



## Key Messages

- $\int_{-\infty}^{\infty} \delta(x) f(x) dx = f(0)$  (sifting property)
- $\int_{-\infty}^{\infty} \delta(x-a) f(x) dx = f(a)$  (sifting property)
- $\int_{-\infty}^{\infty} \delta(x) dx = 1$  (normalization)









... on n ... on m ... o ... n  
... n ... t































(U'VNGW, B) ... n ... A ... on ... on o ... no ... n o  
 [-Con ... n ... Bio n ...  $\epsilon^2$   $\epsilon^2$  + ... o ... o ... o  
 A ... on ... A ... o ... on n ... o ... o ... o ... o ... A ... on  
 o n n ... o ... n ... on ... n ... o ... n - ... o +, n ... o ...  
 o ... o ... o ... n ... o ... n ... n ... n ... n ... n ... n ...  
 o ... o ... n ... n - n ... +, ... n ... n ... o ... o ... n ...  
 o ... o ... o ... n ... o ... n ... o ... o ... o ...

3.3. Unobserved Components Model of Implied Volatility and Google Search Volume Residuals

A ... o ... n ... n ... n ... on - n ... o ... n ... n ... on  $\epsilon^2$   
 A ... o ... n ... o ... n ... o ... on n ... n ... o ... n ...  
 Google ... o ... on n ... n ... on ... A ... o ... o ... +,









o[. [ [ [ o[. [ on [ n o[ on. no. on n n  
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no. o [ n (n. [

References

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An ... *Journal of the American Statistical Association*

An ... *Econometrica*

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An ... *Review of Financial Studies*

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Go  $(1 + r_t)^2 = (1 + A r_t)^2 - n$  or  $n$  on  $n$  X  $(1 + r_t)^2 = (1 + A r_t)^2 - n$  *Journal of International Financial Markets, Institutions & Money*

Journal of Business & Economic Statistics

Finance Research Letters

Journal of Banking & Finance

Journal of Banking & Finance

Journal of Banking & Finance

Economic Analysis of the Digital Economy



Table  
Granger Causality Tests

	A	C n n	C n n	C n n	C n n	C n n
<i>Panel A: Without IV in VAR</i>						
$G \rightarrow$	4 - -	1 3 1	1 3 1	4 1	3 1	3 1
$\rightarrow G$	2 -	2 2	- -	3 1	1 1	1 1
$G \rightarrow$ in $o_A$	3 1	- 4	3 1	4 - -	1 1	1 1
in $o_A \rightarrow G$	1 1	3 3	- -	1 1	- -	2 - 2
$G \rightarrow$ $A n$	4 4	- -	2 - 2	- -	- 4	1 1
$A n \rightarrow G$	1 1	3 1	1 1	- -	3 3	2 - 2
<i>Panel B: With IV in VAR</i>						
$\rightarrow$	4 3 1	1 1	4 3 1	1 1	1 1	4 1 1
$\rightarrow$	2 - - 2	- - 4	4 1 1	4 1	1 1	1 1
$G \rightarrow$	4 - -	- -	4 -	- 2	3 1	1 1
$\rightarrow G$	- -	2 - 2	3 1	3 1	1 1	3 3 1
$G \rightarrow$	4 - -	1 1	- -	2 4 -	1 1	4 3 1
$\rightarrow G$	3 1 1	4 3 1	1 1	4 1	1 1	4 3 1
$G \rightarrow$ in $o_A$	1 4	1 1	4 - -	- -	1 1	3 1
in $o_A \rightarrow G$	1 1	1 1	- -	3 1	3 1	- - 2
$G \rightarrow$ $A n$	4 4	2 -	- 4	- -	- 4	1 1
$A n \rightarrow G$	- -	2 - 2 4	- -	- -	3 1	- - 2
					2	2

Abstract  
Materials for Enhanced Stability

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A ... C n n ... Co ... Ca ...



Encapsulation Methods and Enums

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A	Class	Constructor	Getter	Setter
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n A A C

Enco, pass n <sup>abe</sup>ests and M E at os w t A MA ,

A 10 C n n  
oZ 2



ar ances and ares of I, p ed a b e t  
o at ty and Goo e r ends earc o u e s du a s





Figure  
I<sub>1</sub> pulse responses