INFORMATION PRODUCTION, MARKET SIGNALLING, AND THE THEORY OF
FINANCIAL INTERMEDIATION: A COMMENT

Yuk-Shee Chan*

School of Business Administration
University of California
Berkeley, CA 94720
U.S.A.

February 1981
Revised September 1981
(to appear in the Journal of Finance)

*Doctoral candidate of finance. I thank Professors Michael Brennan, Hayne
Leland, and David Pyle for helpful comments.
INFORMATION PRODUCTION, MARKET SIGNALLING, AND THE THEORY OF FINANCIAL INTERMEDIATION: A COMMENT

In a recent article in this journal, Campbell and Kracaw (hereafter C-K) argue that initial wealth of each investor-information producer endowment acts as a constraint on reliability and as a barrier to entry to the information production industry. As a result, the information may not be produced efficiently at least cost. The purpose of this note is to show that if the information producers can borrow in the market (which is a realistic assumption) in C-K's model, then the production of information is always efficient.

Using C-K's notations, let

\[ W_i \] = wealth endowment of the most efficient information producer \( i \) (his information cost is \( C_i \))

\[ C_j \] = second lowest cost of information production for producer \( j \)

\[ \bar{V} \] = average value of all firms in the market

\[ V_A \] = intrinsic value of type A firms (\( V_A > \bar{V} \))

\[ N_A \] = number of type A firms in the market

\[ S_A \] = side payment to producer \( i \) for information production (in C-K's model, \( S_A = C_j \) with competitive bidding for the contract to produce information)

C-K consider the case in which producer \( i \) forms an intermediary to collect sufficient funds from other investors to purchase all \( N_A \) undervalued firms at a price \( N_A V_A - S_A \). The producer invests his own wealth \( W_i \) and raises funds of the amount \( N_A V_A - W_i - S_A \) from outside sources (the suppliers of funds are owners of the intermediary).
INFORMATION PRODUCTION, MARKET SIGNALLING, AND THE THEORY OF FINANCIAL INTERMEDIATION: A COMMENT

In a recent article in this journal, Campbell and Kracaw (hereafter C-K) argue that initial wealth of each investor-information producer endowment acts as a constraint on reliability and as a barrier to entry to the information production industry. As a result, the information may not be produced efficiently at least cost. The purpose of this note is to show that if the information producers can borrow in the market (which is a realistic assumption) in C-K's model, then the production of information is always efficient.

Using C-K's notations, let

\[ W_i = \text{wealth endowment of the most efficient information producer } i \] (his information cost is \( C_i \))

\[ C_j = \text{second lowest cost of information production for producer } j \]

\[ \bar{V} = \text{average value of all firms in the market} \]

\[ V_A = \text{intrinsic value of type A firms} \ (V_A > \bar{V}) \]

\[ N_A = \text{number of type A firms in the market} \]

\[ S_A = \text{side payment to producer } i \text{ for information production (in C-K's model, } S_A = C_j \text{ with competitive bidding for the contract to produce information)} \]

C-K consider the case in which producer \( i \) forms an intermediary to collect sufficient funds from other investors to purchase all \( N_A \) undervalued firms at a price \( N_A V_A - S_A \). The producer invests his own wealth \( W_i \) and raises funds of the amount \( N_A V_A - W_i - S_A \) from outside sources (the suppliers of funds are owners of the intermediary).
C-K conclude that the reliability of any intermediary (a firm that incurs the information cost and identifies the true undervalued type A firms) is established only when $W_i$ is large enough such that,

$$
\frac{V_A - \overline{V}}{V_A} > S_A \frac{\overline{V}}{V_A}.
$$

(1)

As a result, C-K argue that the most efficient information producer $i$ may be precluded from the information production industry by the market-imposed wealth constraint (1) if $W_i$ is not large enough.

We now assume there are borrowing opportunities for the information producers in the market. Since C-K consider a timeless model, investors are willing to lend to producer $i$ so long as their capital plus an arbitrarily small interest payment is protected even if he acts dishonestly, i.e., does not incur the information cost and identifies "type A" firms randomly. Investors are willing to lend an amount $B$ to information producer $i$ if

$$
(W_i + S_A + B) \frac{\overline{V}}{V_A} > B
$$

(2)

so that $B^*$, the maximum amount investors are willing to lend, is:

$$
B^* = \frac{(W_i + S_A)\overline{V}}{V_A - \overline{V}}.
$$

(3)

Assume producer $i$ borrows $B$ from the market, the reliability of the intermediary is established if $B$ is large enough that,
\[(W_i + B) \frac{V_A - \bar{V}}{V_A} > S_A \frac{V}{V_A} \]  

(4)

To see whether reliability can always be established by the most efficient information producer with borrowing opportunities, we insert \(B^*\) for \(B\) in (4). Simplifying, we get

\[W_i V_A > 0.\]  

(5)

By assumption of positivity of wealth and market value of firms (5) always holds, which implies information production is efficient in C-K's model with borrowing.

The above analysis pinpoints the importance of borrowing opportunities in a financial market with costly information in order to have efficient production of information. In reality, financial intermediaries, such as commercial banks and savings and loans associations, do borrow from the market by offering depository services. In fact, we may argue that if the most efficient information producer can only assure reliability through enough stake in the investments (a signal of reliability) he identifies as undervalued, borrowing opportunities can solve C-K's wealth constraint problem. As indicated above, both the information producer and the lenders are better off as they share the savings from reduced information cost, \(C_j - C_i\).

The moral hazard problem of information production in a financial market has also been considered by Leland-Pyle (1977) with a signalling equilibrium framework with borrowing. In both C-K's and Leland-Pyle's models, the signal of superiority of investment prospects is
conveyed from those who have the information (in C-K's model they are the information producers, in Leland-Pyle's model they are the entrepreneurs) to those who do not have the information by investing the former's usable resources (which may include borrowed funds) in those investment prospects. In essence, the signals in both papers are similar.