

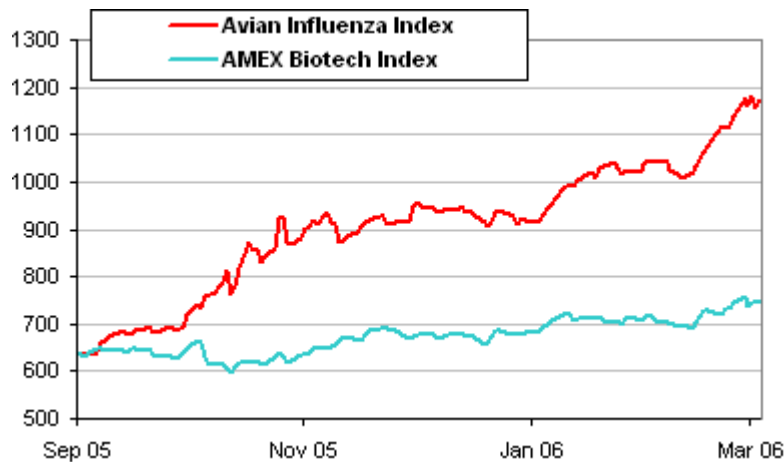
THOUGHT CONTAGIONS

## Avian Flu: Risk and Opportunity

Monday, March 6, 2006

Donald Luskin

When infected birds show up on US soil this year, it will be a further windfall for biotech companies.



Normally we try to encourage clients to ignore all the **doom-and-gloom** stories that seem to dominate investment discourse nowadays. But this one is different. We think that the possibility of a **pandemic of A(H5N1) influenza** -- or "avian flu" -- is worth taking seriously. Reports in the last several weeks of infected birds appearing in **Africa, Europe** and the **Middle East** -- and 17 more human deaths year-to-

date -- have substantially changed **risk perceptions**. An equal-weighted portfolio of 17 stocks of companies involved in **testing, therapeutics, or vaccines** for avian flu has broken out to new highs. This follows several months of consolidation after another large up-move last September, which was the result of another wave of human deaths. The move in the last couple weeks has corresponded to a new consensus among public health experts that the pattern now observed in the appearance of infected birds, in terms of time and geography, is convincing evidence that the A(H5N1) is now being transmitted around the world by **natural migration** -- and at the same time by some other process that is not at all understood. Through migration alone, there is a good chance that infected birds will start showing up in the **United States** and across the **Americas** sometime later this year. The online futures contracts traded at **Tradesports.com** set the probability at 35% by mid-year, and 65% by year-end.

The investment play here is not based on an assumption that a pandemic will actually occur. Rather, it is based on the idea that a pandemic is worth spending a great deal of money to prevent. This is especially true in the post-**Katrina** world, in which the political costs of the perception of lack of preparedness are quite high (recall that **President Bush** was promising to be prepared for an avian flu outbreak while **New Orleans** was still underwater). Companies involved in testing, therapeutics, or vaccines -- no matter how speculative -- are already experiencing windfalls. For example, **Gilead Sciences** has been the beneficiary of enormous stockpiling of its therapeutic drug **Tamiflu** by governments around the world, even though it has not been shown so far to be of much use at all in treating patients infected with A(H5N1).

Yet more money will be spent on Tamiflu, and a host of other technologies that may or may not do any good, even though there is only a very low probability that the worst-case scenario of a

true pandemic might occur. That's because if it does, it will be catastrophic nearly beyond imagining. As a baseline, consider the "**Spanish flu**" pandemic of 1918, killed 50 million people world-wide, and was also avian in origin. Adjusted for today's population, that would be 177 million dead, including two million in the United States. For our nation, that's the equivalent of every death from the September 11, 2001 terrorist attacks, plus every death from Hurricane Katrina, plus a year's worth of highway fatalities -- times 45. But an A(H5N1) pandemic would probably be worse than that baseline. The 1918 strain killed about a third of the people who became infected -- so far, A(H5N1) is killing more than half. Many people had natural immunities to the 1918 strain. A(H5N1) is so biologically unusual that no one alive today has immunity. The only factor suggesting that a pandemic today might be less devastating than that of 1918 is the advance of medical technology and public health over the last 88 years. Indeed, the investment opportunity here is driven by just that.

For a pandemic to occur in the first place, A(H5N1) would have to mutate into a strain that is capable of being efficiently transmitted between humans. We have noticed that many commentaries on avian flu make the reassuring claim that there have so far been no cases of **human-to-human transmission**, but according to the **World Health Organization** there has already been at least one such case (in **Thailand**). In dozens of other cases, there seems to be no explanation at all for how victims became infected, having had no known contact either with infected birds or infected humans.

If a pandemic were to occur today, there would be no way to blunt its consequences to any large extent. Flu vaccines cannot be developed until the precise strain to be combated has appeared and been analyzed. Then the development pipeline takes at least two months to work through. After that, global vaccine manufacturing capacity is currently sufficient to make only 300 million doses per year (provided it were dedicated solely to this goal). Currently there is almost no vaccine manufacturing capacity on US soil. In a pandemic, it is not at all clear how 300 million doses would be distributed among 6.5 billion souls. What we can be sure of is that the world economy would experience massive losses of **human capital**, and undergo massive disruption as various forms of local and cross-border **quarantine** were imposed to minimize the spread of the disease. That is a future worth spending money to prevent.

**Bottom line:** The avian flu problem is getting riskier, and this is showing up clearly in the rising stock prices of companies involved in testing, therapeutics, and vaccines. Many of these companies have very small capitalizations, low prices, and products that are still entirely unproven. Their stock prices have already had quite a run recently -- up 24% on average year-to-date -- as infected birds have appeared in Europe, Africa and the Middle East. While these are momentum stocks now, it wouldn't be a surprise for them to rest for a while here. This should make an excellent buying opportunity. We believe that more government money from around the world will be spent with these companies as risk perceptions continue to heighten, and the clamor to "do something" intensifies. We can expect risk perceptions to move to new highs when infected birds start showing up on American soil. Collectively, the stocks in the table below should move to new highs at the same time. We do not do detailed analysis of individual companies, so we offer this list as an **Avian Influenza Index** (as charted above), a broad representation of an investment theme which, we believe, has much further to run.

Company	Symbol	Market cap (millions)	Price Mar 3, 2006	Opportunity
Anylam Pharma	ALNY	\$541	\$17.04	RNAi therapeutics, Novartis partnership
Avant Immunothp	AVAN	\$148	\$1.99	Vitrilife vaccine development
AVI Biopharm	AVII	\$378	\$7.34	NeuGene antisense therapeutics

Biocryst Pharma	BCRX	\$597	\$20.75	Peramivir therapeutic
Carrington Labs	CARN	\$65	\$6.05	Nasal vaccine development, Invitrogen partnership
Chiron Corp	CHIR	\$8,943	\$45.27	Vaccine manufacturing
Crucell	CRXL	\$915	\$24.85	Vaccine development, Aventis partnership
Embrex Inc	EMBX	\$98	\$11.99	Inovoject poultry vaccination
Gilead Sciences	GILD	\$27,516	\$60.09	Tamiflu licensor to Roche
Generex Biotech	GNBT	\$147	\$2.32	Antigen Express synthetic vaccine
Hemispherx Bio	HEB	\$191	\$3.53	Ampligen vaccine adjuvant
Medimmune Inc	MEDI	\$9,018	\$36.65	FluMist vaccine delivery
Nastech Pharma	NSTK	\$295	\$14.28	RNAi therapeutics
Novavax Inc	NVAX	\$265	\$5.40	Virus-like particle vaccine
Quidel Corp	QDEL	\$390	\$11.86	Quik-Vue point-of-care diagnostics
Sinovac Biotech	SVA	\$151	\$3.83	Vaccine manufacturing, China
Vical Inc	VICL	\$138	\$4.89	DNA vaccine development

**Disclosure:** the author of this report owns positions in all of these stocks. His positions may be changed at any time without notice. 