Supplemental to "Profiting from the past: Are fossils a sound investment?

by Scott Hippensteel and Simon Condliffe

Supplementary Material 1: Methodology

The mean selling price of four fossils was followed in this twenty-year study: a ~6-inch Eocene fish fossil, a Moroccan trilobite, and a ~4- and ~6-inch fossil shark tooth. Each fossil was selected for study because it met the following criteria: 1) the fossil was commercially abundant during each ten-year time period and the fossils were numerous enough to permit comparison with fossils of similar size and condition. Furthermore, with a sufficient number of fossils, the influence of taphonomy on the value could be nearly eliminated; 2) the fossils were, and continue to be, in demand by collectors but not necessarily by universities and museums. Research-quality fossils tend to be rare enough that determining a value is difficult and tracking the value of such fossils over a 20 year time-interval is impossible. In summary, the fossils followed in this study were common enough to prove a statistically significant data set (>200 values/year), yet rare enough to be considered investment-worthy by collectors and dealers.

Many varieties of Eocene fossil fish are available from the Green River Formation of the western United States, and several taxa were considered as potential investment fossils. *Knightlia,* a minnow, is so common it is rarely collected as a potential investment and sells for only a few dollars. Others taxa, including gars and freshwater skates, are so rare that comparison of values over time is impossible. The fossil selected for study from this formation is *Dyplomystus,* a herring. This fish is common enough to allow for a comparison between several hundred selling prices yet rare enough that it has a higher financial value. It is also not commonly sought after as a museum or university-quality research specimen. As a result, *Dyplomystus* is commonly found on commercial fossil sites that claim to sell "investment-grade" fossils[1,2].

This variety of fossils, including fossils from different localities and ages, was selected to provide a reasonable cross-section of values across the commercial spectrum. Most fossil prices were collected from dealers located in the United States and United Kingdom and prices were converted to United States dollars at the conversion rate at the time the data were collected. Several commercial dealers advertise these particular fossils as being ideal for display and investment, making the cross-section of fossils a representative portfolio.

Supplementary Material 2: Fossil Criteria

The 1012 fossils used in this study came from specimens that were comparable in size and condition. A description of each fossil group and a more comprehensive explanation of why it was selected for study are explained below.

***Diplomystus* sp.**

The *Diplomystus* sp. fish fossil was selected for study because it is commercially available and commonly used as a display fossil by interior decorators. This fish fossil is also commonly purported to be a superlative investment fossil[3,4]. All fossils in this study were from the Eocene Green River Formation in Lincoln County, Wyoming. Although this fossil and the surrounding matrix are commonly framed for display, only unframed specimens were recorded in this study. Selling price typically correlates directly with fossil length so only complete specimens between 5.5- and 6.5 inches in length were recorded. Further, only unrestored complete fish fossils were recorded.

Phacops spp.

This large Moroccan trilobite was also identified by sellers as *Phacops rana africanus, Drotops megalomanicus,* and *Phacops megalomanicus.* Our data set included only trilobites on matrix with full articulation, visible eyes, and minimal enrollment. All specimens were between 4.5 and 6-inches in length and were in good condition with minimal restoration. This fossil is primarily recovered from the Atlas Mountains region of North Africa and has been imported into the United States since the late 1980's. Today, more than 50,000 Moroccans are employed in the fossil discovery, recovery, and sales market[5]. Unfortunately, trilobites are one of the most common fossils to be counterfeited or significantly repaired[6].

***Carcharodon (Charcharocles) megalodon* teeth**

C. megalodon teeth formed two sub-groups in this study: those varying in size between 3.5 and 4.5-inches in length and those between 5.5 and 6.5-inches in length. *C. megalodon* is the most common marine vertebrate fossil at trade shows and available from online dealers. It is especially common on "fossil investment" sites[7]. The *New York Times* (September 15, 1996) cited *C. megalodon* as an example of a fossil that outperformed equivalent investments in the stock market for the period 1970 – 1995[8]. Commercial dealers commonly grade the fossils according to size, tip damage, enamel condition, root loss or cracks and source (location). To

minimize the influence of taphonomic degradation on fossil prices, only teeth with excellent root and enamel condition with well-defined serrations and no tip damage were included in the data set.

Supplementary Materials References

1 www.paleodirect.com/pgset2/f088.htm; accessed February 23, 2012

2 www.twoguysfossils.com/wyoming_fish_fossils.htm; accessed February 20, 2012

3 www.twoguysfossils.com/index.htm; accessed February 20, 2012

4 www.paleodirect.com/meg1.htm; accessed February 23, 2012

5 Sicree, Andrew A., 2009, Morocco's Trilobite Economy, Saudi Aramco World, v. 60, n. 2, p. 34-39.

6 The Fossil Frenzy, Osborne, Lawrence, The Fossil Frenzy, The New York Times, October 29, 2000

7 www.megalodonsharkteeth.com/index.php; accessed March 15, 2012

8 McClain, Dylan L. Natural History at Unnatural Prices, *The New York Times*, September 15, 1996