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# Contract settlement specification and price discovery: Empirical evidence in Australia individual share futures market

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## Abstract

This study applies Geweke [J. Am. Stat. Assoc. 76 (1982) 304] measures of information flow and dependence between Australian individual share futures (ISF) contract and its underlying stock market to investigate whether the price discovery function of futures price has been enhanced after the switch of futures contracts from cash settlement to physical delivery. It is found that the spot market leads the futures market as the futures trading volume is rather small. Further tests suggest that the switch from cash settlement to physical delivery in the ISF contracts has reinforced the information flow from the spot market to the futures market.

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## 1. Introduction

Futures contracts are mostly settled by delivery of the underlying asset because the delivery promotes the convergence of cash and futures prices and thus improves hedging performance and informativeness of futures price (Garbade & Silber, 1981). Some,

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however, are settled in cash due to impractical delivery of the underlying asset such as stock indices. In addition, high delivery cost and vulnerability to market manipulation associated with a physical delivery contract, which may induce price distortions at the expiration, have also advocated an adoption of cash settlement (Edwards & Ma, 1996; Manaster, 1992). The challenge with cash settlement is to make sure that the settlement price properly reflects underlying asset value at the expiration. If this does not occur, the hedging and price discovery functions of futures market are impaired. Cornell (1997) summarizes three types of problems that can cause cash settling futures prices to diverge from true equilibrium prices. Thus, the choice between cash settlement and physical delivery mainly depends on probability of convergence between spot and futures prices at the expiration. This leads some futures contracts, such as feeder cattle and lean hog futures contracts traded in Chicago Mercantile Exchange (CME), to switch from physical delivery to cash settlement and others, such as individual share futures (ISF) in Sydney Futures Exchange (SFE), from cash settlement to physical delivery.

Consequently, several studies have examined whether hedging performance in the futures market has been improved or whether informativeness of futures price has been increased after a futures contract is switched from one settlement mechanism to the other. For instance, Lien and Tse (2002) and Rich and Leuthold (1993) examine the effects of cash settlement on the feeder cattle market performance. Both studies provide similar results, which are consistent with the presumptions of CME when initiating the change. Cash settlement reduces the basis variability and enhances the hedging effectiveness. Chan and Lien (2002) study the impact of change in settlement specification on the price discovery function of futures market for both feeder cattle and live/lean hog futures contracts. They find that the feeder cattle futures contract improves its price discovery function after the cash settlement is adopted. But the results for lean hog futures market are not clear cut, probably due to short time span after the contract switches to cash settlement.

Little study has been conducted concerning the effect of change in settlement specification on the hedging performance and informativeness of price in Australian ISF market. Australian ISF contracts were settled in cash when they were first traded in 1994. After 2 years, SFE decided to switch from cash settlement to physical delivery. Share futures are different from commodity futures. Commodities are by nature heterogeneous and perishable. The delivery process therefore incurs large transaction costs, including transportation, inspection, storage, and insurance. In addition, physical delivery settlement must specify deliverable grades with premium/discounts and deliverable locations. Therefore, a cash settlement specification for a commodity futures contract is desirable provided an appropriate cash index for settling a contract can be constructed.

Instead, a share futures contract has the homogeneous underlying asset. There is no grade heterogeneity problem and delivery cost is small. Physical delivery specification is deemed appropriate and it has advantage of improvement in hedging function. For example, consider an equity call writer who buys the ISF to reduce risk exposure. The physical delivery specification allows them to obtain the stock at the maturity date, whereas cash settlement concludes with cash transferring. Additional risk is incurred when the call writer enters the stock market to purchase the needed stock. On the other hand, physical delivery

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