

Miscellanea: On Heteros*edasticity

Author(s): J. Huston McCulloch

Source: *Econometrica*, Vol. 53, No. 2 (Mar., 1985), p. 483

Published by: The Econometric Society

Stable URL: <http://www.jstor.org/stable/1911250>

Accessed: 17-03-2017 22:30 UTC

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://about.jstor.org/terms>



The Econometric Society is collaborating with JSTOR to digitize, preserve and extend access to *Econometrica*

MISCELLANEA

ON HETEROS*EDASTICITY

BY J. HUSTON MCCULLOCH¹

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 (1972), Johnston (1963), Maddala (1979), Malinvaud (1970), and Theil (1971).²

Our word is a modern coinage, derived from the two Greek roots hetero-(*ἕτερο-*), meaning "other" or "different," and skedannumi (*σκεδάω*), 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 sibillant. 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.³ 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 "heterossedasticity," which it is not.

Heteroskedasticity is therefore the proper English spelling.⁴

Ohio State University

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

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

² 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.)

³ 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.

⁴ *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.