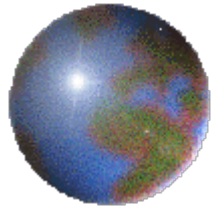




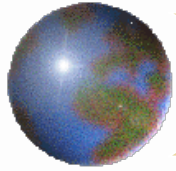
# INDIA WORKSHOP



## Energy Security: India in Comparative Perspective

**Dennis Encarnation**  
Harvard University

**10 November 2008**



# WEALTH & ENERGY CONSUMPTION, 2007

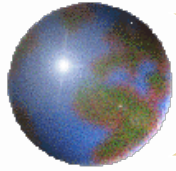
**2007 GDP AT PPP FX RATES**  
(US\$ trillion)

**2007 OIL CONSUMPTION**  
(million tons)

	<b>WORLD</b>	<b>64.9</b>			<b>WORLD</b>	<b>3,953</b>
	<b>EU</b>	<b>14.7</b>			<b>EU</b>	<b>704</b>
<b>1.</b>	<b>USA</b>	<b>13.8</b>		<b>1.</b>	<b>USA</b>	<b>943</b>
<b>2.</b>	<b>CHINA</b>	<b>7.0</b>		<b>2.</b>	<b>CHINA</b>	<b>368</b>
<b>3.</b>	<b>JAPAN</b>	<b>4.3</b>		<b>3.</b>	<b>JAPAN</b>	<b>229</b>
<b>4.</b>	<b>INDIA</b>	<b>2.8</b>		<b>4.</b>	<b>INDIA</b>	<b>129</b>
<b>5.</b>	<b>GERMANY</b>	<b>2.8</b>		<b>5.</b>	<b>RUSSIA</b>	<b>126</b>
<b>6.</b>	<b>UK</b>	<b>2.1</b>		<b>6.</b>	<b>GERMANY</b>	<b>113</b>
<b>7.</b>	<b>RUSSIA</b>	<b>2.1</b>		<b>7.</b>	<b>SOUTH KOREA</b>	<b>108</b>
<b>8.</b>	<b>FRANCE</b>	<b>2.0</b>		<b>8.</b>	<b>SAUDI ARABIA</b>	<b>99</b>
<b>9.</b>	<b>BRAZIL</b>	<b>1.8</b>		<b>9.</b>	<b>BRAZIL</b>	<b>97</b>
<b>10.</b>	<b>ITALY</b>	<b>1.8</b>		<b>10.</b>	<b>FRANCE</b>	<b>91</b>

Source: IMF & World Bank, April 2008; US Department of Defense, 2007.

**The Geographic Concentration Of Wealth & Of Oil Consumption  
Are Highly Correlated--8 Of The Top 10 Are The Same--  
So The Security of Oil Supplies is Essential to Economic Growth**



# WEALTH & MILITARY SPENDING, 2007

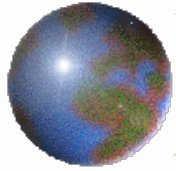
**2007 GDP AT PPP FX RATES**  
(US\$ trillion)

**2006-07 MILITARY BUDGETS**  
(US\$ billion)

	<b>WORLD</b>	<b>64.9</b>			<b>WORLD</b>	<b>1,367</b>
	<b>EU</b>	<b>14.7</b>			<b>US ALLIANCES</b>	<b>307</b>
<b>1.</b>	<b>USA</b>	<b>13.8</b>		<b>1.</b>	<b>USA</b>	<b>644</b>
<b>2.</b>	<b>CHINA</b>	<b>7.0</b>		<b>2.</b>	<b>CHINA</b>	<b>122</b>
<b>3.</b>	<b>JAPAN</b>	<b>4.3</b>		<b>3.</b>	<b>RUSSIA</b>	<b>59</b>
<b>4.</b>	<b>INDIA</b>	<b>2.8</b>		<b>4.</b>	<b>UK</b>	<b>55</b>
<b>5.</b>	<b>GERMANY</b>	<b>2.8</b>		<b>5.</b>	<b>FRANCE</b>	<b>45</b>
<b>6.</b>	<b>UK</b>	<b>2.1</b>		<b>6.</b>	<b>JAPAN</b>	<b>41</b>
<b>7.</b>	<b>RUSSIA</b>	<b>2.1</b>		<b>7.</b>	<b>GERMANY</b>	<b>36</b>
<b>8.</b>	<b>FRANCE</b>	<b>2.0</b>		<b>8.</b>	<b>SAUDI ARABIA</b>	<b>25</b>
<b>9.</b>	<b>BRAZIL</b>	<b>1.8</b>		<b>9.</b>	<b>SOUTH KOREA</b>	<b>24</b>
<b>10.</b>	<b>ITALY</b>	<b>1.8</b>		<b>10.</b>	<b>INDIA</b>	<b>22</b>

Source: IMF & World Bank, April 2008; US Department of Defense, 2007.

**The Geographic Concentration Of Wealth & Of Military Spending Are Also Highly Correlated--Again, 8 Of The Top 10 Are The Same-- So Military Security is Essential for Economic Growth**



# MILITARY SPENDING & ENERGY CONSUMPTION

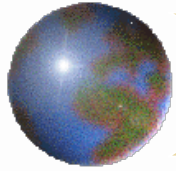
**2006-07 MILITARY BUDGETS**  
(US\$ billion)

**2007 OIL CONSUMPTION**  
(million tons)

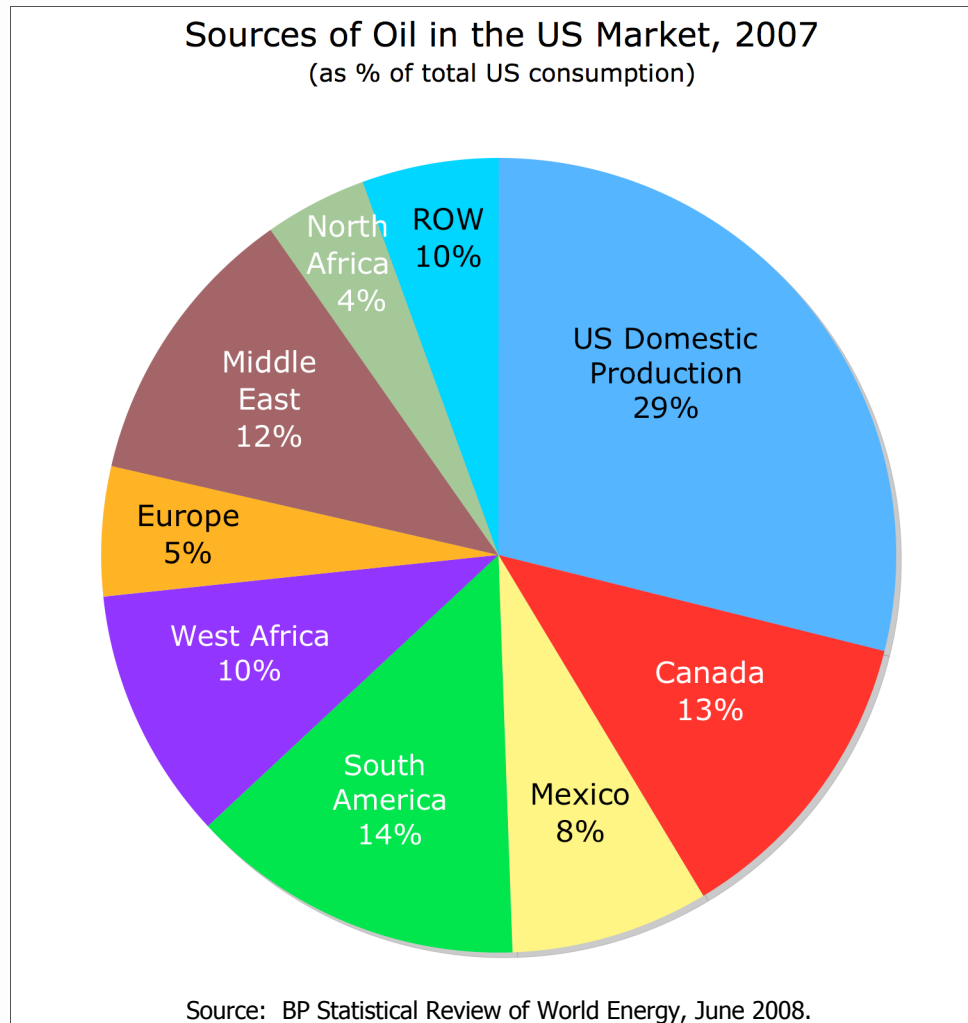
	<b>WORLD</b>	<b>1,367</b>		<b>WORLD</b>	<b>3,953</b>
	<b>US ALLIANCES</b>	<b>307</b>		<b>EU</b>	<b>704</b>
<b>1.</b>	<b>USA</b>	<b>644</b>	<b>1.</b>	<b>USA</b>	<b>943</b>
<b>2.</b>	<b>CHINA</b>	<b>122</b>	<b>2.</b>	<b>CHINA</b>	<b>368</b>
<b>3.</b>	<b>RUSSIA</b>	<b>59</b>	<b>3.</b>	<b>JAPAN</b>	<b>229</b>
<b>4.</b>	<b>UK</b>	<b>55</b>	<b>4.</b>	<b>INDIA</b>	<b>129</b>
<b>5.</b>	<b>FRANCE</b>	<b>45</b>	<b>5.</b>	<b>RUSSIA</b>	<b>126</b>
<b>6.</b>	<b>JAPAN</b>	<b>41</b>	<b>6.</b>	<b>GERMANY</b>	<b>113</b>
<b>7.</b>	<b>GERMANY</b>	<b>36</b>	<b>7.</b>	<b>SOUTH KOREA</b>	<b>108</b>
<b>8.</b>	<b>SAUDI ARABIA</b>	<b>25</b>	<b>8.</b>	<b>SAUDI ARABIA</b>	<b>99</b>
<b>9.</b>	<b>SOUTH KOREA</b>	<b>24</b>	<b>9.</b>	<b>BRAZIL</b>	<b>97</b>
<b>10.</b>	<b>INDIA</b>	<b>22</b>	<b>10.</b>	<b>FRANCE</b>	<b>91</b>

Source: IMF & World Bank, April 2008; BP Statistical Review of World Energy, June 2008.

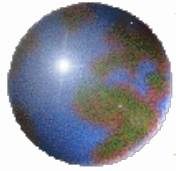
**The Geographic Concentration Of Military Spending & Oil Consumption Are Very Highly Correlated-- This Time, 9 Of The Top 10 Are Identical**



## SHORT ENERGY SUPPLY LINES: U.S. IN 2007



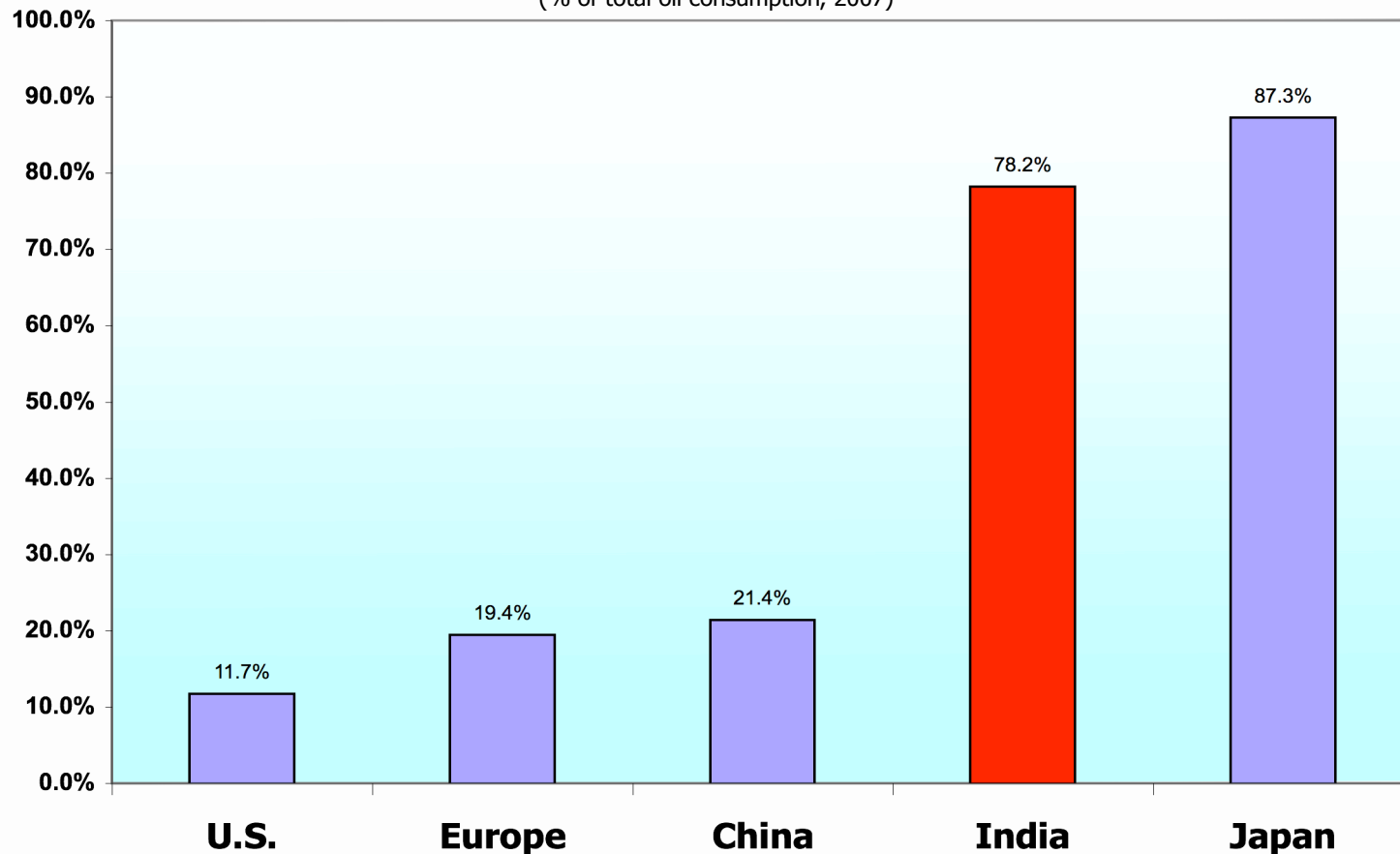
**North American Sources (US, Canada, Mexico) = 50%**  
**North + South American Sources = 64%**  
**Atlantic Basin Sources (Americas + West Africa) = 79%**



# EXPOSURE TO GULF SUPPLIERS, 2007

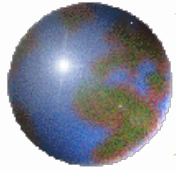
## Dependence on Middle East Oil

(% of total oil consumption, 2007)



Source: BP, Energy Statistical Review, 2008.

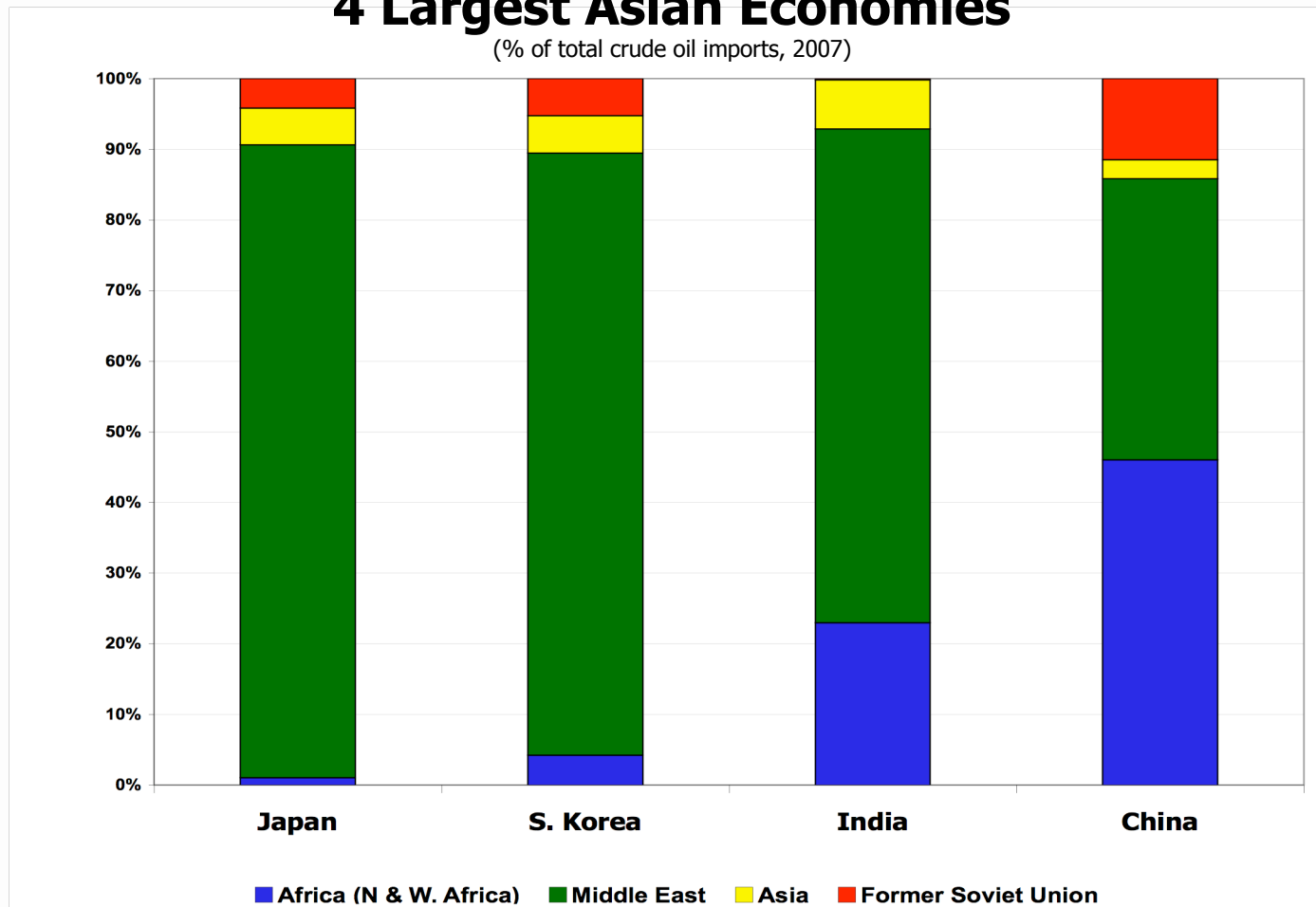
**Wide Variation in Relative Exposures to the Risks of Longer Supply Lines & Middle East Instability, with Asian Economies More Directly Exposed**



## LONG SUPPLY LINES: ASIAN IMPORTERS, 2007

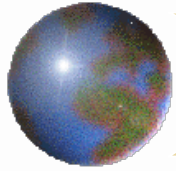
### The Source of Crude Oil Imports in the 4 Largest Asian Economies

(% of total crude oil imports, 2007)



Source: Energy Security Analysis, Inc., 2007.

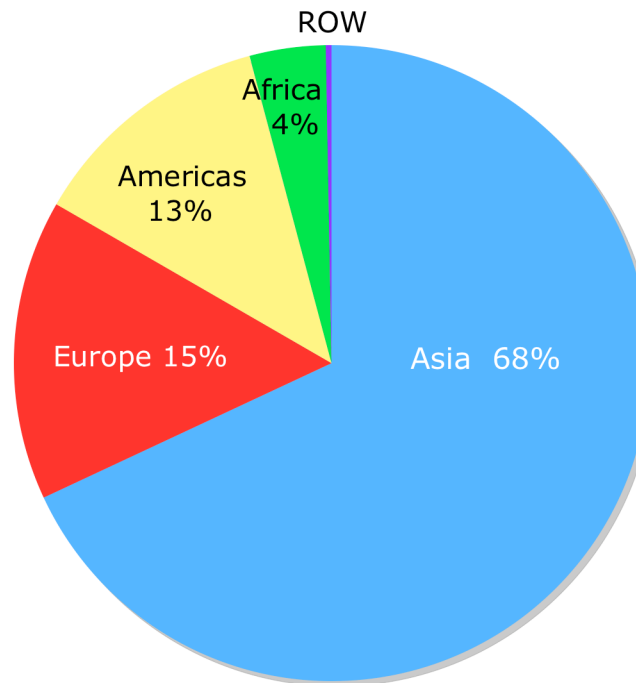
**For Asian Importers, The Security of Energy Supply Lines Originating In The Gulf and, Increasingly, Africa is Essential for Continued Growth**



## LONG ENERGY SUPPLY LINES: GULF EXPORTERS, 2007

### REGIONAL DESTINATION OF MIDDLE EAST OIL EXPORTS, 2007

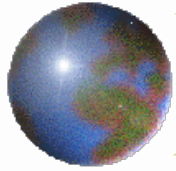
% of total 975 million tons exported



Source: BP Statistical Review of World Energy, June 2008.

**For Middle East Exporters, The Security of Long Supply Lines Is Essential to Their Continued Economic Growth**





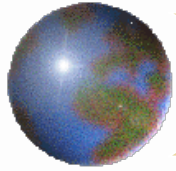
## INTRA-REGIONAL & CROSS-REGIONAL SUPPLY LINES

### 7 Largest Cross-Border Flows of Fuels

Cross-National Flows*	Exports (US\$ million)	Annual Change		
		2000-06	2005	2006
	2006			
<b>Middle East to Asia</b>	<b>\$ 323.3</b>	<b>161%</b>	<b>42%</b>	<b>181%</b>
Intra-Europe	\$ 196.7	19%	44%	24%
Intra-Asia	\$ 177.2	146%	39%	18%
CIS to Europe	\$ 139.2	25%	50%	28%
Intra-North America	\$ 120.9	120%	38%	10%
Africa to Europe	\$ 80.9	15%	47%	22%
Middle East to Europe	\$ 59.5	11%	42%	14%

Source: WTO, 2008. Notes: \*This figure includes limited mining products

**Asia Has Limited Regional Sources of Fuels, in Marked Contrast to Europe and North America, Leaving It Exposed To The Risks of Longer Supply Lines Crossing More Unstable Parts of the World**



# MILITARY SPENDING & ENERGY CONSUMPTION

**2006-07 MILITARY BUDGETS**  
(US\$ billion)

**2007 OIL CONSUMPTION**  
(million tons)

	<b>WORLD</b>	<b>1,367</b>		<b>WORLD</b>	<b>3,953</b>
	<b>US ALLIANCES*</b>	<b>307</b>		<b>EU</b>	<b>704</b>
<b>1.</b>	<b>USA</b>	<b>644</b>	<b>1.</b>	<b>USA</b>	<b>943</b>
<b>2.</b>	<b>CHINA</b>	<b>122</b>	<b>2.</b>	<b>CHINA</b>	<b>368</b>
<b>3.</b>	<b>RUSSIA</b>	<b>59</b>	<b>3.</b>	<b>JAPAN</b>	<b>229</b>
<b>4.</b>	<b>UK</b>	<b>55</b>	<b>4.</b>	<b>INDIA</b>	<b>129</b>
<b>5.</b>	<b>FRANCE</b>	<b>45</b>	<b>5.</b>	<b>RUSSIA</b>	<b>126</b>
<b>6.</b>	<b>JAPAN</b>	<b>41</b>	<b>6.</b>	<b>GERMANY</b>	<b>113</b>
<b>7.</b>	<b>GERMANY</b>	<b>36</b>	<b>7.</b>	<b>SOUTH KOREA</b>	<b>108</b>
<b>8.</b>	<b>SAUDI ARABIA</b>	<b>25</b>	<b>8.</b>	<b>SAUDI ARABIA</b>	<b>99</b>
<b>9.</b>	<b>SOUTH KOREA</b>	<b>24</b>	<b>9.</b>	<b>BRAZIL</b>	<b>97</b>
<b>10.</b>	<b>INDIA</b>	<b>22</b>	<b>10.</b>	<b>FRANCE</b>	<b>91</b>

Source: IMF & World Bank, April 2008; BP Statistical Review of World Energy, June 2008.

**Once Again: The Geographic Concentration Of Military Spending  
& Oil Consumption Are Very Highly Correlated--  
9 Of The Top 10 Are Identical**