Replication of a real-estate market index

submitted by the National Bank of Canada

Canadian investors may choose to invest their funds into several index-linked investment products, whose goal is to offer the return or inverse return of a market index (i.e., S&P/TSX 60, S&P 500, Barclays Aggregate Bond Index). In most cases shares and bonds are the types of assets underlying these indices. The National Bank of Canada wishes to offer its clients investment products that would allow them a (long or short) exposure to a Canadian real-estate index. Contrary to what is the case for indices based on traditional asset types, the Bank cannot buy a pool of assets underlying the real-estate indices (something that would shield it from risk). It would be very expensive for the Bank to build such a pool and any change to the pool would involve a lot of work, because real estate consists of illiquid assets.

The goal of the Bank is thus to develop a replication strategy, i.e., a strategy for simulating the return of real-estate indices through the use of liquid financial tools such as futures contracts. The Bank does not insist on the use of futures contracts to solve the problem posed; futures contracts, however, are for the most part liquid assets for which one may easily take a low-cost “buyer” or “seller” exposure (commission, bid-ask spread, market impact). Therefore one will have to determine which group of liquid assets enables one to replicate the returns of a real-estate index. One will then look for the best model allowing the replication of these returns. Note that the Canadian real-estate indices we wish to replicate are computed on a monthly basis and published 10 working days after the end of each month. The index values are not available on a daily basis; thus one has the extra challenge of forecasting and estimating the true index values at any given time.