prepared Surrebuttal Testimony of Steven Schwartz

1 **Q. Please state your name, employer and business address.**

2 **A.** My name is Steven Schwartz. I am an economist and Managing Director with
3 Alvarez & Marsal, with a business address of 600 Madison Avenue, New York, NY.

4

5 **Q. Have you previously filed testimony in this matter?**

6 **A.** Yes. I filed testimony on behalf of Noranda in late December 2014 as a part of
7 Noranda's affirmative presentation to the Public Services Commission.¹

8

9 **Q. Did that submission include a resume reflecting your educational
10 background and work experience?**

11 **A.** Yes, it did. My resume was attached to that testimony as an exhibit. The resume
12 describes my education, work history and experience and identifies the expert
13 reports I have written and the matters in which I have offered testimony. I am
14 incorporating my earlier direct testimony by reference in this report.

15

16 **Q. Since your last testimony in this matter, has your resume changed?**

¹ Direct Testimony of Steven Schwartz *In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service* Before the Missouri Public Services Commission, Case No. ER-2014-0258, December 2014.

1 A. There have been additional reports and testimony since that submission, but there
2 have been no other changes in my employment history or education. A copy of my
3 updated resume is attached to this testimony as Exhibit 1.

4
5 Q. Subsequent to your submission of direct testimony on behalf of Noranda,
6 have you done any further analysis in connection with your assignment in
7 this proceeding?

8 A. Yes. I have reviewed a number of the rebuttal expert reports filed in this case,
9 especially the testimony filed by Mr. Mudge and Mr. Humphreys. I have had
10 additional discussions with Noranda personnel, reviewed additional material from
11 Noranda, and I have undertaken an analysis of that additional material. In
12 particular, my analysis has focused on analyzing and responding to the relevant
13 criticisms and commentary by Mr. Mudge (the "Mudge Testimony")² and Dr.
14 Humphreys (the "Humphreys Testimony")³ regarding the opinions set forth in my
15 initial direct testimony. I have also reviewed the testimony filed by a number of the
16 witnesses testifying on behalf of Noranda in this matter.

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² Rebuttal Testimony of Robert S. Mudge on Behalf of Union Electric Company d/b/a Ameren Missouri, Missouri Public Services Commission, File No. ER-2014-0258, January 2015.

³ Rebuttal Testimony of David Humphreys on Behalf of Union Electric Company d/b/a Ameren Missouri, Missouri Public Services Commission, File No. ER-2014-0258, January 2015.

1 **Q. What have you been asked to do in this sur-rebuttal testimony?**

2 **A.** In this testimony, I was asked to outline my responses to the comments and
3 criticisms directed at my opinions by Mr. Mudge and Dr. Humphreys.

4

5 **Q. Have you done that?**

6 **A.** Yes, I have.

7

8 **Q. And have you formed any conclusions about the specific criticisms offered**
9 **by Mr. Mudge and Dr.. Humphreys that are relevant to your work?**

10 **A.** Yes, I have.

11

12 **Q. Can you summarize those conclusions?**

13 **A.** As a general matter, Mr. Mudge's criticisms are misplaced or fundamentally
14 incorrect. His criticisms are based on vague or undefined criteria and are
15 unsupported by sound economic analysis. In the case of aluminum price
16 forecasts, his conclusions are simply wrong. In response to Mr. Mudge's criticism
17 of how I have used Noranda's aluminum price forecasts, I have undertaken further
18 sensitivity analysis with respect to scenarios for the aluminum price, which further
19 bears out the robustness of the conclusions I offered in my initial report. I disagree
20 with Mr. Mudge's claims about the way lenders would use alternative scenarios for
21 aluminum prices. Finally, I disagree with Mr. Mudge's blithe assurance that
22 Noranda will be able to raise new funding in the debt and equity markets, in spite of
23 changes in external economic conditions.

1 Q. You also indicated that you have analyzed Dr. Humphreys' report in
2 connection with certain parts of his testimony that implicate your initial
3 analysis. Specifically, what have you done with respect to Dr. Humphreys'
4 analysis?

5 A. Dr. Humphreys offers a variety of specific criticisms of the approach adopted by
6 Noranda in its price forecasts that are relevant to my analysis. He claims
7 Noranda's aluminum price forecasts are flawed and unreliable because they do
8 not conform to the CRU forward forecast, which he regards as the sole rational
9 forecast. As I explain below, for purposes of analyzing the impact of the electric
10 rates proposed by Ameren on Noranda's financial viability, Noranda's approach is
11 reasonable and use of the CRU forward curve will yield misleadingly optimistic
12 results. Indeed, use of the CRU forward curve for purposes of this analysis is the
13 ultimate example of cherry-picking a forecast so as to get the desired result.

14

15 Q. Let's go through these individually. Why do you reject Mr. Mudge's
16 criticism of you for relying on Noranda's forecasts of aluminum prices?

17 A. The criticism is a straw man. It is often the case that an expert is asked to make
18 certain factual assumptions for purposes of an analysis. It is neither unusual nor
19 uncommon for an economist in a circumstance like this one to take, as a given,
20 assumptions about prices or other firm or market factors. That is all I did here.
21 Thus, Mr. Mudge's criticism is a *non sequitur*. Indeed, in his acceptance of Dr.
22 Humphreys' conclusion about the supposed superiority of the CRU forward

1 forecast for purposes of this analysis, Mr. Mudge has done exactly the same thing
2 I did.

3
4 **Q. Mr. Mudge also criticizes you for not verifying or validating Noranda's**
5 **forecasts. Why do you reject this criticism?**

6 **A.** Mr. Mudge is being disingenuous. Knowing that I accept Noranda's price
7 forecasts for purposes of my analysis and that the burden of explaining and
8 supporting those forecasts is Noranda's, there is no reason why I would verify or
9 validate Noranda's forecasts. So, while Mr. Mudge's statement is true, it is also
10 irrelevant.

11
12 **Q. Do you reject Mr. Mudge's criticism that your analysis is invalid because**
13 **you focus on a range of prices that is too narrow?**

14 **A.** Absolutely. Mr. Mudge's criticism is premised on some undefined concept of
15 "narrow". Mr. Mudge suggests that the range of prices is narrow, but he never
16 indicates what the definition of narrow is. He never indicates how close prices
17 must be for the range to be narrow. He fails to indicate the period of time over
18 which he purports to measure "narrowness". So, it is hard to respond directly to
19 the critique. That said, this critique seems merely to be a restatement—or a
20 different formulation—of Dr. Humphreys's criticism of the price forecasting method

1 adopted by Noranda. Indeed, the range of prices considered in my analysis has a
2 much wider variance than the CRU forecast propounded by Mr. Mudge.⁴

3
4 **Q. Dr. Humphreys and Mr. Mudge criticize the manner in which Noranda has**
5 **developed its aluminum price forecasts. Do you have an understanding of**
6 **the alternative that Dr. Humphreys and Mr. Mudge propose and their**
7 **rationale for that approach?**

8 **A.** Yes. Dr. Humphreys argues that the proper aluminum price forecast for evaluating
9 Noranda's financial condition is the CRU forward forecast. He argues that
10 because it is not possible to know precisely how prices will evolve or to locate
11 prices in the context of the price cycle, it is incorrect to do anything other than
12 accept the CRU price forecast as it is. Finally, he argues that the CRU price
13 forecast represents a "middle" case and implicitly builds in price volatility. Mr.
14 Mudge appears to accept Dr. Humphrey's arguments and to incorporate them
15 unchanged into his own opinion.

16
17 **Q. Do you agree with the view expressed by Dr. Humphreys?**

18 **A.** No. As an economic matter, Dr. Humphreys's conclusion is not sensible. First, his
19 argument completely ignores the purpose for which the aluminum price series are
20 used in this case. Second, he provides no evidence or economic basis for his

⁴ I note with interest that, for all of his criticisms of me for my failure to produce my own independent forecast of aluminum prices, Mr. Mudge also fails to prepare such an analysis. In fact, he relies on and adopts the criticisms of Dr. Humphreys and accepts Dr. Humphreys's view of the correct aluminum price forecast. As I note above, I find it interesting and telling that Mr. Mudge adopts the same approach that he criticizes.

1 assertion that the CRU forward series somehow embodies or reflects the
2 underlying volatility of aluminum prices. The forward series takes, as a starting
3 point, the price trend from the preceding periods. But a price trend, by its nature,
4 smooths out volatility. By definition, it ignores year-to-year variation (i.e., volatility),
5 in order to project a set of prices going forward. It captures only the directional
6 movement of prices. With a trend line, we know that it is overwhelmingly likely that,
7 in any given year, the projected price will be wrong. Rather than accounting for
8 any underlying volatility, the CRU forward forecast statistically removes it. His
9 assertion that the CRU forecast somehow incorporates volatility is disingenuous.
10 Since there is no variance in the CRU forecast, it does not incorporate volatility at
11 all, and the CRU forecast represents a single, fixed scenario. That means that the
12 prices in the CRU forecast are not appropriate for purposes of *this* analysis.

13
14 **Q. Can you explain what you mean?**

15 **A.** We are asking whether Noranda's viability is challenged as a result of the rate
16 proposal advanced by Ameren. In order to obtain a meaningful answer to that
17 question, we have to consider outcomes which deviate from the CRU forecast,
18 particularly outcomes which deviate on the downside.

19
20 **Q. Why?**

21 **A.** Given Noranda's current financial condition, its prospects will be very different
22 depending on the path that prices follow. That is why the CRU forecast will
23 necessarily yield misleading results. The assumption of steadily increasing prices

1 will paint an unduly positive picture of Noranda's financial situation, and thus will
2 lead to a misleading conclusion about the impact of the Ameren rate proposal on
3 Noranda. Relying on a single forecast in which prices rise steadily rules out the
4 possibility that lower realized aluminum prices will threaten Noranda's financial
5 viability.⁵

6
7 **Q. In your opinion, does Dr. Humphreys's reliance on the CRU forward curve**
8 **bias his conclusions?**

9 **A.** Absolutely. The use of the CRU forward curve drives his conclusion and, in turn,
10 Mr. Mudge's.

11
12 **Q. Mr. Mudge also suggests that no rational lender would evaluate Noranda's**
13 **credit worthiness using a forecast of the type advanced by Noranda.**
14 **Instead, he suggests that lenders will use the CRU forward curve. Do you**
15 **agree with that conclusion?**

16 **A.** Absolutely not.

17
18 **Q. Why not?**

19 **A.** A potential lender will be concerned with the likelihood of a borrower being able to
20 repay its loan. It will be looking to the indicia of a firm's ability to do that, such as
21 free cash flow. To get a good estimate of what free cash flow is likely to be going

⁵ Note that if the CRU forecast predicted steadily *declining* prices, it would still be wrong to use that CRU forecast in an analysis of the impact of Ameren's rate proposal on Noranda's viability. That forecast would yield misleadingly negative inferences. In short, for purposes of answering the relevant question in this matter, use of the CRU forward curve will lead to misleading inferences.

1 forward, lenders will be focused on future revenues and profitability. Therefore, it
2 will want—among other things—reasonable estimates of future prices. It will seek
3 price forecasts that are neither unreasonably optimistic nor pessimistic. The CRU
4 forward curve forecast would be rejected. Lenders want to be assured that they
5 will be repaid under a variety of possible outcomes for aluminum prices.
6 Accordingly, they will consider a variety of aluminum price scenarios when making
7 a lending decision. A reasonable price scenario which threatens the company's
8 ability to repay the loan would be taken very seriously by a lender. More
9 reasonably, in Noranda's case, a lender would want a forecast that reflects a price
10 path that captures price movements—up and down—because Noranda's future
11 financial condition depends importantly on that path. The CRU forward curve is
12 not such a forecast.

13
14 **Q. Mr. Mudge also criticizes your conclusion that Noranda will likely be unable**
15 **to refinance its debt in 2017 or later. He argues that because Noranda was**
16 **able to obtain debt and equity financing previously, there is no reason to**
17 **believe that it would be unable to do so again. Why do you disagree with Mr.**
18 **Mudge?**

19 **A.** His argument is akin to me saying that because I was once able to play college
20 hockey, I am going to be able to do so again. Of course, 40 years have passed
21 since I last played and there have been some changes over time that would keep
22 me from doing so. Put differently, the fact that I was able to do something in the
23 past does not predict my ability to do that in the future because circumstances

1 change. Such is the case with Noranda. Its ability to borrow is based on its current
2 financial condition and its expected future prospects. There is no necessary
3 relationship between its financial condition and prospects today and the financial
4 condition and prospects prevailing as of its previous borrowings. As Noranda's
5 circumstances change and business conditions also change, its attractiveness as
6 a borrower or to an equity investor changes. Past ability to obtaining debt or equity
7 financing says nothing about future abilities.

8
9 **Q. Did you do anything to test the sensitivity of your conclusions to the**
10 **forecasts that were chosen by Noranda?**

11 **A.** Yes.

12
13 **Q. Please explain what you did?**

14 **A.** The first thing I did was to explore whether the economic evidence is more
15 consistent with near term price increases or near-term price declines.

16
17 **Q. Why does that matter?**

18 **A.** Mr. Mudge and Dr. Humphreys question whether there is any basis for knowing
19 where we are in the current aluminum price cycle. If I assume they are correct, for
20 purposes of this analysis, that still does not rule out the possibility of knowing
21 whether we are on the downward or upward portion of the price path. Second, the
22 analysis allows me to assess the scenarios considered by Noranda and judge, at
23 least, which are more or less likely to emerge.

1 **Q. Can you explain what you did?**

2 **A.** First, I looked to see what trends are evident in the production and consumption of
3 primary aluminum. The World Bureau of Metals Statistics collects monthly data on
4 the worldwide production and consumption of primary aluminum. Since January
5 2008, production of aluminum has exceeded consumption of aluminum in 65 out of
6 83 months of reported data.

7
8 **Q. Why is that relevant?**

9 **A.** The most important indicator of the likely direction of prices is the balance between
10 supply and demand. The supply of aluminum at a point in time depends on
11 manufacturing capacity and the level of available inventories, that is, the amount of
12 aluminum left over after consumption demands are satisfied.

13
14 **Q. What happens when production consistently exceeds consumption?**

15 **A.** Surpluses accumulate. Aluminum that is produced but not consumed is
16 inventoried, adding to the worldwide stocks of aluminum. Since January 2008, the
17 worldwide aluminum market has added a cumulative surplus of more than 9 million
18 metric tonnes of aluminum. That surplus would be enough to satisfy world
19 aluminum demand for more than two months if all aluminum production were to
20 suddenly cease. Given that there were some stocks of aluminum already in
21 existence as of January 2008, total stocks are even greater than the surplus that
22 has been developed.

23

1 **Q. Why did you start your analysis in January 2008?**

2 **A.** The LME three-month aluminum price reached its peak in 2008. In the run-up to
3 the peak in prices, the aluminum market responded to increasing prices by adding
4 productive capacity, as economists would expect. Looking at totals since 2008
5 captures the cumulative effect of the new capacity added by the industry.

6

7 **Q. What do accumulated surpluses imply for the future path of aluminum**
8 **prices?**

9 **A.** When stocks of a commodity are high it is hard for prices to rise by much. When
10 demand exceeds supply in the short term, one of two things can happen. Either
11 the price of the commodity will rise to ration lower-value buyers out of the market,
12 or excess demand will be met out of inventories. Since the current level of
13 aluminum inventories can absorb a lot of excess demand, the likelihood of rising
14 prices is diminished.

15

16 **Q. Can other factors limit aluminum price rises in the intermediate term?**

17 **A.** Because of variations in input prices – particularly variations in electricity prices
18 around the world – aluminum smelters are profitable at different levels of the
19 aluminum price. Put differently, for a given aluminum price, not all aluminum
20 smelters will be profitable. Those smelters with the highest marginal costs will tend
21 to idle their capacity, if possible, as prices decline. As a result, if aluminum prices
22 were to rise significantly, idle productive capacity could come back online,

1 increase supply and defeat pressure for prices to increase. The existence of idle
2 capacity can also tend to push prices down.

3

4 **Q. In summary, then, what expectations do you have for aluminum prices over**
5 **the next few years?**

6 **A.** The factors discussed above suggest it is unlikely that aluminum prices will
7 increase over the next few years. Ample inventories and idle capacity in the
8 industry could meet any near-term increase in demand. Only a major positive
9 demand shock could create upward pressure on prices. Given muted prospects
10 for economic growth worldwide, it is hard to say why such a shock would
11 materialize. That suggests that an upward price path in the near-term is unlikely.

12

13 **Q. What other Noranda price scenarios did you review?**

14 **A.** I asked Noranda to provide me with the full set of aluminum price scenarios it
15 considered in connection with its price forecasting analysis. Noranda considered
16 eleven pricing scenarios. This set included the scenarios that I considered in my
17 direct testimony. The complete set of scenarios is attached to this testimony as
18 Exhibit 2.

19

20 **Q. Can you describe generally these scenarios?**

21 **A.** ** _____
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Q. Based on your analysis, do these seem like scenarios that are likely to occur?

A. ** _____

_____ **

Q. What are the other scenarios?

A. ** _____

_____ **

Q. Do you have any opinions about which of these scenarios are most likely to be realized, going forward?

A. I believe that the scenarios that show near-term price declines are much more likely to be realized than those with near-term price increases, as I discussed previously.

1 Q. Can you summarize your conclusions from your analysis of the additional
2 scenarios?

3 A. ** _____
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19 Q. Are Noranda's prospects improved, in this scenario, under its proposed
20 alternative rate?

21 A. ** _____
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Q. Do you think the 1997 scenario is a likely one?

A. **

**

Q. What about the remaining scenarios?

A. **

**

Q. Are Noranda's prospects better under its proposed rates?

A. **

**

1 Q. Recalling the criticisms of your direct testimony that were offered by Mr.
2 Mudge, how does the analysis that you have just discussed respond to
3 those criticisms?

4 A. In my opinion, the analysis set forth above makes it clear that whatever the merits
5 of Mr. Mudge's criticism about the "narrowness" of the range of prices in the
6 scenarios I considered or of the reliability of the price forecasts themselves, my
7 conclusions as set forth in my direct testimony remain unchanged. The
8 conclusions are not sensitive to the choice of scenario, so long as we consider only
9 those scenarios that are economically realistic. The unduly optimistic forecasts
10 that are based on the 1994, 1995 and 1996 volatility curves ought to be dismissed.
11 They each project price paths that are, based on inventory and excess capacity
12 levels, sufficiently unlikely to occur that they can be dismissed. ** _____
13 _____
14 _____
15 _____
16 _____

17 _____ **

18
19 Q. Does this complete your testimony?

20 A. Yes.

NP



EXHIBIT 1

Steven Schwartz, PhD

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Professional History

NERA Economic Consulting,
(1984 – 2011)
Miami University (1980 – 1984))
Federal Trade Commission (1979 - 1980)
Coalition of Northeastern Governors
(01/1979)
Consulting Economist (06/1979)

Education

University of Maryland,
PhD in Economics
MA in Economics
Wesleyan University,
BA with Honors in Economics

Professional Activities

Associate Member,
American Bar Association

Fellowships and Awards

Outstanding Young Men of America (1978)
Lilly Post-Doctoral Fellowship (1981 –
1982)

Dr. Schwartz specializes in antitrust, intellectual property, valuation, and damage estimation matters. He has performed numerous antitrust analyses in connection with private antitrust litigation and merger investigations. He has particular expertise in analyzing the economics of vertical relationships. Dr. Schwartz has analyzed the competitive implications of a variety of restrictions on distributor behavior (e.g., product or territorial exclusivity) and incentive programs designed by suppliers to encourage certain types of behavior by distributors (e.g., co-op advertising programs). Dr. Schwartz has also undertaken many analyses arising out of allegations of illegal price discrimination, on both liability and damages questions. In addition, he has been involved in a variety of cases at the intersection of antitrust and intellectual property issues. Dr. Schwartz has measured damages in antitrust and commercial disputes and he has testified as an expert witness on both antitrust liability and antitrust damage issues in a number of Federal Courts, the International Trade Commission and arbitration proceedings.

Dr. Schwartz has extensive experience analyzing competition in both consumer goods industries (e.g., soft drinks, pet foods and other grocery products) and manufacturing industries (e.g., including steel fabrication, polyester fiber, and semi-conductor manufacturing components).

Dr. Schwartz also has extensive experience in Lanham Act matters. He has estimated damages in both trademark infringement and false advertising matters. Dr. Schwartz is also an expert in intellectual property matters. He has undertaken numerous investigations of the damages associated with alleged patent infringement. He has also advised clients on the value of their intellectual property portfolios and licensing strategies with respect to intellectual property. Dr. Schwartz has also appeared as an expert in the United States Tax Court in matters involving tax-related disputes about the value of intellectual property, including trademarks and other intangibles. He has also testified as an expert in Federal Court in intellectual property litigation, measuring damages in patent infringement cases.

Dr. Schwartz has published articles in economics journals concerning mergers, the persistence of monopoly profits, and arbitrator bias. He has also co-authored papers for the Practising Law Institute. He has

also made presentations to a variety of competition groups on a variety of competition issues and the intersection of intellectual property and competition economics.

From 1980-1984, Dr. Schwartz served as an Assistant Professor of Economics at Miami (Ohio) University and as an antitrust economist in the Bureau of Economics at the Federal Trade Commission.

Testimony and Affidavits

- Deposition Testimony of Steven Schwartz in *Virginia Forklift, Inc. v. Crown Equipment Corporation* in Arbitration Before JAMS, January 2015.
- Direct Testimony of Steven Schwartz *In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase its Revenues for Electric Service* Before the Missouri Public Service Commission, Case No. ER-2014-0258, December 2014.
- Trial Testimony in *Aloe Vera of America et al. v. United States of America* United States District Court for the District of Arizona, CIV-99-1794-JAT, July-August 2014.
- Trial Testimony in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, June 2014.
- Deposition Testimony in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09 and *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, February 2014.
- Deposition Testimony in *Aloe Vera of America et al. v. United States of America* United States District Court for the District of Arizona, CIV-99-1794-JAT, August 2013.
- Deposition Testimony in *Bristol-Myers Squibb Company v. Apotex, Inc. and Apotex Corp.*, United States District Court for the District of New Jersey, Civil Action No. 10-CV-5810, May 2013.
- Trial Testimony in *RegScan, Inc. v. The Bureau of National Affairs, Inc.*, United States District Court for the Eastern District of Virginia, Alexandria Division, Civil Action No. 1:11-cv-01129 (JCC-JFA), November 2012.
- Deposition Testimony in *Realtime Data, LLC d/b/a IXO v. Goldman Sachs*, United States District Court for the Southern District of New

York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF;
1:11-CV-6704-KBF, July 2012.

- Deposition Testimony in *Realtime Data, LLC d/b/a IXO v. J.P. Morgan Chase*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.
- Deposition Testimony in *Realtime Data, LLC d/b/a IXO v. Morgan Stanley, et al. (III)*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.
- Deposition Testimony in *RegScan, Inc. v. The Bureau of National Affairs, Inc.*, United States District Court for the Eastern District of Virginia, Alexandria Division, Civil Action No. 1:11-cv-01129 (JCC-JFA), May 2012.
- Deposition Testimony in *Jackson Hewitt, Inc. v. H&R Block, Inc., HRB Tax Group, Inc., and H&R Block Tax Services, LLC and HRB Tax Group, Inc. v. Jackson-Hewitt, Inc. and Jackson Hewitt Tax Service, Inc.*, United States District Court for the Southern District of New York, Civil Action No. 11-Civ-0641 (AKH), December 2011.
- Rebuttal Affidavit in *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, August 15, 2011.
- Rebuttal Affidavit in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, August 15, 2011.
- Affidavit in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, June 2011.
- Affidavit in *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, June 2011.
- Deposition Testimony in *CareFusion 213, LLC v. Professional Disposables International, Inc., and Nice-Pak Products, Inc.*, United States District Court for the District of Kansas, Civil Action No. 09-CV-2616 KHV/DJW, December 8, 2010.
- Trial Testimony in connection with Sudesh Agrawal's Motion for Class Certification in *Ford Motor Credit Company v. Sudesh Agrawal*, Cuyahoga County Court of Common Pleas, Case No. CV-04-536688, December 3, 2010.

- Trial Testimony in *Food Holdings, Ltd. and Dairy Holdings, Ltd. v. Bank of America*, United States District Court, Southern District of New York, 05CV9934, September 2009.
- Deposition Testimony in *CNET Networks, Inc. v. Etilize, Inc.*, United States District Court, Northern District of California, Case No. C 06 5378, Fall 2008.
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Steven Schwartz, PhD

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Steven Schwartz, PhD

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EXHIBITS 2 AND 3
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