

## Case Study: Marsoft's Valuation Methodology

The objective of this document is to summarize lessons learned as part of an exercise undertaken for one of our clients to validate the accuracy of our vessel values. The client expressed a strong desire to have Marsoft's valuations recognized as a baseline for internal use, and used by rating agencies to meet the reporting requirements for an asset-backed securitization.

The client asked us to describe Marsoft's valuation methodology and demonstrate that it is consistent with the guidelines for desktop valuations provided by brokers as used in three previous securitizations done in shipping. These guidelines are as follows:

- (1) Valuations are external and not corrupted, i.e. are based on an objective and documented process, starting with quarterly reported transactions.
- (2) Valuations are based primarily on "last done", i.e. the nearest comparable sale(s) reported in the most recent quarter.
- (3) Valuations are on an "as is where is" at "Arm's Length" and "Charter Free" between a "Willing Buyer and Willing Seller" (no distressed sales).

The exercise consisted of the following components:

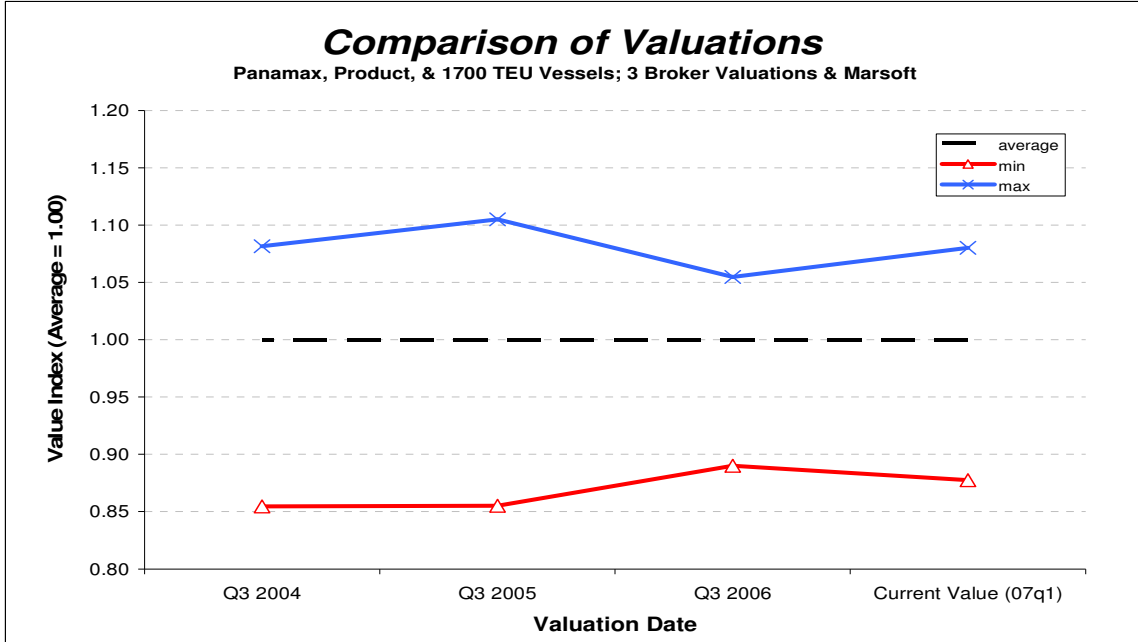
- (1) Comparison of Marsoft vs. broker valuations for three representative vessels;
- (2) A memo summarizing the steps we take to estimate a vessel's current market value based on reported broker transactions, illustrated with a specific case.

Each of these components, and the conclusion of this exercise, is described in more detail below.

### **Comparison of Marsoft vs. Broker Valuations**

Marsoft performed a "bandwidth analysis" comparing Marsoft valuations against valuations provided by three well-known London-based brokers: Clarksons, Simpson Spence & Young, and Arrow Shipbrokers.

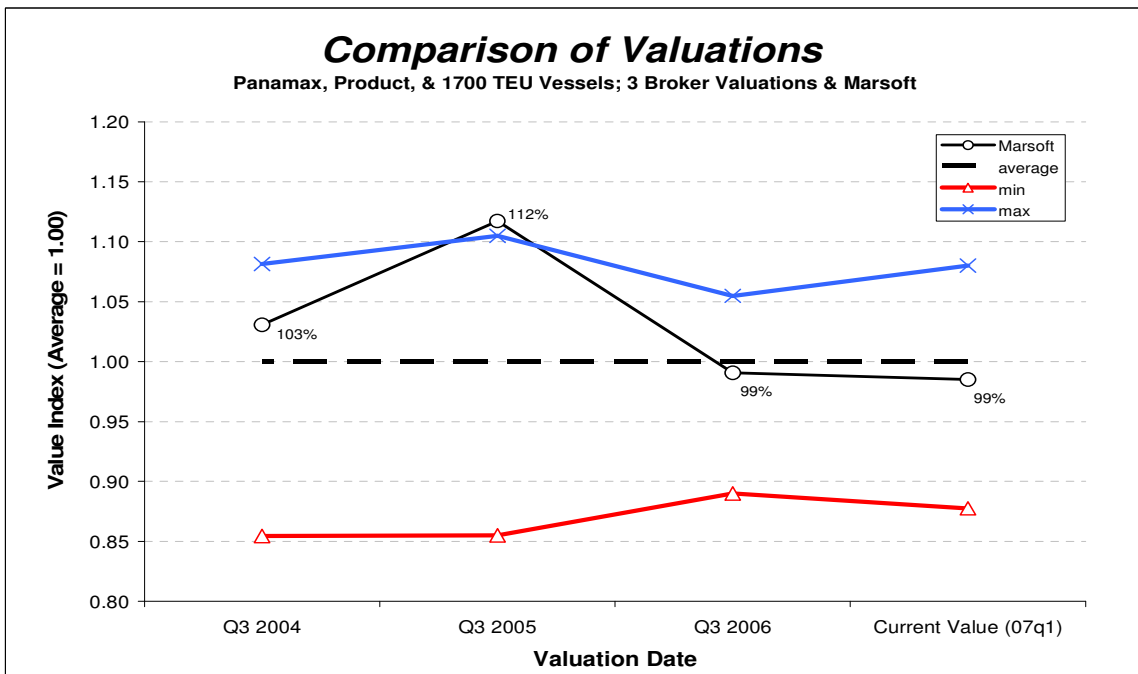
We looked at valuations over the period 2004-2007 for a 2001-built, 74,000 dwt gearless Panamax bulker; a 1996-built 28,280 dwt double hull product tanker; and a 2002-built, 1728 TEU gearless fully cellular containership. The chart below shows the results of our analysis. Valuations are converted to an index basis to simplify the presentation, so everything should center around 1.00.



We compared broker average valuation for the 3 vessels (depicted by the dashed line) with the variation in broker valuations, expressed by the maximum and minimum valuations in each period.

Although each broker suggests there is a +/- 5% range around the values they report, the valuation analysis done for the three vessels shows that across three brokers, individual valuations for the same vessel vary by 5-15% from the average valuation in each period.

Next we compared Marsoft's average valuations (depicted by the solid line in the chart below) with the broker average valuation. On average we deviate by about 3-4% from the broker average valuation. The largest deviation was 12% in 2005, which was characterized by a period of rapidly changing prices.



## **Conclusion**

The exercise confirmed the consistency of our valuations relative to those of brokers, allowing our client to use Marsoft valuations – at no marginal cost – to meet their reporting requirements for the securitization.

The direct cost savings of using Marsoft's valuations for a securitization, or a similar scenario, is substantial. A securitization portfolio of 100 vessels, each requiring semi-annual valuations from three different brokers, would need 600 valuations per year. The precise cost of the 9 valuations (3 vessels times 3 brokers) in this exercise came to \$10,000, or about \$1000/vessel. This implies a cost of as much as \$600,000 for semi-annual valuations for the portfolio, excluding the cost to manage the process of ordering, collecting, and analyzing valuations from multiple sources.

The cost savings obviously depends on the scale and frequency with which valuations are needed, as well as any volume-based discounts.

In addition to cost savings, Marsoft's TSCM allows our client to rely on valuations using a single point of departure, produced by a documented methodology, rather than multiple broker valuations requiring further reconciliation. Furthermore, the rating agencies expressed a comfort in having the ability to look at the historical volatility of valuations when using our figures.

### **Estimating the current market value of a vessel based on reported broker transactions**

To demonstrate the Marsoft approach for estimating the current market value of a vessel, we selected a vessel from the securitization portfolio, and prepared a case study to show the steps we take to translate through how we estimate the current market value of a panamax bulker based on reported broker transactions. For this case, we looked at the Selendang Tiara, an 8.5 year-old, 72,928dwt, geared Panamax bulker and our price estimates for the fourth quarter of 2006.

The Selendang Tiara was chosen as it is a fairly challenging example, since there are relatively few geared panamax bulkers (most handymax and supramax vessels are geared), and there were no reported sales of a Panamax of this age. The inherent difficulty in routinely finding precise reference points for a valuation underscores the need for adjustment factors to account for a vessel's size, age, gearing and/or hull type.

The process of estimating vessel values involves collecting data on reported transactions in the quarter, reviewing broker estimates, and applying our expert judgment to estimate prices for benchmark vessels.<sup>1</sup> This is done quarterly as part of Marsoft's routine processes. Although we rely primarily on observed transactions of similar vessels, Marsoft may use additional information as appropriate. Specifically, we review published brokerage sources, valuation estimates from our clients, and developments in related markets. This broad approach is particularly important when there are relatively few transactions reported or the transactions do not meet all the requirements of point (3) in the valuation guidelines.

### **Step 1. Collecting reported transactions in a quarter**

In the fourth quarter of 2006, we saw 40 transactions for Panamax vessels. These transactions are shown in the table below. Transactions which were not representative of or compatible with our

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<sup>1</sup> Please see Marsoft's TSCM Documentation for the PEM module (April 2006) for a complete description of the methodology.

benchmark ship were eliminated, including vessels sold “en-bloc”, those with charters attached, or ships over 20-years old.

Of the 40 reported transactions, 26 were eliminated, and the remaining 14 were used to derive the benchmark 5-year and 10-year old vessel prices. All transactions are shown below.

M	ShipName	DWT	Bit	Age	Price	Comments
Oct	Alexandroupolis	77,299	1982	24	8.75	Excluded: Over 20yrs old
Oct	Edco Star	64,059	1982	24	6.36	Excluded: Over 20yrs old
Oct	APJ JIT	77,300	1983	23	8.75	Excluded: Over 20yrs old
Oct	Cape Courage	63,770	1982	24	11	Excluded: Over 20yrs old
Oct	Natalie	64,911	1981	25	10.2	Excluded: Over 20yrs old
Oct	Lemnos	86,722	1982	24	11.25	Excluded: Over 20yrs old
Oct	Panli	70,838	1982	24	12.5	Excluded: Over 20yrs old
Oct	Flecha	65,081	1982	24	11.25	Excluded: Over 20yrs old
Nov	Stefania	61,636	1981	25	10.3	Excluded: Over 20yrs old
Nov	Feride	77,016	1982	24	12.5	Excluded: Over 20yrs old
Nov	Navarino	63,879	1983	23	11.5	Excluded: Over 20yrs old
Nov	Alba	64,711	1983	23	11	Excluded: Over 20yrs old
Dec	Invader I	64,471	1982	24	11	Excluded: Over 20yrs old
Dec	Four Euro	61,455	1984	22	14.1	Excluded: Over 20yrs old
Dec	Strigglä	64,747	1982	24	12	Excluded: Over 20yrs old
Nov	Alterego	74,047	1999	7	41.8	Excluded: Sold en bloc
Nov	Miltiadis II	72,493	1999	7	41.2	Excluded: Sold en bloc
Nov	Doric Challenge	82,800	2006	0	59.75	Excluded: Sold en bloc
Nov	Doric Freedom	82,800	2006	0	59.75	Excluded: Sold en bloc
Dec	Ourania Hope	68,676	2005	1	25.5	Excluded: TC until may 07 @26,500
Oct	Maria G.O.	74,364	2005	1	50	Use for benchmark analysis
Oct	Esperis P	70,182	1994	12	32	Use for benchmark analysis
Nov	Ariadne	73,018	1999	7	40.5	Use for benchmark analysis
Nov	Red Tulip	76,629	2003	3	48	Use for benchmark analysis
Nov	Restless	72,200	2000	6	42	Use for benchmark analysis
Nov	Apj Suryavir	71,037	1990	16	26	Use for benchmark analysis
Nov	Zella Oldendorff	73,931	2001	5	41	Use for benchmark analysis
Nov	Avalon	73,080	1996	10	36	Use for benchmark analysis
Nov	Leda	75,121	2001	5	44	Use for benchmark analysis
Nov	Leto	75,151	2001	5	44	Use for benchmark analysis
Nov	Ionian Father	71,535	1994	12	33.5	Use for benchmark analysis
Dec	Timeless	76,529	2002	4	47.9	Use for benchmark analysis
Dec	Danae	75,106	2003	3	44	Use for benchmark analysis
Dec	Maritime King	73,350	1994	12	35	Use for benchmark analysis
Dec	Atlantica	73,538	1995	11	37	Use for benchmark analysis

## **Step 2. Translating actual transactions into benchmark prices**

We use vessels between 0 and 9 years old to formulate our 5-year prices, those between 5 and 15 years of age for our 10-year prices, and all ships between 10 and 20 years old for our 15-year prices. So, for example, a 7 year-old vessel may be used in the analysis of both the 5 and 10-year secondhand prices by using the TSCM to apply a premium for the 5 year-old ship and a discount for the 10 year-old vessel. The table below shows the transactions used to calculate the 2006q4 benchmark prices for the Panamax. We list each vessel along with its relevant specifications (size, age, hull type) and the actual price that the vessel was sold for.

Month	ShipName	DWT	Blt	Age	Actual Price \$m	TSCM Estimated Price	Hull Type	Marsoft Benchmark Size	5-yr Benchmark Price	5-yr Adjusted Price	Monthly Avg 5-yr Adj. Price	10-yr Benchmark Price	10-yr Adjusted Price	Monthly Avg 10-yr Adj. Price
Oct '06	Maria G.O.	74364 dw t	2005	1	50	47	SH	74,000	\$41.70	\$44.70	\$44.70	-	-	\$38.00
Oct '06	Esperis P	70182 dw t	1994	12	32	26.8	SH	74,000	-	-	-	\$32.80	\$38.00	-
Nov '06	Red Tulip	76629 dw t	2003	3	48	44	SH	74,000	\$41.70	\$45.70	\$45.25	-	-	\$36.90
Nov '06	Zella Oldendorff	73931 dw t	2001	5	41	40	SH	74,000	\$41.70	\$42.70	-	\$32.80	\$33.80	-
Nov '06	Leda	75121 dw t	2001	5	44	40.2	SH	74,000	\$41.70	\$45.50	-	\$32.80	\$36.60	-
Nov '06	Leto	75151 dw t	2001	5	44	40.2	SH	74,000	\$41.70	\$45.50	-	\$32.80	\$36.60	-
Nov '06	Restless	72200 dw t	2000	6	42	37.6	SH	74,000	\$41.70	\$46.10	-	\$32.80	\$37.20	-
Nov '06	Ariadne	73018 dw t	1999	7	40.5	36.2	SH	74,000	\$41.70	\$46.00	-	\$32.80	\$37.10	-
Nov '06	Avalon	73080 dw t	1996	10	36	31	SH	74,000	-	-	-	\$32.80	\$37.80	-
Nov '06	Ionian Father	71535 dw t	1994	12	33.5	27.1	SH	74,000	-	-	-	\$32.80	\$39.20	-
Nov '06	Apj Suryavir	71037 dw t	1990	16	26	20	SH	74,000	-	-	-	-	-	-
Dec '06	Danae	75106 dw t	2003	3	44	43.7	SH	74,000	\$41.70	\$42.00	\$44.65	-	-	\$40.30
Dec '06	Timeless	76529 dw t	2002	4	47.9	42.3	SH	74,000	\$41.70	\$47.30	-	-	-	-
Dec '06	Atlantica	73538 dw t	1995	11	37	29.4	SH	74,000	-	-	-	\$32.80	\$40.40	-
Dec '06	Maritime King	73350 dw t	1994	12	35	27.6	SH	74,000	-	-	-	\$32.80	\$40.20	-
Average:											\$44.87			\$38.40
Actual Benchmark Prices:											\$44.00			\$36.00

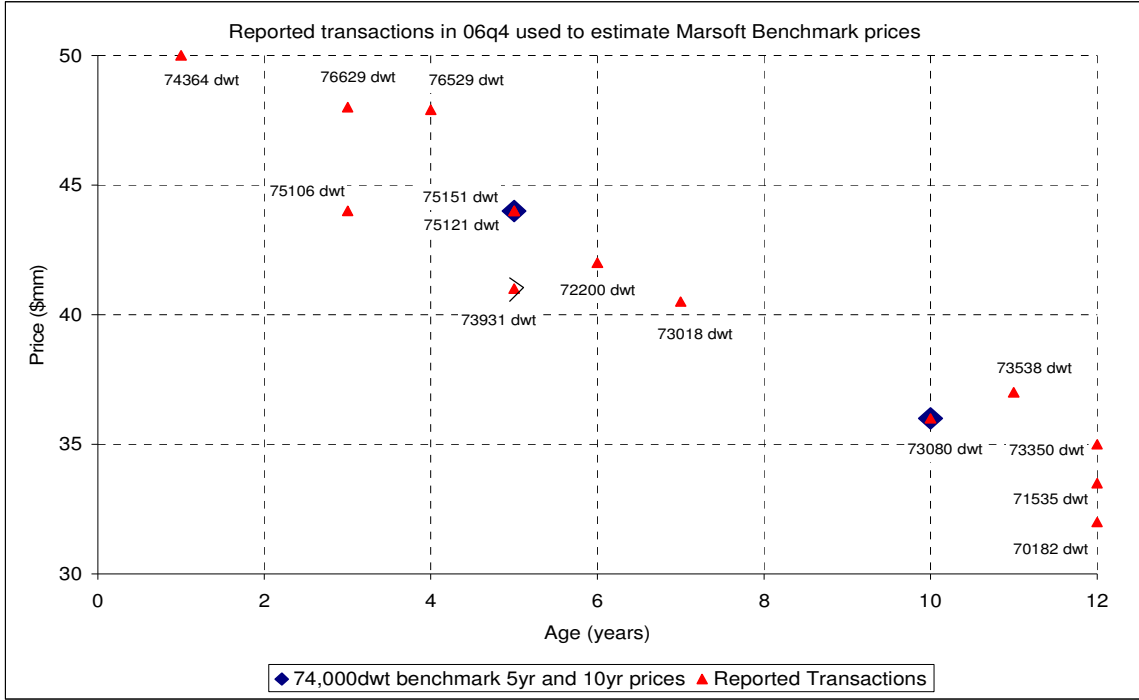
To estimate 5-year old prices we look at all vessels between the ages of 1 and 9. Then we enter these specifications into the TSCM to come up with a TSCM estimated price for each vessel (NOTE: because we are in the process of finalizing prices for the latest quarter, in this case the fourth quarter of 2006, the TSCM estimated price for this quarter is based on our forecast prices from the third quarter of 2006.) We also enter our benchmark vessel (in this case, a 74,000 dwt 5 year-old geared bulker) into the TSCM to come up with a Marsoft benchmark price of \$41.7 million. For each transaction, we add or subtract the difference between the actual price and the estimated price from the benchmark price to come up with an adjusted price as follows:

$$\text{Adjusted Price} = \text{Benchmark Price} - (\text{Estimated} - \text{Actual}) \text{ Price}$$

For example, the TSCM estimate of the price for the Zella Oldendorff was \$40 million, when it actually sold for \$41 million. This indicates that we should adjust the 5 year-old price of our benchmark Panamax bulker up by \$1.0 million. Thus the adjusted price in this case is \$42.7 million (\$41.7 + 1.0).

Once we have an adjusted price for each vessel, we take the average for each month of the quarter, and average these to come up with the benchmark price for the quarter. In this example, the benchmark price for our 5-year old Panamax bulker comes out to \$44.9 million. This indicates that, based on actual transactions during the quarter, our forecast of \$41.7 million for a 5 year old Panamax bulker was \$3.2 million too low, the result of a rapidly rising market.

Finally, we compare these quarterly average adjusted prices to brokers' estimates and client survey responses to come up with our finalized secondhand prices, which appear in the line "actual benchmark price" in the table above. The actual benchmark prices for a given quarter typically fall within +/- 5% of the quarterly average adjusted prices. The chart below shows the 06q4 benchmark 5-year and 10-year prices relative to reported transactions in 06q4.

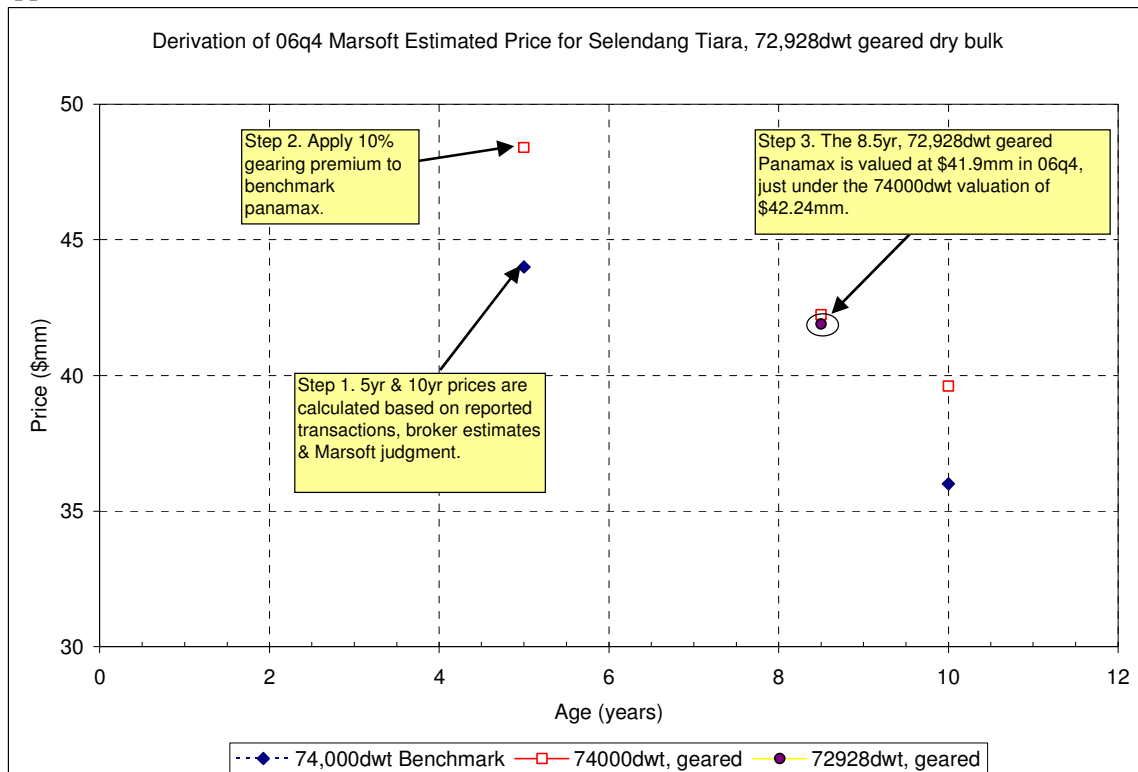


When comparing Marsoft’s quarterly average price estimates with broker estimates, we acknowledge a bandwidth around our prices depending on whether the broker valuation took place at the beginning or the end of a quarter. For example, Marsoft’s benchmark price for a 10-year old 74,000 dwt Panamax Bulker in 2006 Q4 was \$36 million. Meanwhile, Clarkson’s reported price for a 10-year old 69,000 dwt Panamax, which stood at \$32.5 million at the end of September, rose from \$34 million at the beginning of October to \$37 million by the end of December, and then to \$38.5 million at the start of 2007. While the quarterly average price reported by Clarkson’s (\$35 million) is not very different from Marsoft’s estimate for a slightly larger vessel (\$36 million), the difference between the Marsoft and broker estimates could be significant when the market is moving quickly and depends on when the valuation is done.

**Step 3. Estimating the price of a specific ship based on vessel specification**

The process of estimating a vessel’s value is complex; the vessels in a given market segment naturally vary in size, age, hull type, and other characteristics, so their prices are not easily comparable. To address these issues, we apply adjustment factors for size, age, hull type and other characteristics specific to the vessel to calculate the market value for a ship.

To illustrate how TSCM estimates the price of the Selendang Tiara, we start by looking at our 74,000 dwt benchmark prices in 2006q4, which were \$44 million for a 5-year old and \$36 million for a 10-year old ship, as derived in steps (1) and (2) above. As our benchmark Panamax bulker is a non-g geared vessel, TSCM applies a gearing premium<sup>2</sup> to the benchmark to match the specifications of the Selendang Tiara. Next, the model adjusts for the size our specific vessel by interpolating between our Handymax and Panamax vessels, and estimates the 8.5-year old price based on the price development between the 5-year old and 10-year old benchmarks. This approach is shown in the chart below.



<sup>2</sup> The gearing premium changes with a vessel’s size (approximately 20% premium for a Handymax, compared with 10% for a Panamax, and a weighted average of the two for sizes in between) and age (steadily decreases to zero as the vessel approaches scrap age).

The 2006q4 valuation for the Selendang Tiara comes in at \$41.9 million, just under the \$42.24 million valuation of a geared benchmark vessel.

Marsoft follows the same process for collecting reported transactions, translating them to a benchmark price, and estimating the price of a specific ship based on the vessel's specification in the tanker and containership markets.