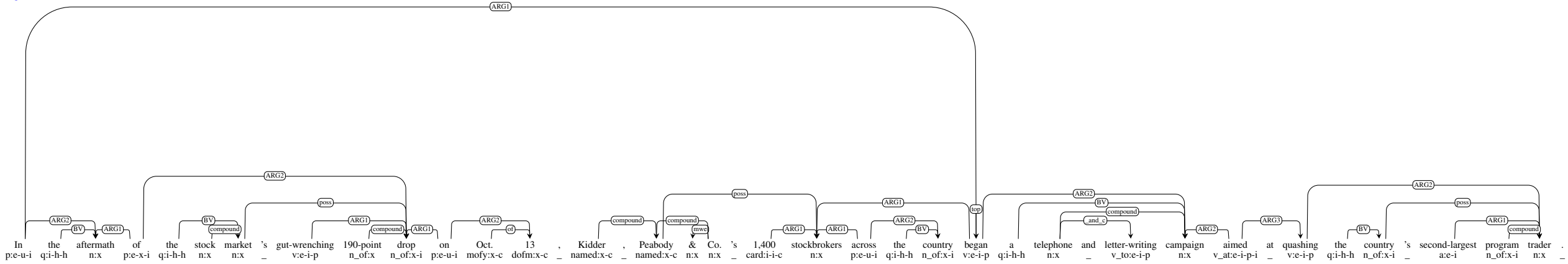
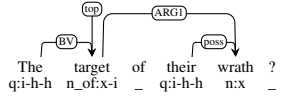


Document 0118

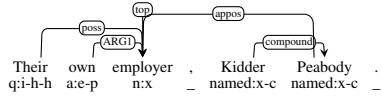
[20118001]



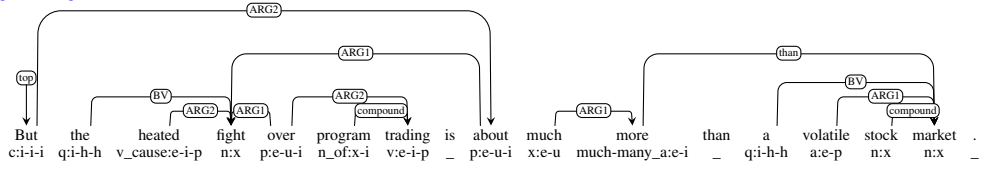
[20118002]



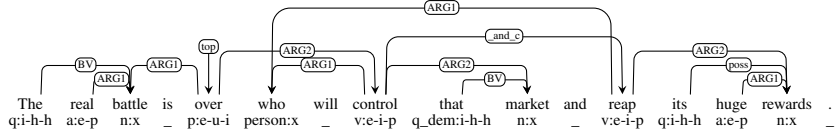
[20118003]



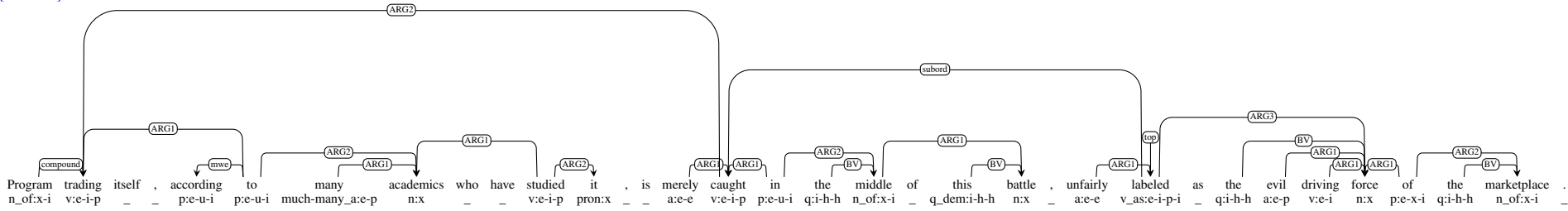
[20118005]



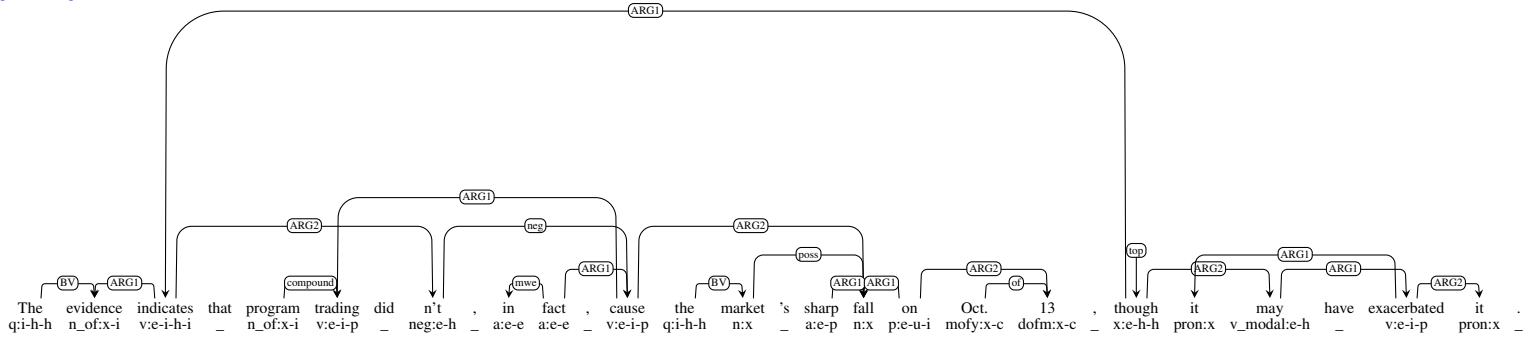
[20118006]



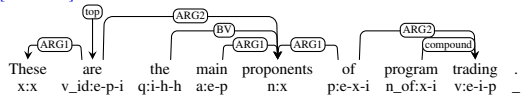
[20118007]



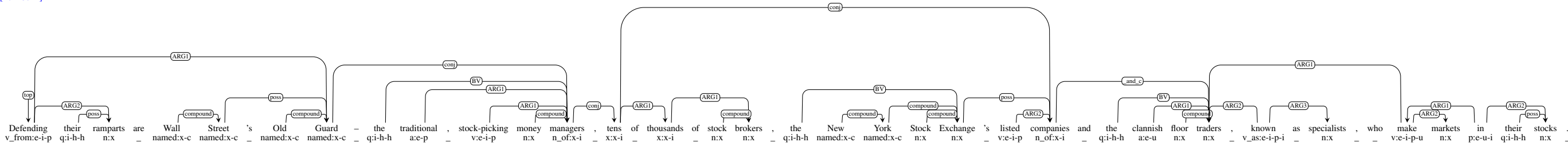
[20118008]



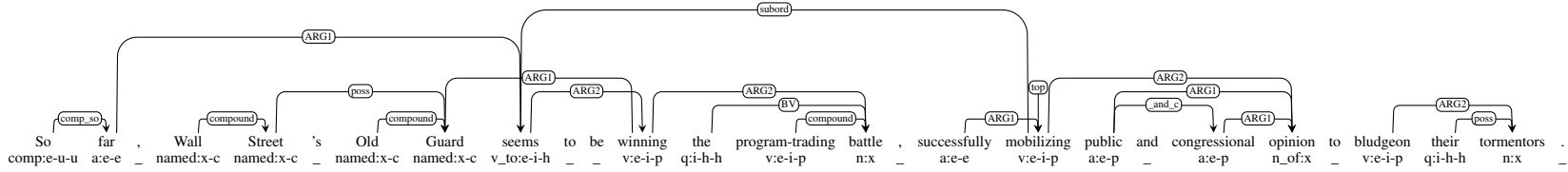
[20118010]



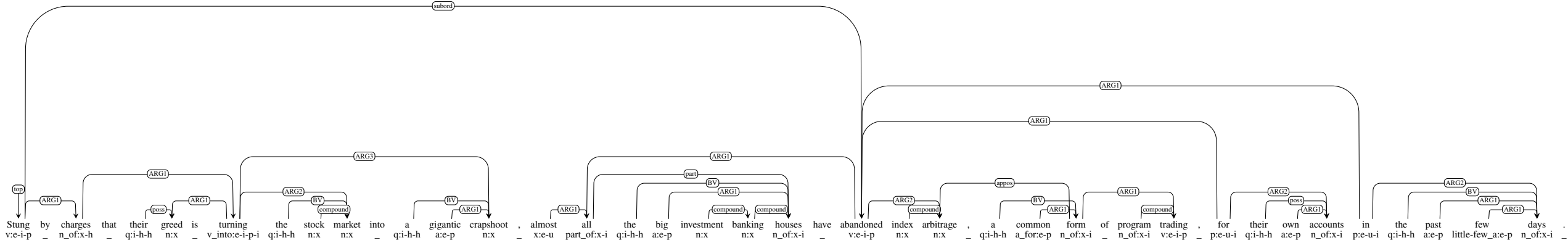
[20118011]



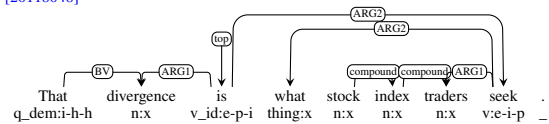
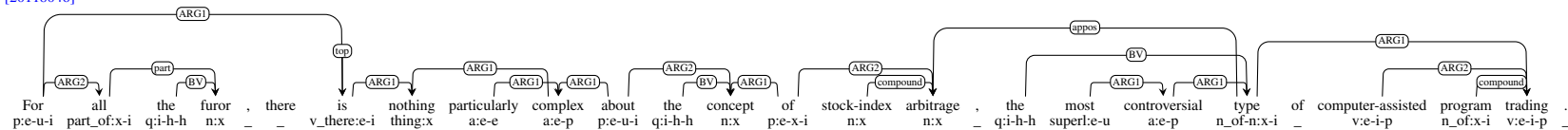
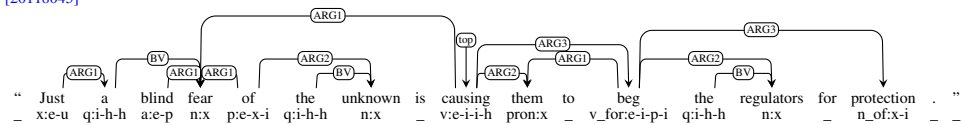
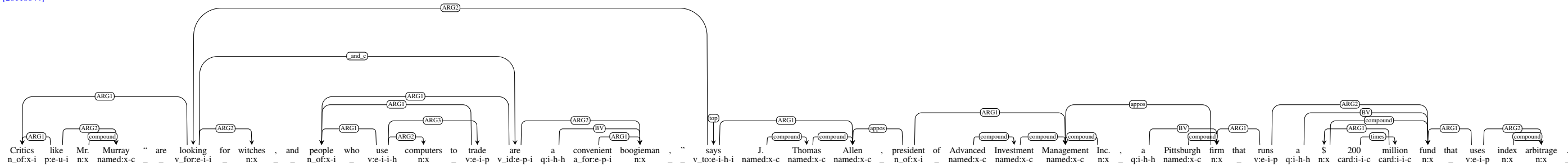
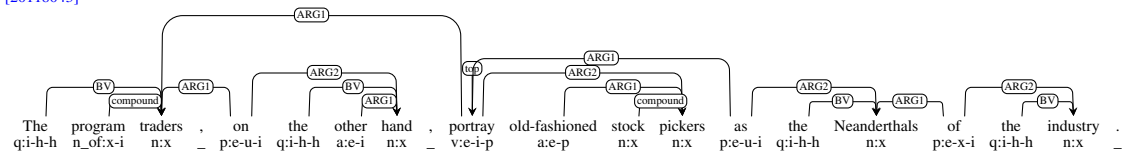
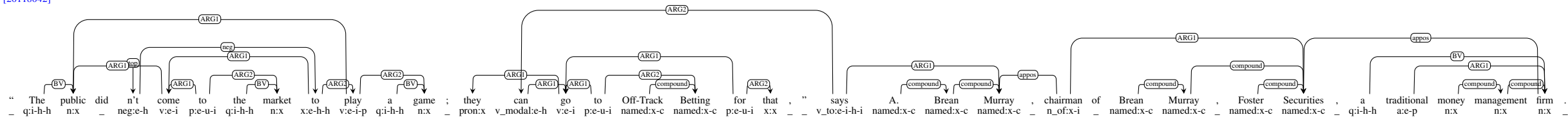
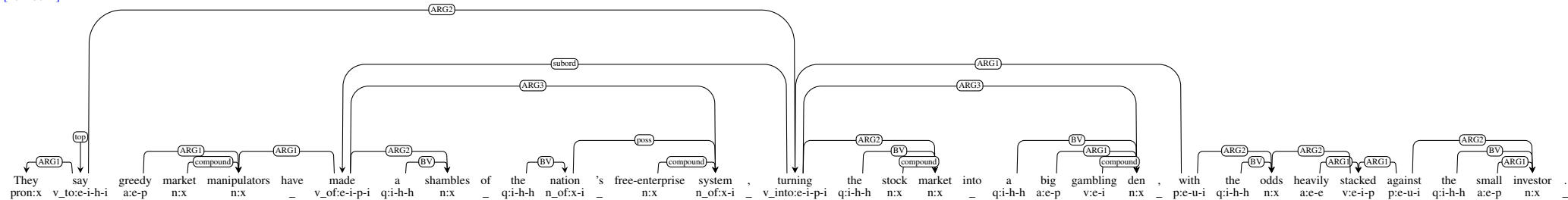
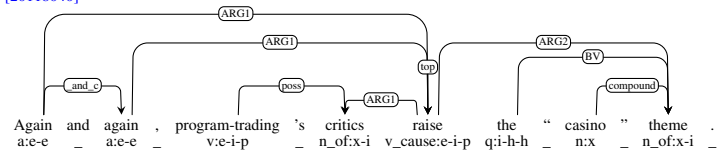
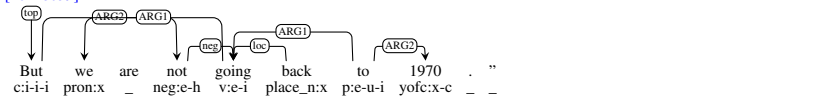
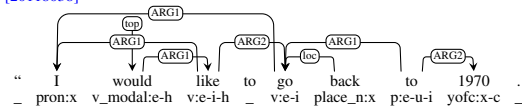
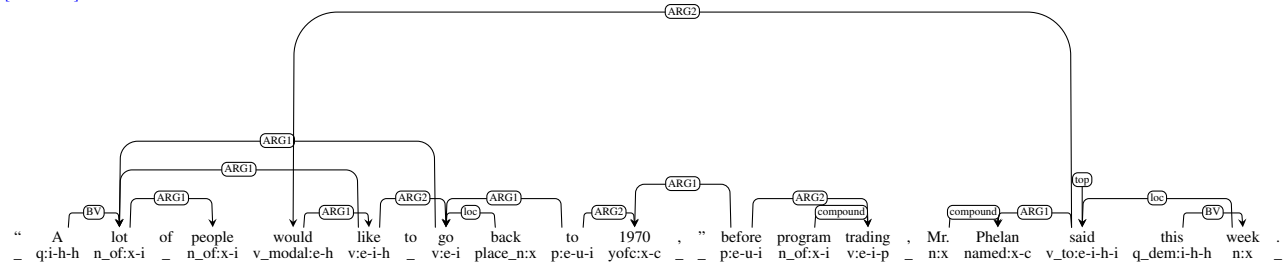
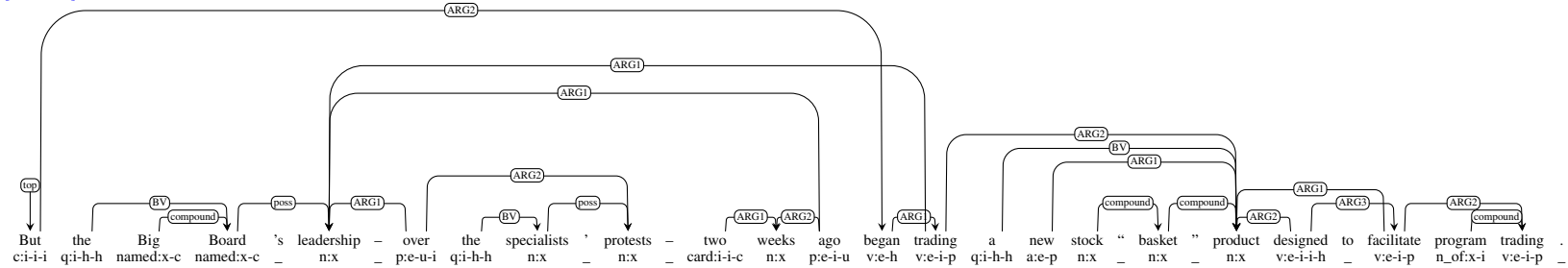
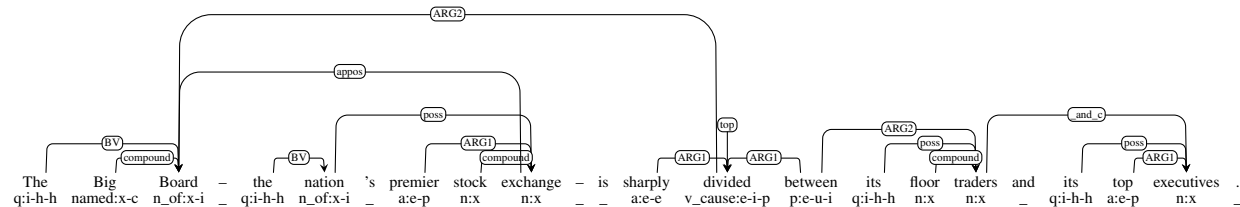
[20118012]

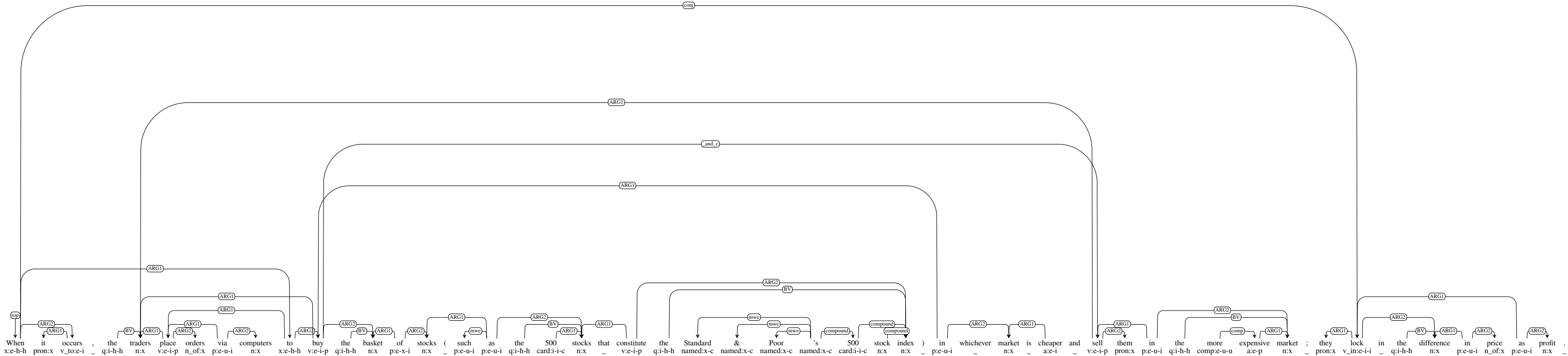


[20118014]

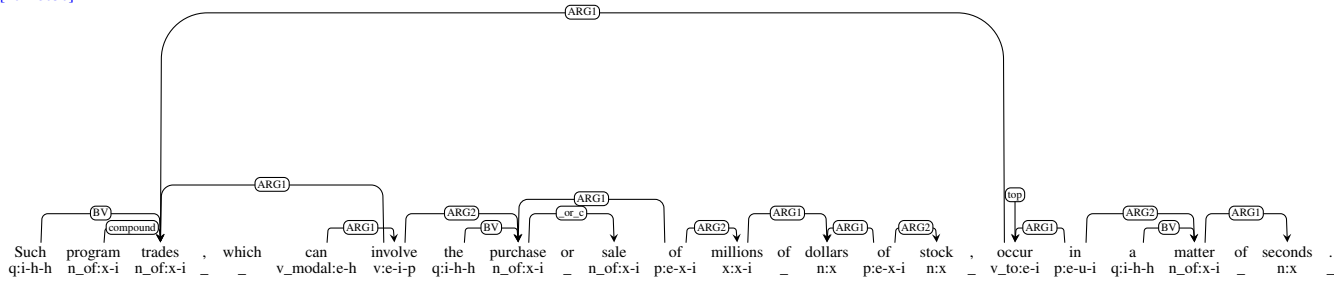


[20118015]

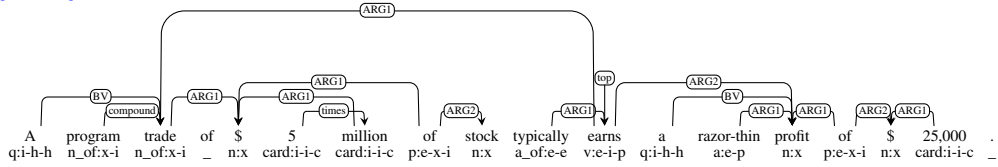




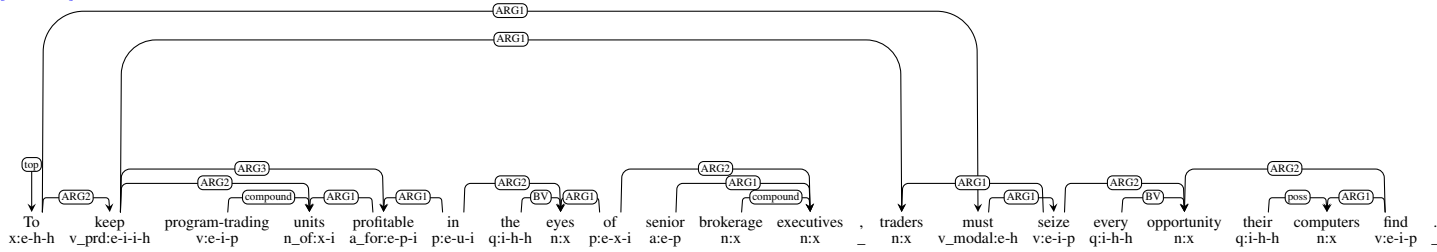
[20118050]



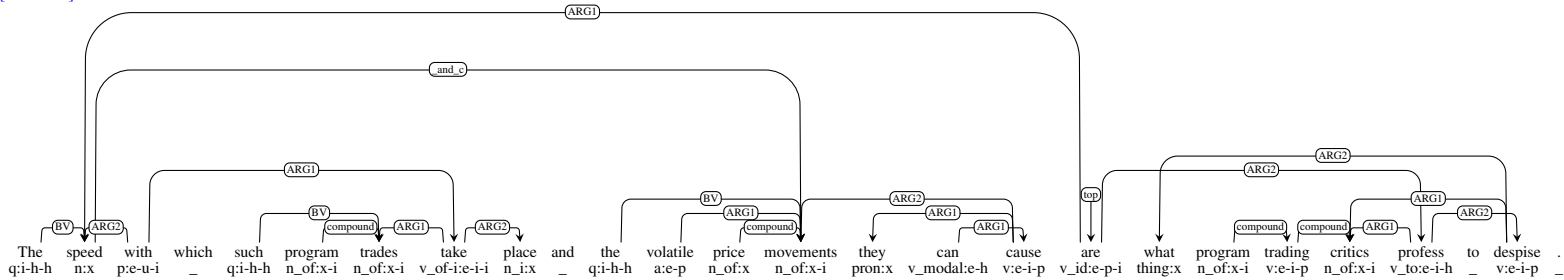
[20118051]



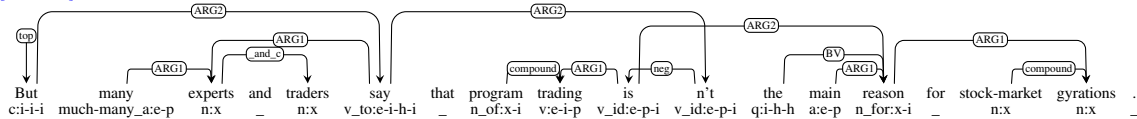
[20118052]



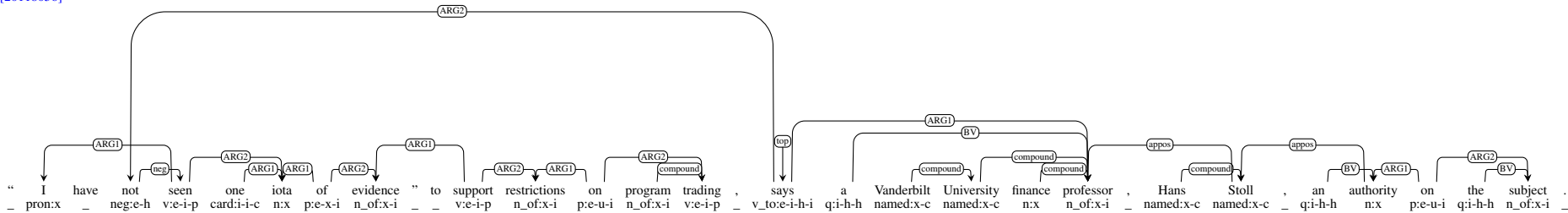
[20118053]



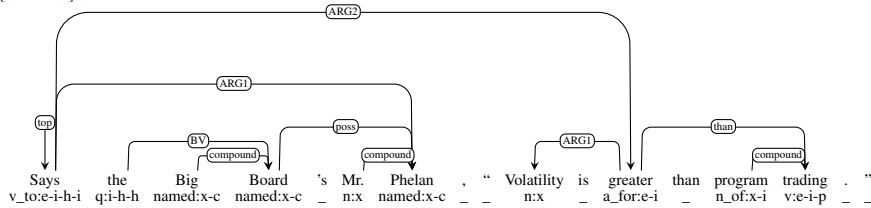
[20118055]



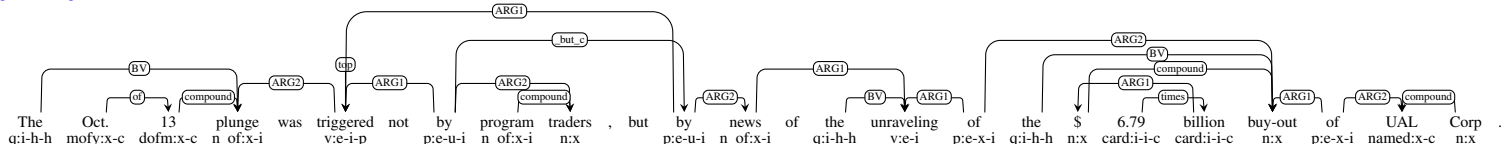
[20118056]



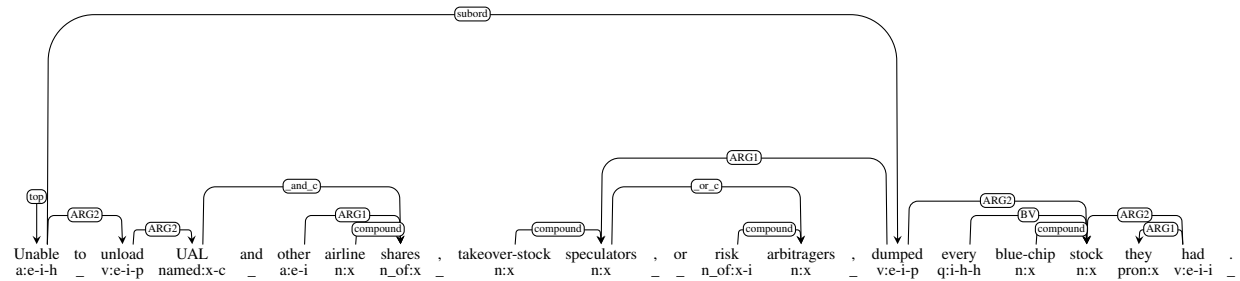
[20118057]



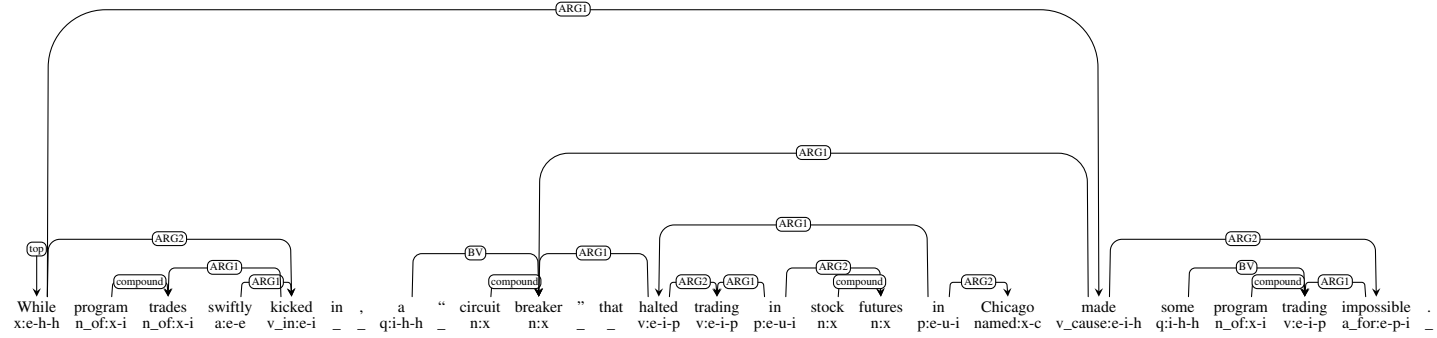
[20118058]



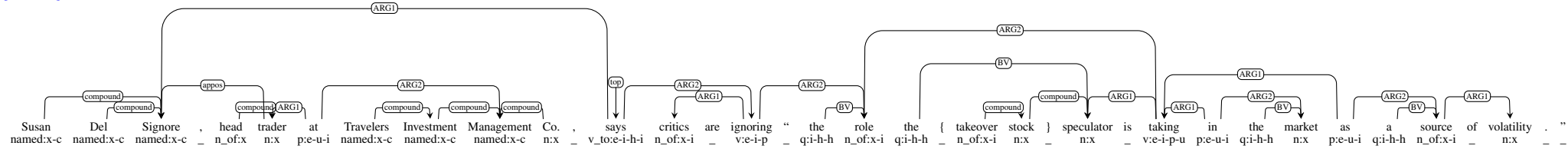
[20118059]



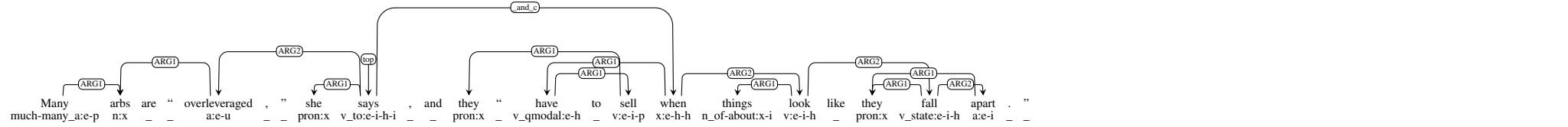
[20118060]



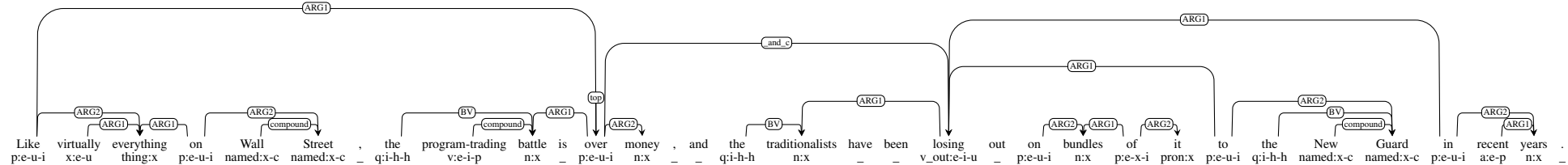
[20118061]



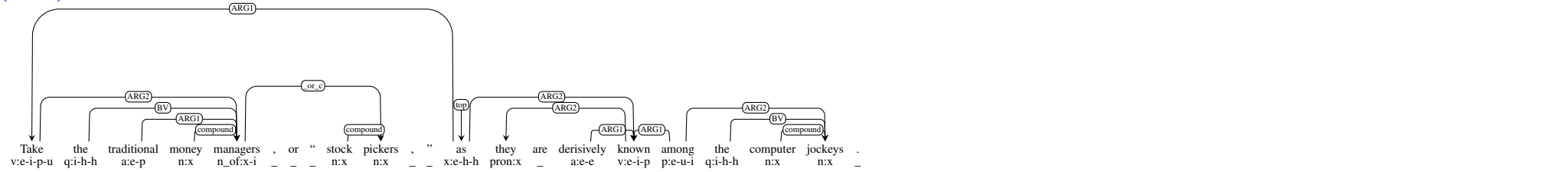
[20118062]



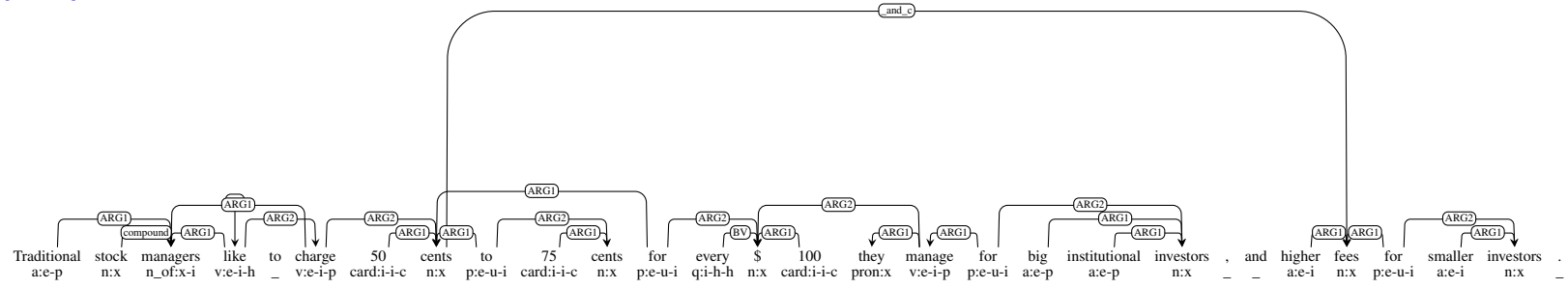
[20118063]



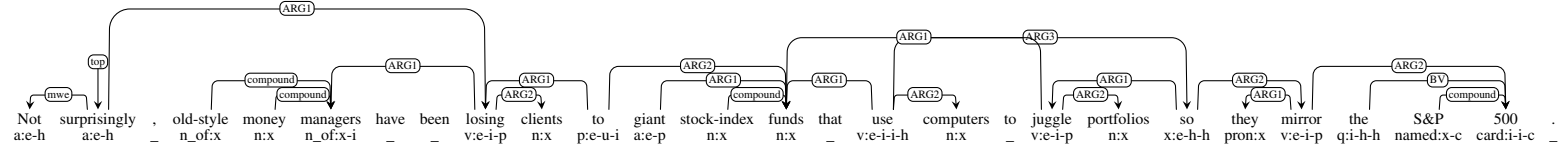
[20118064]



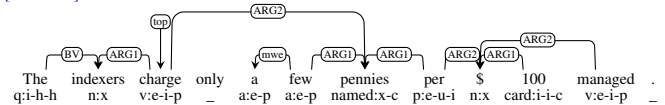
[20118065]



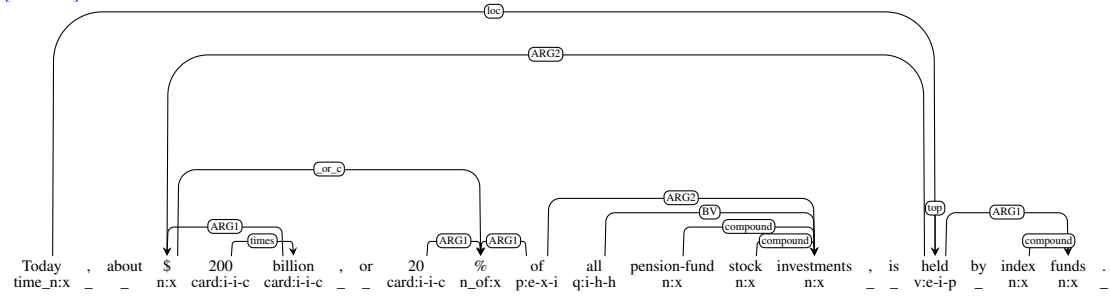
[20118067]



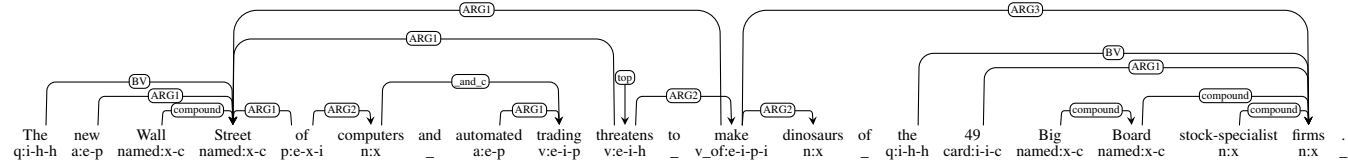
[20118068]



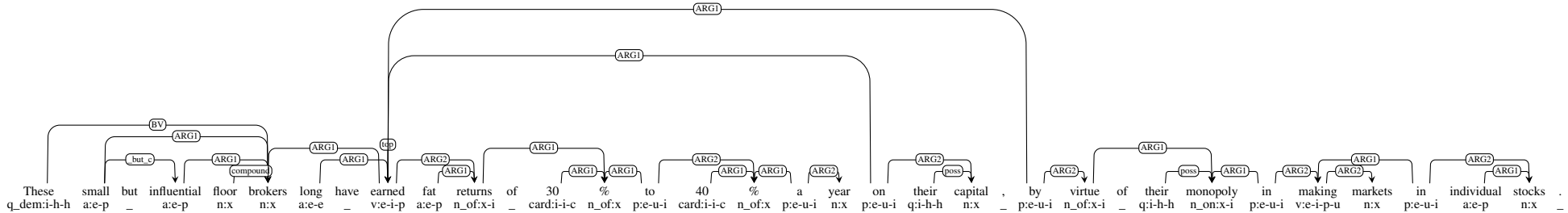
[20118069]



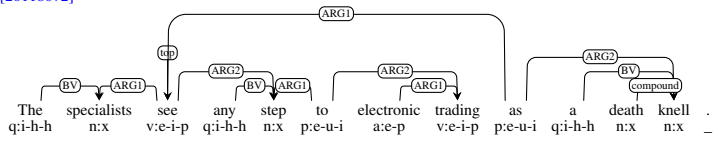
[20118070]



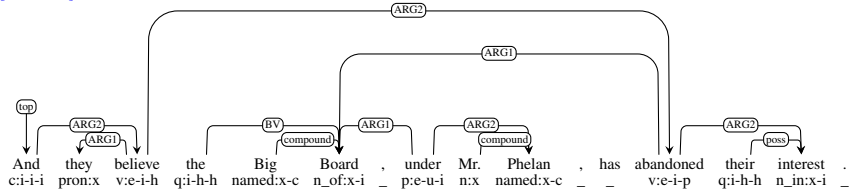
[20118071]



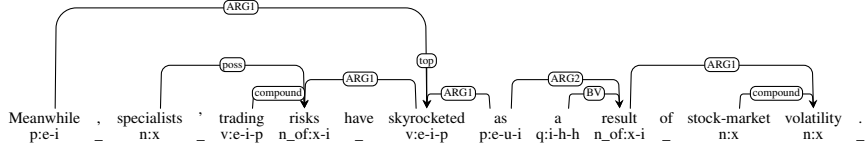
[20118072]



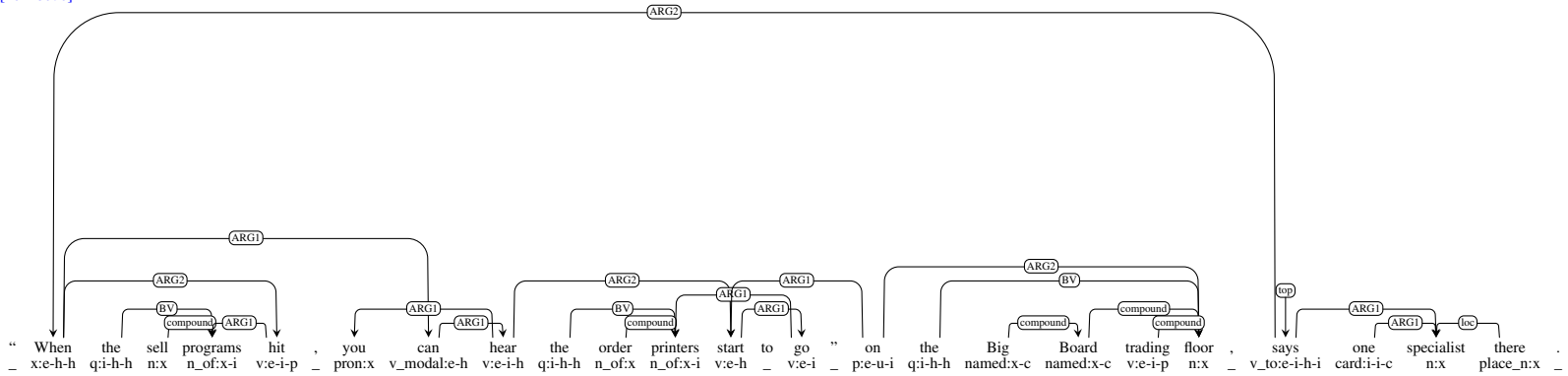
[20118073]



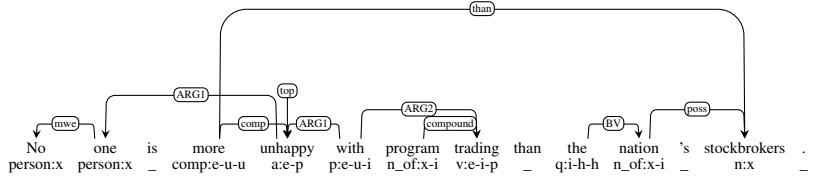
[20118075]



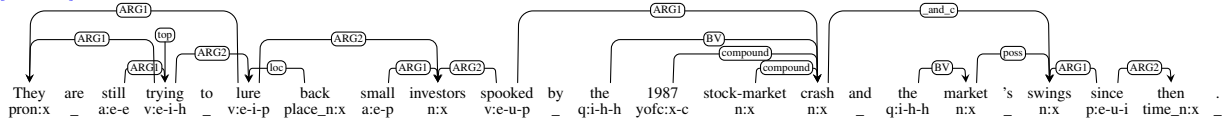
[20118076]



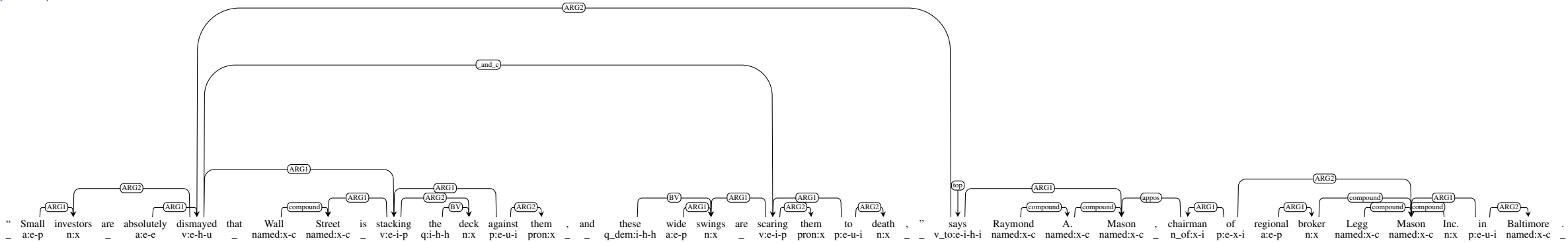
[20118078]



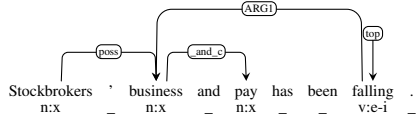
[20118079]



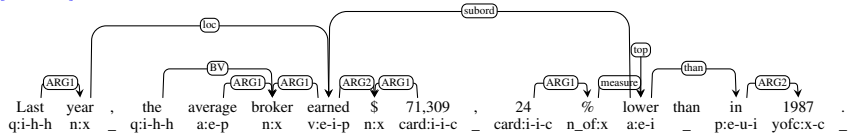
[20118080]



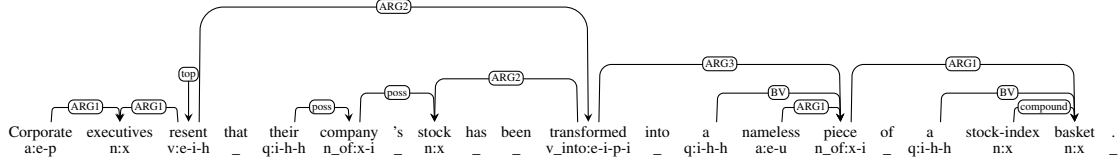
[20118081]



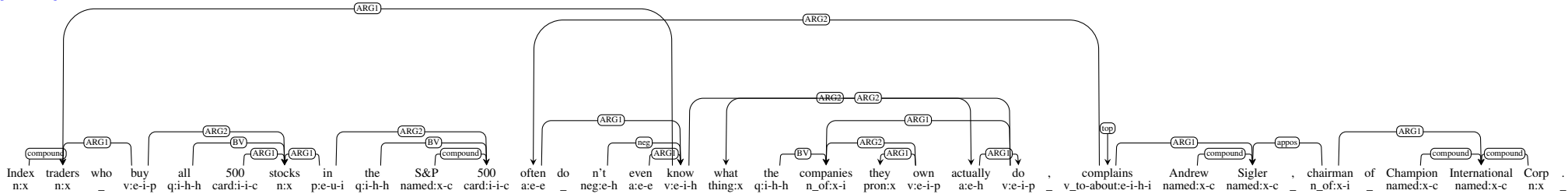
[20118082]



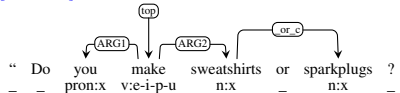
[20118083]



[20118084]



[20118085]



By this September, program traders were doing a record 13.8% of the Big Board's average daily trading volume.

Among the top practitioners were Wall Street blue bloods : Morgan Stanley & Co. , Kidder Peabody , Merrill Lynch , Salomon Brothers Inc. , and PaineWebber Group Inc .

[illegible]

Figure 10: A parse tree for the sentence in Figure 9. The tree structure is as follows:

```

graph TD
    ARG1[ARG1] --> QI[qi-h]
    ARG1 --> INDEX[indexers]
    ARG1 --> N1[n]
    ARG1 --> STR[strategy]
    ARG1 --> FOR[for]
    ARG1 --> PRE[pre-i]
    ARG1 --> QI2[qi-h]
    ARG1 --> MOM[moment]
    ARG1 --> IS[is]
    ARG1 --> TO[to]
    ARG1 --> H[hunker]
    ARG1 --> DOWN[down]
    ARG1 --> LET[let]
    ARG1 --> V1[ve-i]
    ARG1 --> QI3[qi-h]
    ARG1 --> N2[n]
    ARG1 --> V2[ve-i]
    ARG1 --> ARG2[ARG2]
    ARG1 --> ARG3[ARG3]
    ARG1 --> ARG4[ARG4]
    ARG1 --> ARG5[ARG5]
    ARG1 --> ARG6[ARG6]
    ARG1 --> ARG7[ARG7]
    ARG1 --> ARG8[ARG8]
    ARG1 --> ARG9[ARG9]
    ARG1 --> ARG10[ARG10]
    ARG1 --> ARG11[ARG11]
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    ARG1 --> ARG213[ARG212]
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    ARG1 --> ARG215[ARG214]
    ARG1 --> ARG216[ARG215]
    ARG1 --> ARG217[ARG216]
    ARG1 --> ARG218[ARG217]
    ARG1 --> ARG219[ARG218]
    ARG1 --> ARG220[ARG219]
    ARG1 --> ARG221[ARG220]
    ARG1 --> ARG222[ARG221]
    ARG1 --> ARG223[ARG222]
    ARG1 --> ARG224[ARG223]
    ARG1 --> ARG225[ARG224]
    ARG1 --> ARG226[ARG225]
    ARG1 --&
```

[illegible][illegible]

Too comp:too much money is at stake for program traders to give up .
 comp:e-u much-many_a:e-p n:x n:x p:e-u n:x x:e-h-h n_of:x n:x v_up:e-i .

Figure 1. Example of the proposed model. The model is a hierarchical structure. The root node is the sentence "For example, stock-index futures began trading in Chicago in 1982, and within two years they pronounced vix-ed-p-i the fastest-growing futures contract ever launched v_cause-x-p-p". The root node branches into two nodes: "and" and "vix-ed-p-i". The "and" node branches into "For example," and "stock-index futures began trading in Chicago in 1982, and within two years they pronounced". The "vix-ed-p-i" node branches into "the fastest-growing futures contract ever launched". The "For example," node branches into "a-e-h" and "vix-ed-p-i". The "stock-index futures began trading in Chicago in 1982, and within two years they pronounced" node branches into "stock-index futures began trading in Chicago in 1982, and within two years they pronounced" and "vix-ed-p-i". The "the fastest-growing futures contract ever launched" node branches into "the fastest-growing futures contract ever launched" and "vix-ed-p-i". The "vix-ed-p-i" node branches into "vix-ed-p-i" and "vix-ed-p-i".

Stock futures trading has minted dozens of millionaires in their 20s and 30s.

n:x n:x v:e-i-p n:x v:e-i-p x:x-i n:x p:e-u-i q:i-h-h year_range:x-c and year_range:x-c

(compound) (compound) (ARG1) (top) (ARG2) (ARG1) (ARG2) (pos) and

Now the stage is set for the battle to play out
time_n:x q-i-h n_of:x:i _ v-e-i-p x:e-h-h q-i-h-h n:x _ v-e-i-p p:e-i

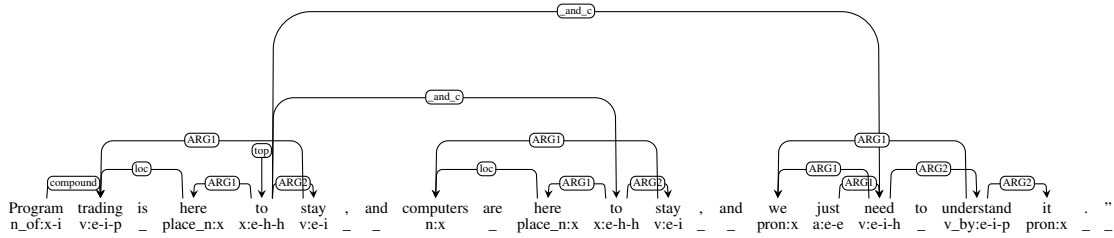
The anti-programmers are getting some helpful thunder from Congress
 q:i-h-h n_of:x-i - v:e-i-i q:i-h-h a:e-p n:x p:e-u-i named:x-c

Figure 10: A parse tree for the sentence "Program traders want to create a panic in the market so that they can't be allowed to have their way with the stock market." The tree is a hierarchical structure showing the syntactic analysis of the sentence. The root node is S, which branches into NP (Program traders) and VP (want to create a panic in the market so that they can't be allowed to have their way with the stock market). The VP branches into V (want) and VP (to create a panic in the market so that they can't be allowed to have their way with the stock market). The second VP branches into V (to) and VP (create a panic in the market so that they can't be allowed to have their way with the stock market). The third VP branches into V (create) and NP (a panic in the market so that they can't be allowed to have their way with the stock market). The NP branches into a (a) and NP (panic in the market so that they can't be allowed to have their way with the stock market). The NP branches into panic and PP (in the market so that they can't be allowed to have their way with the stock market). The PP branches into in and NP (the market so that they can't be allowed to have their way with the stock market). The NP branches into the and NP (market so that they can't be allowed to have their way with the stock market). The NP branches into market and PP (so that they can't be allowed to have their way with the stock market). The PP branches into so and NP (that they can't be allowed to have their way with the stock market). The NP branches into that and NP (they can't be allowed to have their way with the stock market). The NP branches into they and NP (can't be allowed to have their way with the stock market). The NP branches into can't and NP (be allowed to have their way with the stock market). The NP branches into be and NP (allowed to have their way with the stock market). The NP branches into allowed and NP (to have their way with the stock market). The NP branches into to and NP (have their way with the stock market). The NP branches into have and NP (their way with the stock market). The NP branches into their and NP (way with the stock market). The NP branches into way and NP (with the stock market). The NP branches into with and NP (the stock market). The NP branches into the and NP (stock market). The NP branches into stock and NP (market). The NP branches into market.

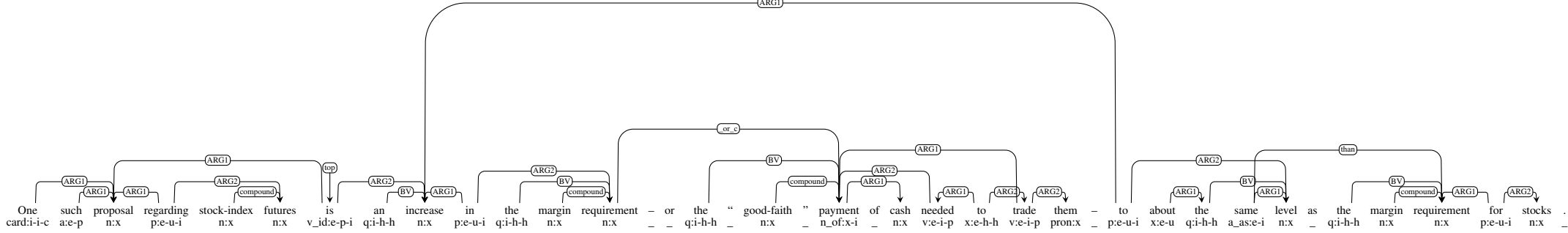
“ We have to have a system that says to those largest investors :
 _ pron:x v_qmodal:e-h _ v:e-i-i q:i-h-h a system n_o:x-i that x:x v:e-i-p p:e-u-i q_dem:i-h-h a:e-i n:x :
 ARG1 ARG1 ARG1 ARG2 ARG2 ARG1 ARG2 BV ARG1 ARG1

top
↓
' Sit down !

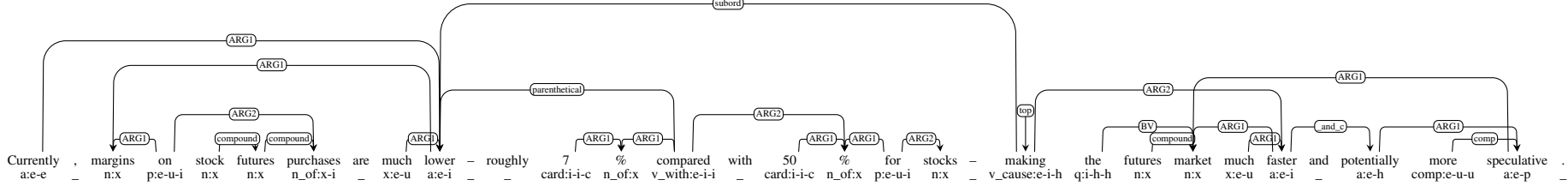
The diagram illustrates the semantic network for the sentence: "The q3-h-h named-x-c Board named-x-c 's directors meet today time_x-x-h to approve some q3-h-h program-trading restrictions n_of-x-1, but a q3-h-h total ban a-e-p is neg-e-h being considered . v_e-i-p Big named-x-c Board officials n_x v_to-e-i-h say v_to-e-i-h". The network shows the hierarchical structure of the sentence, with nodes representing words and their grammatical functions (e.g., ARG1, ARG2, COMP, SUBJ, OBJ, ADV, MOD, REL, etc.). The network is organized into a tree structure, with the root node being the sentence itself. The nodes are connected by lines, indicating the semantic relationships between the words. The network is a complex web of connections, with many nodes having multiple incoming and outgoing edges. The nodes are labeled with their grammatical functions, and the edges are labeled with the words they connect. The network is a visual representation of the semantic structure of the sentence, showing how the words are related to each other in terms of their grammatical functions and the overall meaning of the sentence.



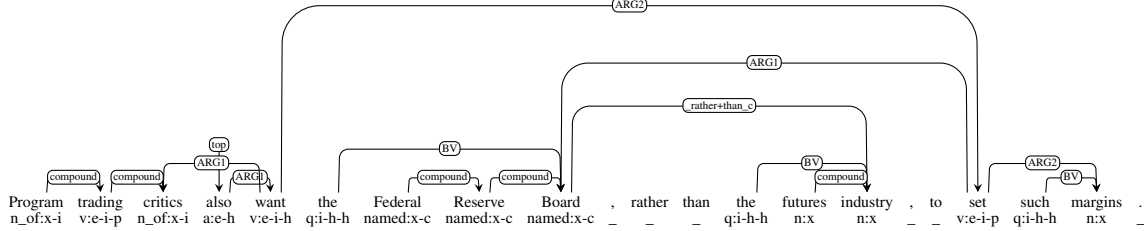
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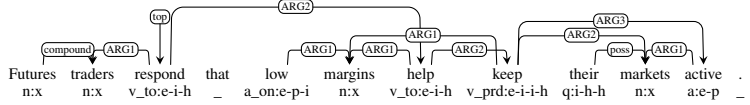
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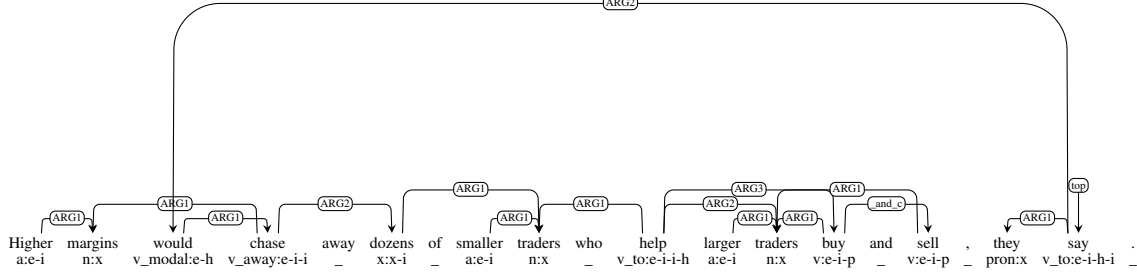
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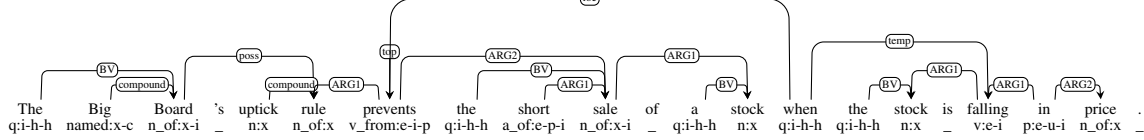
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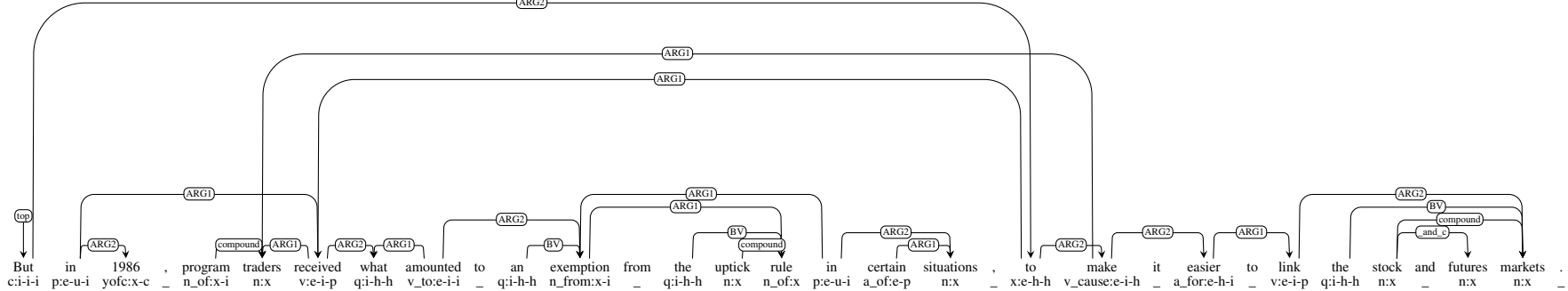
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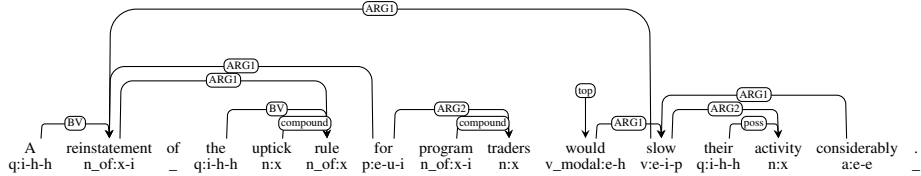
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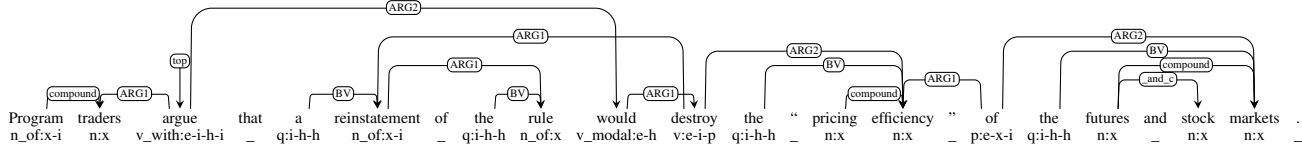
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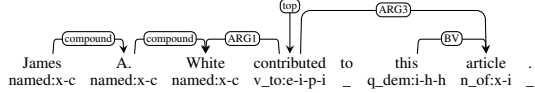
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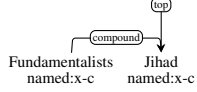
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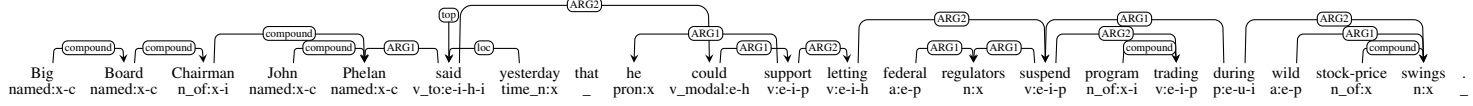
[2018120]



[2018121]



[2018122]



[2018124]

Index arbitrage is a common form of program trading .
nx nx v_ide-p-i q-i-h-h a_force-p n_of:x-i _ n_of:x-i v-e-i-p _

[20118125]

As usually practiced it takes advantage of a rather basic concept : Two separate markets in different locations , trading basically the same widgets , co n't trade them for long at prices that are widely different .
x-e-h-h ace-h v-e-i-p pron:x v_of:ie-i-p-i n_i:x _ q-i-h-h x-e-u ace-p nx _ card:i-i-c a_from:e-p-i nx p-e-u-i a_than-from:e-i nx _ v-e-i-p x-e-u q-i-h-h a_asse-i nx _ nege-h nege-h v-e-i-p pron:x p-e-u-i time_nx p-e-u-i n_of:x _ _ ace-e a_than-from:e-i _

[20118126]

In index arbitrage , the widget is the S&P 500 , and its price is constantly compared between the futures market in Chicago and the stock markets largely in New York .
p-e-u-i nx nx _ q-i-h-h nx nx v_ide-p-i q-i-h-h named:x-c card:i-i-c _ _ q-i-h-h n_of:x _ ace-e v-e-i-p p-e-u-i q-i-h-h nx nx p-e-u-i named:x-c _ q-i-h-h nx nx x-e-u p-e-u-i named:x-c named:x-c _

[20118127]

To profit from an index-arbitrage opportunity , someone who owns the S&P 500 widget in New York must sell it and replace it with a cheaper S&P 500 widget in Chicago .
x-e-h-h v_from:e-i-i _ q-i-h-h nx nx _ personx _ v-e-i-p q-i-h-h nx card:i-i-c nx p-e-u-i named:x-c named:x-c v_modul:e-h v-e-i-p pron:x _ v_with:e-i-p-i pron:x _ q-i-h-h ace-i nx card:i-i-c nx p-e-u-i named:x-c _

[20118128]

If the money manager performing this service is being paid by his clients to match or beat the return of the S&P 500 index , he is likely to remain fully invested at all times .
x-e-h-h q-i-h-h nx n_of:x-i v-e-i-p q_dem:i-h-h nx _ _ v_force-i-p-u _ q-i-h-h nx x-e-h-h v_cause:e-i-p _ v_to:e-i-p q-i-h-h n_of:x-i _ q-i-h-h named:x-c yofc:x-c nx _ pron:x _ ace-h _ v-e-i-h a_of:e-e v-e-i-p p-e-u-i q-i-h-h n_of:x _

[20118130]

By constantly seeking to own the cheapest widget , index-arbitrage traders hope to add between 1 % and 3 % to the annual return of the S&P 500 .
p-e-u-i ace-e v-e-i-h _ v-e-i-p q-i-h-h ace-i nx _ nx nx v-e-i-h _ v_to:e-i-p p-e-u-i card:i-i-c n_of:x _ card:i-i-c n_of:x p-e-u-i q-i-h-h ace-p n_of:x-i _ q-i-h-h named:x-c card:i-i-c _

[20118131]

That represents a very thin " excess " return , certainly far less than what most fundamental stock pickers claim to seek as their performance objective .
xx v-e-i-p q-i-h-h x-e-u ace-p _ nx _ n_of:x-i _ ace-h ace-p p-e-u-i p-e-u-i thing:x q-i-h-h ace-p nx nx v-e-i-h _ v-e-i-p p-e-u-i q-i-h-h nx nx _

[20118132]

The fact that a vast majority of fundamentalist money managers fail to beat the S&P 500 may contribute to the hysteria surrounding the issue .
q-i-h-h nx-h _ q-i-h-h ace-p n_of:x-i _ ace-u nx n_of:x-i v-e-h _ v_to:e-i-p q-i-h-h named:x-c card:i-i-c v_modul:e-h v_to:e-i-p-i _ q-i-h-h nx v-e-i-p q-i-h-h nx _

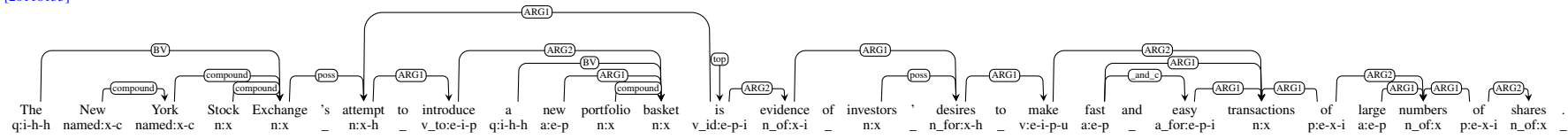
[20118133]

As more managers pursue the index-arbitrage strategy , these small opportunities between markets will be reduced and , eventually , eliminated .
x-e-h-h much-many_ace-i n_of:x-i v-e-i-p q-i-h-h nx nx n_of:x-i _ q_dem:i-h-h ace-p nx p-e-u-i nx _ _ v-e-i-p _ _ ace-e _ v_from:e-i-p _

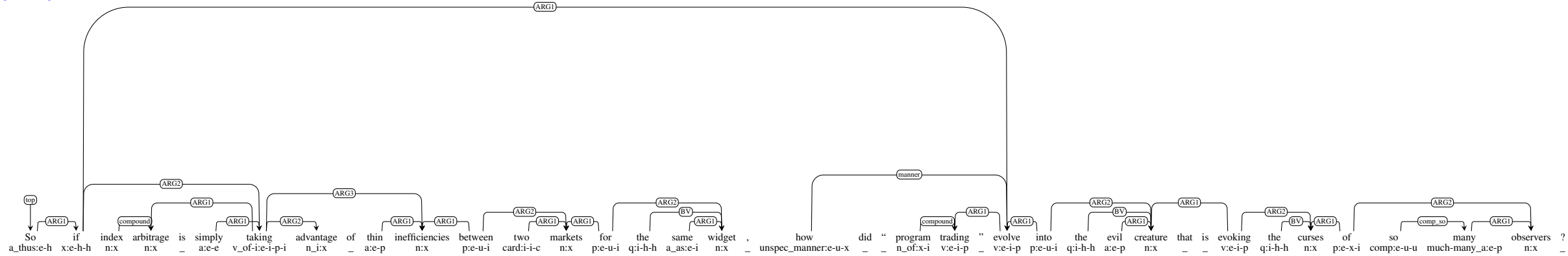
[20118134]

The current opportunities arise because the process for executing a buy or sell order in the actual stocks that make up the S&P 500 is more cumbersome than transacting in the futures market .
q-i-h-h ace-p nx v-e-i x-e-h-h p-e-u-i q-i-h-h n_of:x-i p-e-u-i v-e-i-p q-i-h-h nx nx n_of:x p-e-u-i q-i-h-h ace-p nx _ v_up:e-i-i _ q-i-h-h nx card:i-i-c _ compe-u-u ace-p _ v-e-i-p p-e-u-i q-i-h-h nx nx _

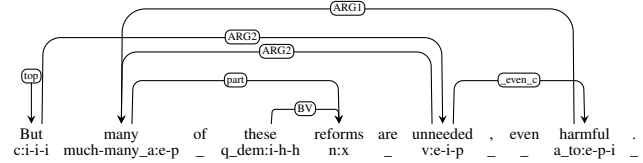
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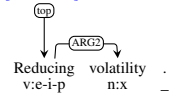
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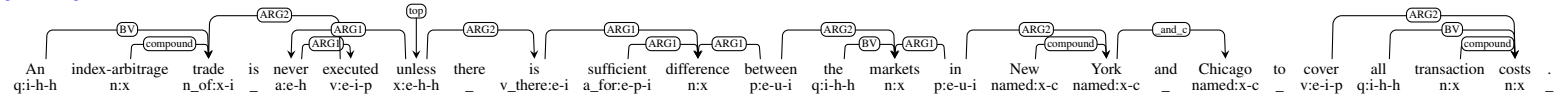
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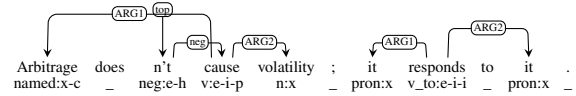
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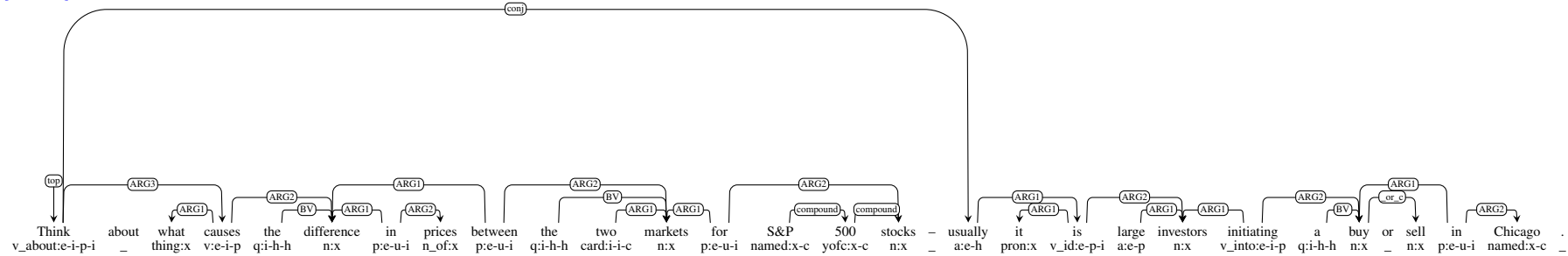
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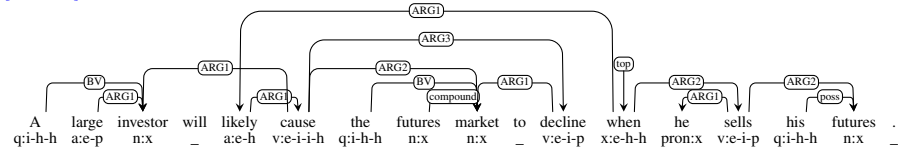
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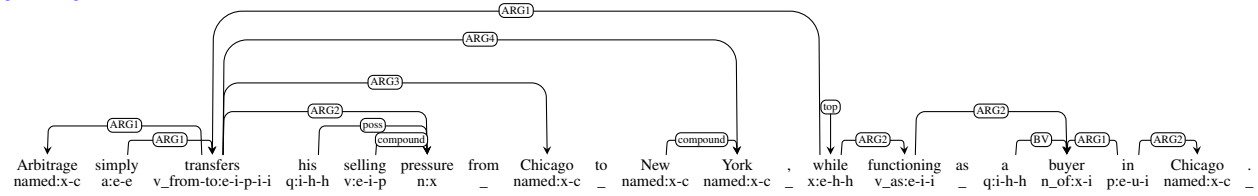
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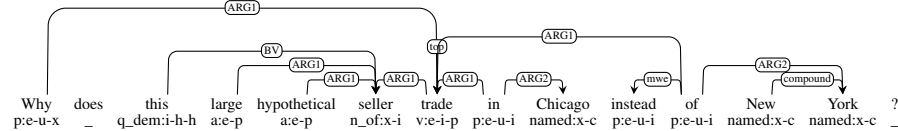
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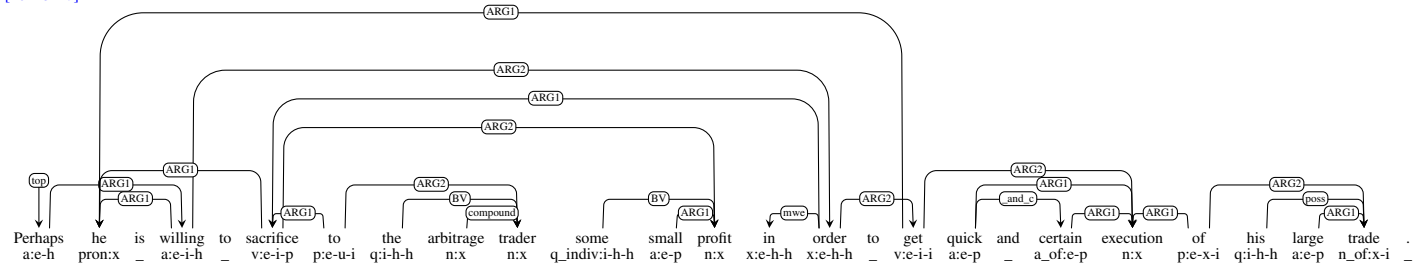
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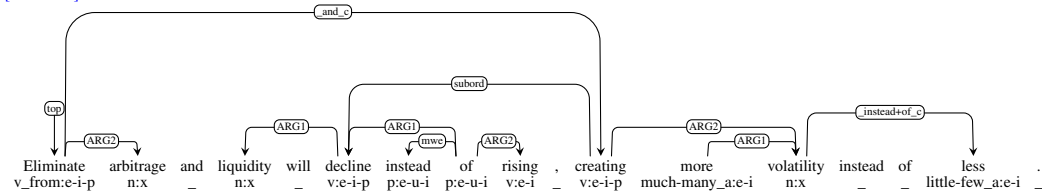
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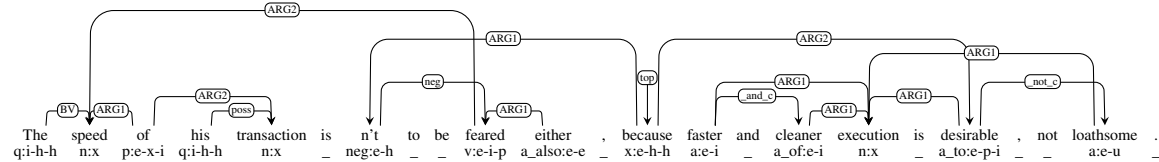
[20118147]



[20118151]



[20118152]



[20118153]

Even with mutual funds , the little investor continues to tolerate high fees , high commissions and poor performance , while index-fund managers slowly amass a better record with lower fees , lower commissions and less risk .

[20118173]

Yet our efforts are somehow less noble than those of an investment expert studiously devouring press clippings on each company he follows .

[20118174]

Almost all new regulation is introduced in the interests of protecting the little guy , and he invariably is the one least able to cope with its consequences .

[20118175]

If spreads available from index arbitrage are so enormous , surely any sizable mutual-fund company could profit from offering it to small investors .

[20118176]

The sad reality is that the retail investor continues to pursue stellar performers first , while leaving institutions to grapple with basis points of performance on large sums of money quarter by quarter .

[20118177]

Cost-effective index funds just are n't sexy enough to justify the high fees and commissions that retail customers frequently pay , and that institutional customers refuse to pay .

[20118178]

Each new trading roadblock is likely to be beaten by institutions seeking better ways to serve their high-volume clients , here or overseas .

[20118179]

Legislating new trading inefficiencies will only make things harder on the least sophisticated investors .

[20118180]

So what is next for program trading ?

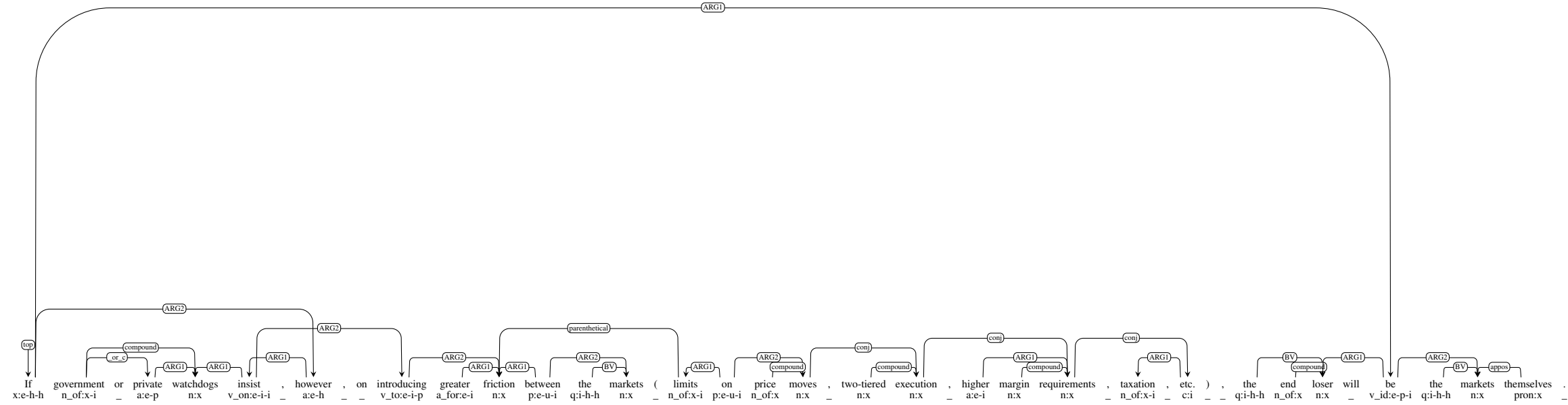
[20118181]

Left to its own devices , index arbitrage will become more and more efficient , making it harder and harder to do profitably .

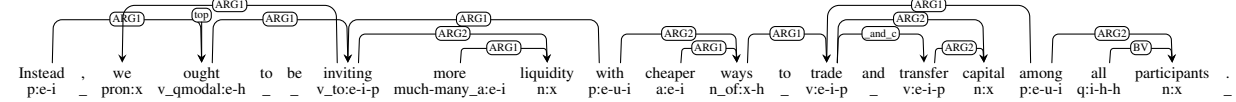
[20118182]

Spreads will become so tight that it won't matter which market an investor chooses - arbitrage will prevent him from gaining any temporary profit .

[20118183]



[20118184]



[20118185]

