



## Miscellanea: On Heteros\*edasticity

J. Huston McCulloch

*Econometrica*, Volume 53, Issue 2 (Mar., 1985), 483.

---

Your use of the JSTOR database indicates your acceptance of JSTOR's Terms and Conditions of Use. A copy of JSTOR's Terms and Conditions of Use is available at <http://www.jstor.org/about/terms.html>, by contacting JSTOR at [jstor-info@umich.edu](mailto:jstor-info@umich.edu), or by calling JSTOR at (888)388-3574, (734)998-9101 or (FAX) (734)998-9113. No part of a JSTOR transmission may be copied, downloaded, stored, further transmitted, transferred, distributed, altered, or otherwise used, in any form or by any means, except: (1) one stored electronic and one paper copy of any article solely for your personal, non-commercial use, or (2) with prior written permission of JSTOR and the publisher of the article or other text.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

*Econometrica* is published by The Econometric Society. Please contact the publisher for further permissions regarding the use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/econosoc.html>.

---

*Econometrica*  
©1985 The Econometric Society

JSTOR and the JSTOR logo are trademarks of JSTOR, and are Registered in the U.S. Patent and Trademark Office. For more information on JSTOR contact [jstor-info@umich.edu](mailto:jstor-info@umich.edu).

©2001 JSTOR

MISCELLANEA  
ON HETEROS\*EDASTICITY

BY J. HUSTON MCCULLOCH<sup>1</sup>

THE MOST PRESSING ISSUE in econometric orthography today is whether heteros\*edasticity should be spelled with a k or with a c. Heteroskedasticity is used in their texts by Dhrymes (1970), Goldberger (1964), Intriligator (1978), Kmenta (1971) and Valavanis (1959), while heteroscedasticity is preferred by Champernowne (1969), Chow (1983), Goldfeld and Quandt (1977), Johnston (1963), Maddala (1979), Malinvaud (1970), and Theil (1971).<sup>2</sup>

Our word is a modern coinage, derived from the two Greek roots hetero-(*ἕτερο-*), meaning "other" or "different," and skedannumi (*σκεδάnnυμι*), meaning "to scatter." The letter in question is therefore the transliteration of Greek kappa (*κ*).

In scientific words which scholars have lifted directly from Greek into English, the letter kappa is always transliterated as k. Examples are skeptic (*σκεπτικός*) and skeleton (*σκελετός*).

Greek kappa does sometimes make its way into English as c, but only in common words which entered English through French and old scientific words that entered through Latin. Examples are sceptre (*σκῆπτρον*), scene (*σκηνή*) and cyclic (*κυκλικός*). Kappa becomes c in French or Latin, simply because k is not used in these languages except to spell foreign proper names. When such a c is followed by e, i, or y, however, it is always sibilant. The only way a kappa taken into French can retain its "k" sound before one of these vowels is in the rare event that it becomes "qu" (as in *squelette*).

In English as in French and Latin, c before e is always soft.<sup>3</sup> Examples include ceiling, celerey, ceremony, cease, cedar, celestial, celibacy, cell, cement, cent, center, necessary, scent, etc., any of which would sound ridiculous with a hard c.

If heteros\*edasticity were spelled with a c, it would thus have had to have entered the English language either in 1066 with the Norman invaders or else in the middle ages from Latin, neither of which was the case. Furthermore, it would have to be pronounced "heterosedasticity," which it is not.

Heteroskedasticity is therefore the proper English spelling.<sup>4</sup>

*Ohio State University*

*Manuscript received February, 1984; revision received May, 1984.*

<sup>1</sup> The author is indebted to Evangelos Falaris and Jerry Thursby for invaluable technical assistance. Any errors or omissions remain the responsibility of the author.

<sup>2</sup> The earliest use of either I could find was in a 1923 statistics text by Truman L. Kelley. Kelley (as well as Kendall and Stuart, 1958) uses "homoscedastic" and would presumably prefer "heteroscedastic." (Texts cited are not listed, at editor's request.)

<sup>3</sup> An alleged exception to this rule is Celtic, which is sometimes mispronounced "keltic" in imitation of German *Keltisch*. This word derives from Greek *Κελτοί*. Since the English spelling is ordinarily Celtic, not Keltic, it has entered through French (where *celtique* is pronounced with soft c) and not directly from Greek or even indirectly through German as occasionally happens with Greek words. Boston basketball fans therefore pronounce this word correctly, while affected academics are in error, unless they actually spell it with a k.

<sup>4</sup> *Hétéroscedasticité* is correct in French (and must be pronounced with a soft c), but has nothing to do with English, which has a k to transliterate kappa in scientific terms derived from Greek. *Cinéma* (short for *cinématographe*, from *κίνημα* + *γραφος*) was already a household word in French before it entered English and therefore retains its (soft) c.