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## HIGHLIGHTS

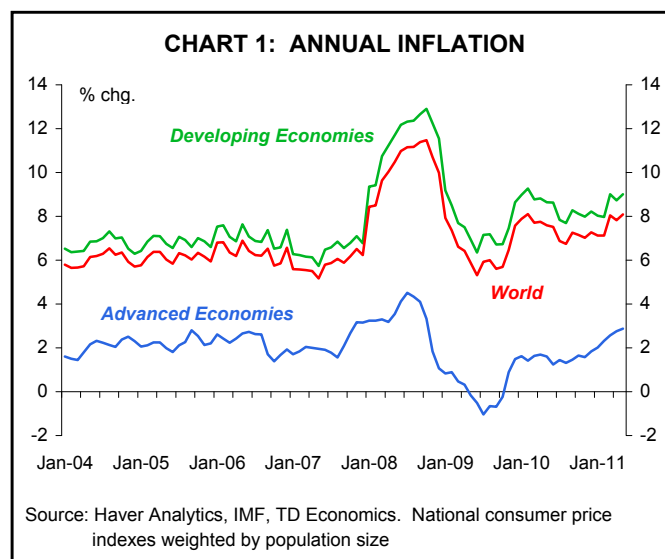
- The final surge of the long bull commodities market prior to 2008 coincided with the sharp increase in inflation, and, since early last year, the same story has been playing out again.
- Although many commentators believe financial speculation has been a catalyst of a “bubble” in commodity prices, empirical evidence has failed to support that claim.
- Others argue that a major contributing factor have been rising wages in China, which are putting an end to decades-long cheap imports...but here too we disagree.
- Our view is that global commodity supply has struggled to keep up with the pace of global demand, driving commodity prices higher.
- This factor has been compounded by very lax monetary conditions, causing inflation to rise both prior to the global recession and again in recent quarters.
- However, while inflation still poses a global risk, the most likely outcome is for inflationary pressures to moderate over the coming year.

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## SLOWER GROWTH AND TIGHTER MONETARY CONDITIONS TEMPER GLOBAL INFLATION

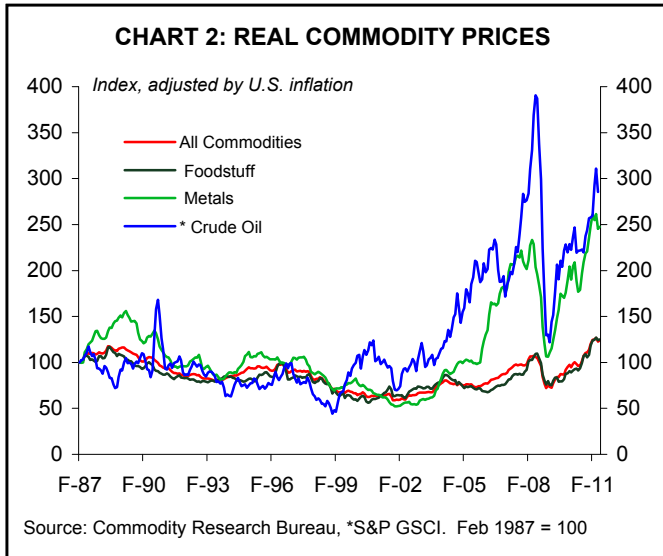
In the run up to the 2008 financial crisis, global inflation more than doubled, both in advanced and emerging economies, over a period of less than a year-and-a-half. In advanced economies, annual inflation peaked at 4.5% in July 2008; in emerging economies it did so a few months later, reaching almost 12%. The ensuing global recession tamed inflation, but ever since the recovery took hold, inflation has accelerated. This is in large part due to an escalation of food and energy prices, which hit emerging markets particularly hard since these commodities account for roughly double the share of consumer spending relative to advanced economies.

Some market pundits (and political leaders) believe that speculators are largely to blame for the quick resurgence in commodity prices. Others argue that a major contributing factor is rising wages in China, which are putting an end to cheap imports. We put both notions to the test and found that neither can be substantiated. Rather, the predominant influence ties back to the simple economic notion of supply and demand. Global commodities supply has struggled to keep up with the pace of global demand growth; which in combination with very lax monetary conditions across much of the world, has caused inflation to rise both prior to the global recession and in the recent period. How long will this last? The recent pull back in commodity prices, combined with tighter monetary conditions across emerging market economies and moderate growth prospects for advanced economies suggests inflationary pressures will abate in the coming quarters.



### Financial Speculation in Commodity markets: guilty or innocent?

The argument that financial speculation has been a major driver of the wild increases in commodity prices observed in recent years has become so popular, that it almost goes uncontested by many financial market participants and government authorities. In particular, public scrutiny has focused on the investment activities of long-only commodity index funds, whose objective is to profit from rising commodity prices without ever owning the physical commodity. To do so, investors buy futures contracts, which they sell prior to expiration. The proceeds are reinvested into a new, longer maturity future contract for the same commodity. Those who point the finger at commodity speculation argue that ballooning commodity prices



have coincided with a massive increase in non-commercial futures investments contracts. According to data from the U.S. Commodity Futures Trading Commission, net long investment index exposure went from US\$15 billion in 2003 to US\$255.8 billion by the end of April 2011. Detractors of these funds argue that this behavior generates artificial demand for the commodity, inflating its price, and distorting the price discovery process to which futures markets are supposed to contribute.

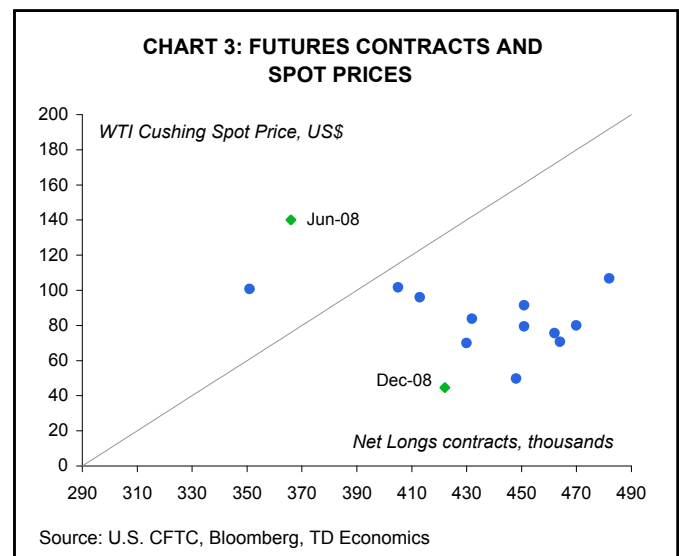
The hypothetical arbitrage mechanism through which futures' prices could influence spot prices goes as follows: if the price of a certain commodity in a future contract is higher than the spot price of that commodity plus the transaction costs incurred by hoarding and delivering the commodity in the future, an arbitrageur would sell the future contract and buy the physical commodity, store it until the delivery date of the future contract, and then settle the contract at expiration realizing a profit. This would drive demand for that commodity up, increasing the spot price.

In addition, there is also the role futures' prices play in providing signals for both producers and consumers of the commodity, and could therefore affect pricing decisions in the spot market. If, for instance, future contract prices are rising, that might prompt producers to hoard their commodities to gain a future profit. This, in turn, creates a supply shortage that drives prices up today in the spot market.

Since this debate erupted in early 2008, a myriad of research papers have been written to assess whether long-only commodity funds have affected commodity prices. Naturally, there is empirical evidence both supporting as well as rejecting the "speculative commodities' bubble" hypothesis.<sup>1</sup>

However, one of the major shortcomings of those subscribing to the hypothesis of speculation-driven prices is that they have not been able to prove that the sharp increase in index investments has led to a commensurate increase in demand for the physical commodity. This is in part because of the fact that long-only funds do not accept physical delivery. Alternatively, we could assume that it is the seller of the future contract who is driving up demand, by buying and hoarding the commodity, with no other intention than to hedge its exposure to the future contract.<sup>2</sup> This would indeed generate additional demand for the physical commodity. However, for this to be a reasonable explanation of the sharp recent increase in spot commodity prices, we would expect to observe concomitantly a significant increase in the number of future contracts originating from index investment. Let's take for example the case of crude oil. According to the S&P Goldman Sachs Commodity Index, during the period March 2009 – April 2011 the price of crude oil adjusted by inflation increased by 115%. In March 2009, the U.S. Commodity Futures Trading Commission reported 448 thousand net long index investment contracts in WTI crude oil. The equivalent figure reached 473 thousand at the end of April 2011. This represents a potential increase in crude oil demand stemming from commodity index investments in the order of 25 million barrels, or a mere 28% of just one day's worth of global crude oil production.<sup>3,4</sup>

It seems unreasonable to conclude that such a tiny fraction of global crude oil supply could explain a sizeable portion of the more than doubling of the real crude oil price during that multi-year period. Furthermore, at the peak of the 2008 commodities' boom, net longs on WTI were reported at 366 thousand contracts. Six months later, the price



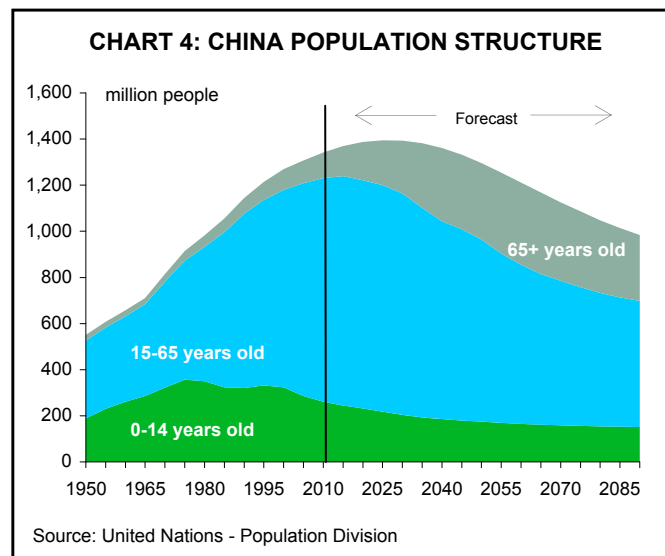
of crude oil had lost 67%, but index investments net longs had actually increased to 422 thousand contracts. Chart 3 shows that there is no strong correlation between net long WTI future contracts and its spot price. This prima facie would suggest that if speculative investments unduly affect spot prices, they are just a secondary contributing factor among many other causal forces driving price movements in the physical market.

Indeed, it is market fundamentals and other factors that explain most of the fluctuation in the real price of crude oil and other commodities observed prior to the financial crisis, and then again since mid-2009. The 2007-08 crude oil price shock was most likely caused by strong demand confronting stagnating production at a global level.<sup>5</sup> Moreover, shocks to the aggregate global demand for industrial commodities and demand shocks specific to the oil-market (such as an increase in precautionary oil demand due to political instability in the Middle East) have a much larger impact on the real price of oil than crude oil supply shocks.<sup>6</sup> These facts are more in line with the view that rapidly growing demand from emerging markets, especially China, is the predominant driving force behind the rise in commodity prices in recent years. We will discuss this issue shortly, but first let's look at another potential culprit for stoking global inflation that has been recently making headlines: rising Chinese wages.

### China's demographics: the end of cheap labor and rising global inflation

Stories about fierce competition among Chinese manufacturers to attract workers into their factories and sharply rising wages have been recurring news since the middle of last year. This has been associated with the fact that working-age population has almost peaked in China, and that its subsequent decline will begin to increasingly impact global prices, given the key role the Asian country plays as a global producer of manufactured goods. However, there are a number of considerations to be made with regards to the latter assertion.

First, according to projections from United Nations, China's working-age population – those aged between 15 and 64 – is set to peak sometime between now and 2015. Moreover, although working age population will begin to decline afterwards, the ratio of urban-to-rural population will still be climbing well past that point. Urban population is forecast by the UN to reach 58% of the total in 2025 from 47% today. To provide a reference point as to how far the urbanization process can go, Canada's urban population stands at 80.6% and it is expected to reach 82.9% in 2025.



The equivalent figures for the U.S. stand at 82.3% and 85.9%, respectively. This means China will still be adding workers to its manufacturing and service sectors – to the detriment of agriculture employment – long after its working age population has started to contract. The speed at which that process occurs relative to the demand for new workers in urban centers will be the crucial element determining the evolution of real wages.

A second caveat has to do with the increase in wages relative to productivity. Table 1 shows that real wages – nominal wages adjusted for inflation – have risen at an average annual rate of 9.5% since 2004, with manufacturing real wages registering a smaller 8.4% increase. This would suggest labor costs per unit of labor have significantly risen in China in recent years. However, the Asian country has also recorded strong productivity gains: output per worker grew, on average, 10.3% per year during the same period. Therefore, as long as productivity gains track real wage increases closely, labor costs per unit of output will remain contained.

In addition, labor costs represent a relatively small share of the total production cost: a survey of 7,900 Chinese firms put labor costs below 10% of total cost for roughly 46% of the firms surveyed, and below 20% of total cost for 80% of them. This limits the impact of higher wages on overall Chinese export prices.<sup>7</sup>

Furthermore, according to research from the New York Fed, a large share of the increase in prices of U.S. imports from China has been explained by a sharp rise in industrial supplies' import prices. Indeed, despite its low share of total Chinese exports to the U.S. (15% in 2007), a roughly 40% increase in the price of industrial supplies drove overall

**Table 1: Average Wages Real Annual Growth \***

Financial Intermediation	14.48
Mining	12.82
Wholesale and Retail Trade	11.85
Scientific Research	10.32
Education	10.23
Transport, Storage & Post	9.26
Electricity, Gas & Water	9.12
Public Management and Social Organization	8.92
Health, Social Securities and Social Welfare	8.76
Farming, Forestry, Animal Husbandry	8.65
Manufacturing	8.39
Construction	8.37
Culture, Sports and Entertainment	8.35
Leasing & Business Services	7.60
Water Management, Environment	7.08
Services to Households and Other Services	6.88
Hotel and Restaurants	6.32
Real Estate	6.14
Info Transmission, Computer Service & Software	5.75
All-sector average	9.55

Source: Haver, TD Economics - \* inflation adjusted using the GDP deflator, avg. 2004-2010

U.S. import prices from China up by close to 10% during 2004-08. On the other hand, consumer and capital goods imports from China – which combined accounted for the remainder 85% of total Chinese exports to the U.S. – only saw price increases of roughly 7% and 4%, respectively, during the same period. Given the high share of industrial commodity inputs required for the production of industrial supplies imports, rising commodity prices – especially during 2006-08 – were one of the major factors for the rise in U.S. import prices from China.<sup>8</sup> Thus, rather than the reflection of higher Chinese wages, rising Chinese export prices are a consequence of the increase in commodity prices that China’s own growing demand has fueled in recent years. We delve into this issue next.

### China’s burgeoning demand fuels global inflation

Due to rapid industrialization, urbanization, and income growth, China has been expanding its consumption of commodities at an impressive speed. Moreover, relocation of manufacturing activities to China from countries that are more energy-efficient may also have increased global energy demand. In 2001, China accounted for 6%, 13%, 14% and 27% of the total world consumption of crude oil, copper, aluminum and iron ore, respectively. Prior to the global recession, those shares had jumped to 9%, 30%, 33% and 58%, respectively.<sup>9</sup> This meant that China contributed to roughly

one third of the increase in global crude oil consumption during a six year period; whereas for copper, aluminum and iron ore the contribution to the increase in global demand was estimated at 51%, 56% and 89% respectively. It is, therefore, not surprising that China’s demand is estimated to have accounted for between 15% and 30% of the price increase for copper during 2003-2006, and up to 35% of the increase in the price of crude oil during the same period.<sup>10</sup>

### Emerging Markets Monetary conditions: a bit too much stimulus

Credit growth is another very important factor that has facilitated the escalation of inflation across emerging markets in recent years. Table 2 shows the difference between nominal credit growth and nominal GDP growth for a group of leading developing economies. It is worth mentioning that these countries together account for roughly 19% of global GDP.

As is evident, they have been expanding their credit supply at a brisk pace. Over the last two years, such lax monetary environment has coexisted with very tight labor markets, economies operating at full capacity, and stimulatory fiscal policies. If, on top of these, we add the sharp increases in global commodity prices, it seems natural to obtain rampant inflation. Moreover, in relation to this argument, research from the Bank of International Settlements that analyzed the sensitivity of domestic inflation to changes in domestic and global output gaps found that different measures of the global output gap significantly contribute to explain domestic inflation dynamics in several OECD countries, even after other factors such as import and crude oil prices had been included in the analysis.<sup>11</sup>

### Final Remarks

We have discussed in detail two arguments often cited as key drivers of global inflation in recent years. There is no conclusive evidence that financial speculation has caused the dramatic increase observed in real commodity

**Table 2: Lax Monetary Conditions**

	Excess Credit Growth*	Total Credit (% of GDP)
Brazil (2004-2011)	9.5	48.4
China (2008-2011)	6.0	134.1
India (2001-2011)	5.6	72.5
Russia (2006-2011)	12.8	37.9
Turkey (2003-2011)	6.1	70.3

Source: Haver, TD Economics - \* Hodrick Prescott Trend Credit Growth minus nominal GDP annual growth, percentage points

prices since 2003. We tend to side with those who believe index commodity investments might be a minor contributor to the recent rise in commodity prices, but not a dominant influence.

With regards to the impact on global inflation stemming from changing Chinese demographics, our analysis suggests that it is still too early to attribute a sizeable inflationary impact to the decline in Chinese working age population.

Rather, we subscribe to the idea that strong global commodity demand caused by resilient emerging markets' growth, in an environment of very lax monetary conditions, has been met by less responsive global supply. These are the key forces behind the strong acceleration in global inflation since mid last year.

So, where is inflation headed? Global food and energy prices appear to have peaked, although they will remain elevated due to supply constraints. This means annual inflation will remain high in the short term, but it will diminish over the next few quarters.

As we highlighted in our latest [global quarterly economic forecast](#), most emerging market economies have taken actions to temper growth and reduce inflation. Tighter monetary and fiscal policies should pay dividends in the medium term. On the other hand, in advanced economies the dominant trend is modest economic growth in an environment of considerable economic slack. Thus, headline inflation rates should trend towards the projected lower levels of core inflation over time.



**Endnotes:**

- 1 For a comprehensive survey of the research conducted thus far, as well as some interesting empirical findings, see “Speculation and Financial Fund Activity: Draft Report”, Irwin, Scott and Dwight Sanders, OECD, May 2010.
- 2 This is an extreme assumption, as it is widely understood that the counterparties to long-only funds are generally producers or large scale users of those commodities who hedge their production and/or inventories, in which case their involvement in the future contract does not actually generate new demand for the commodity
- 3 IMF World Economic Outlook, average daily crude oil production of 89.4 million barrels.
- 4 There are concerns that the Index Investment data from the U.S. CFTC fails to capture the totality of speculative investment in commodities futures, due to the fact that investors can enter into commodity swaps contracts with investment banks, which in turn hedge their swap exposure via futures contracts. However the latter are registered as commercial users, instead of non-commercials as it is the case with index investments.
- 5 “Causes and Consequences of the Oil Shock of 2007-08”, Hamilton, James D. University of California at San Diego. March 2009.
- 6 “Not all oil price shocks are alike: Disentangling Demand and Supply Shocks in the Crude Oil Market”, Killian, Lutz. University of Michigan. February 2007.
- 7 “What’s Behind Volatile Import Prices from China?” Amiti, Mary and Donald R. Davis. Federal Reserve Bank of New York, Current Issues, January 2009
- 8 Ibidim
- 9 “China’s Factor in Recent Global Commodity Price and Shipping Freight Volatilities”. Lu, Feng and Li, Yuanfang. December 2009.
- 10 “China, Commodity Prices and Latin American Performance: Some Stylized Facts” Lehmann, Sergio; David Moreno, and Patricio Jaramillo. Central Bank of Chile, August 2007.
- 11 “Globalisation and inflation: New cross-country evidence on the global determinants of domestic inflation”. Borio, Claudio and Andrew Filardo. BIS Working Papers No 227. May 2007.

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