

# CONJONCTURE

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« Tomorrow belongs to those who can hear it coming. »

David Bowie

## History and major causes of US banking disintermediation

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By Céline Choulet and Yelena Shulyatyeva

## How long the Commodity Blues will play?

Have commodity prices hit bottom yet? How much longer will this period of low prices last? This article will try to answer these questions from the very long-term perspective of commodity supercycles. Our analysis suggests that prices will continue to decline. Looking beyond possible cyclical rebounds, the long-term downward phase is bound to continue until a new “structural growth engine” emerges as powerful as China over the past two decades, Europe in the post-war period and the United States in the late 19th century.

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By Anna Dorbec



ECONOMIC RESEARCH DEPARTMENT



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# History and major causes of US banking disintermediation

Céline Choulet and Yelena Shulyatyeva

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The US financial system is widely known to be substantially different from the euro area financial system. It is heavily market-dominated while financial systems in continental Europe remain universally bank-dominated. The relative size and role of the banks as compared to nonbank financial institutions and capital markets differ widely. The share of loans carried on bank balance sheets highlights the difference. In the euro area, bank loans<sup>1</sup> account for more than 70% of total lending to households and nonfinancial business whereas in the US, bank loans account for just under half this figure.

Yet, such a dominance of nonbanks and markets has not always been the case in the US. The US financial system has changed significantly over the past 35 years. In 1980, banks still held 60% of total debt instruments (loans and debt securities) held by the domestic financial sector<sup>2</sup>. While insurance companies and pension funds have long been important credit providers, other types of nonbank financial institutions such as Government-Sponsored Enterprises (GSEs), Asset-Backed Securities (ABS) issuers and mutual funds rose in prominence over the last few decades. As a result, total nonbank lending significantly outpaced bank lending beginning in the 1990s. By the late 1990s, all nonbank financial institutions held around two-thirds of total debt instruments while banks held the remaining third<sup>3</sup>. Since then, their respective shares have stayed relatively stable. The takeoff in overall capital markets financing of the US economy (debt securities, equities and mutual fund shares) also highlights the transformation in the financing model of the US economy. The debt and equity share surged from 40% in the 1970s to around 65% in the 2000s, and has remained substantial since then (the remaining part consisting in loans).

The history of US banking disintermediation may benefit the Europeans who are facing a challenge of altering how the economy is financed. However, preservation of bank loan supply remains crucial. In a traditional bank-dominated economy, banks take deposits from their customers and make loans to borrowers such as firms or households. These loans create more deposits. This means that lower bank lending may result in lower deposits. The term "banking disintermediation" refers to a situation where banks no longer hold the loans they originated on their balance sheets but sell them off; borrowers go directly to the capital markets rather than to banks to obtain a credit; or savers invest directly in securities, such as government and private bonds, asset-backed securities, stocks, rather than leaving their money in savings accounts on banks' balance sheets. Banking disintermediation does not mean that no more loans are originated. In a disintermediated economy, corporations rely more extensively on capital markets, but households still need loans. While these loans are originated by banks and nonbanks, most of them eventually are transformed into tradable securities.

These trends began to emerge in the US in the 1980s-1990s. However, there is no simple and univocal explanation to the process of disintermediation. It has resulted from a series of interdependent events, regulatory changes, policy decisions, historic events, macroeconomic conditions and cultural factors. In this paper, we explore the factors that we believe have contributed the most to banking disintermediation in the US.



First, we look back to the regulatory and legal framework, enacted in the 1930s-1940s, that, although with no intentional master-plan, created the necessary conditions for the development of a market-based financial system several decades later. Notably, as market interest rates surged in the 1980s, caps on bank deposit interest payments (Regulation Q) triggered the emergence of substitutes to bank deposits and put depository institutions at a disadvantage relative to other financial institutions, which offered attractive savings products to households and competitive funding solutions. In the 1970s, the development of pension funds had a positive impact on the capital market depth and liquidity and contributed to lengthening of the average maturity of savings.

Second, we explain how housing policies enacted after the Great Depression and throughout the 1960s-1980s significantly contributed to the transformation in the financing model of the US economy. Indeed, disintermediation significantly accelerated over the course of the 1980s with the takeoff in securitization of loans. Securitization was strongly supported by the introduction of federal guarantees in the secondary mortgage market. The creation of GSEs planted the seeds for linking mortgage markets with broader capital markets. The GSE's role was to create a strong secondary mortgage market for housing loans in order to provide a stable source of funding for residential mortgages across the country, particularly for low- and moderate-income households. GSEs helped the practice of securitization to gain prominence throughout the 1980s and allowed the transition of the financing model of the US economy from an "originate to hold" model to an "originate to distribute" model.

Finally, specific to the US, some factors allowed US capital markets to attract funds. Notably, the demand for long-term savings on the part of American households and foreign investors' demand for US long-term debt securities such as Treasuries or Agency mortgage-backed securities further accommodated the process of disintermediation. Thus, the growing role of the US dollar as an international reserve currency and the confidence of investors that the United States government will always honor its debt contributed to the development of financial markets in the US.

## The financial regulations designed in the 1930-40s created the necessary conditions for the development of a market-based financial system

The Glass-Steagall Act (GSA) of 1933 was passed by Congress in reaction to the collapse of a large portion of the American commercial banking system after the 1929 market crash. The Act established the Federal Deposit Insurance Corporation (FDIC), which was designed to guarantee the safety of a depositor's accounts and to put an end to bank runs. A separate provision of the GSA - Regulation Q - prohibited the payment of interest on demand deposits and imposed interest rate ceilings on various other types of bank deposits, including savings and time deposits. Over time, Regulation Q made bank deposits less attractive relative to other savings products and helped boost fund industry growth, particularly, money market mutual funds. The same Act separated commercial from investment banking. Deposit-taking entities were no longer allowed to underwrite, invest or trade in securities, with the exception of underwriting government-issued bonds. The repeal of the part of the GSA that prohibited affiliations among banking companies, securities companies and insurance companies in 1999 boosted corporate bond issuance.

*Regulation Q triggered the development of substitutes to bank deposits*

*Arguments used to justify deposit interest rate ceilings*

Three main arguments were used to justify Regulation Q requirements (Gilbert, 1986). One objective was to shield bank profits by limiting the competition for deposits. Congress felt that competition for deposits not only reduced bank profits by raising interest expenses, but also could have caused banks to seek riskier investments and make high risk loans in order to cover the costs. A second objective of interest rate ceilings on deposits was to encourage country banks to lend more in their local communities rather than hold balances with larger banks in financial centers. A final argument was that the deposit interest rate ceiling would compensate



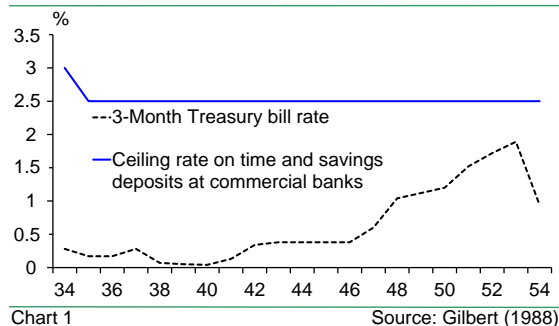
banks for the costs incurred by the newly introduced deposit insurance premiums. Interest rate ceilings were first imposed on commercial banks in the mid-1930s. The ceilings were extended to thrift institutions, such as mutual savings banks, savings and loan associations in 1966 as policymakers believed the competition for deposits between commercial banks and thrifts as one of the reasons of the rise in residential mortgage interest rates and the subsequent slowdown in lending growth.

### *Rising competition for household savings*

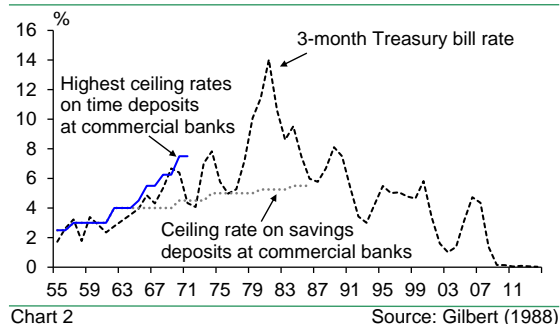
During the first 30 years under Regulation Q ceiling rates on time and savings deposits were sufficiently high to put no effective constraint on the interest rates paid by most commercial banks (Chart 1). However, market rates started to rise from the 1960s<sup>4</sup>. 1966 marks the year when for the first time market rates jumped above the ceilings rates for at least some categories of bank deposits (Chart 2). The regulators increased the ceilings in the period between 1955 to 1986 several times, but market rates continued to exceed what commercial banks and thrifts were allowed to pay on interest bearing deposits, making them less attractive for depositors. In the high interest rate environment of the 1970-80s, Regulation Q yielded significant unintended consequences. Indeed, sharp increases in interest rates in late 1979 and early 1980 induced outflows of small-denomination deposits<sup>5</sup> from commercial banks and thrifts into higher yielding money market mutual funds (MMFs). MMFs were not subject to reserve requirements or Regulation Q ceilings and became a very attractive cash-management alternative to bank deposits. MMFs grew dramatically in the late 1970s when the Federal Reserve's tight monetary policy pushed the money market interest rates as much as 10 percentage points above ceiling rates (DeYoung, 2009). In this period, flow of household funds out of bank deposit accounts into MMFs surged (Chart 3).

Finally, Regulation Q failed to achieve its stated goals of restraining competition for deposits or increasing the supply of mortgage loans. Instead, it triggered the development of bank deposit substitutes like money market deposit accounts. This contributed to disintermediation of savings. In the same vein, the Eurodollar market (bank deposits denominated in US

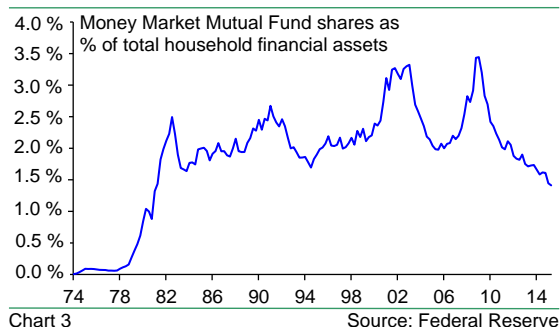
### **Interest rates and the Reg. Q ceilings from 1934 to 1954**



### **Interest rates rose above the Reg. Q ceilings from the 1970s**



### **Funds flowed out of bank deposits into MMFs**

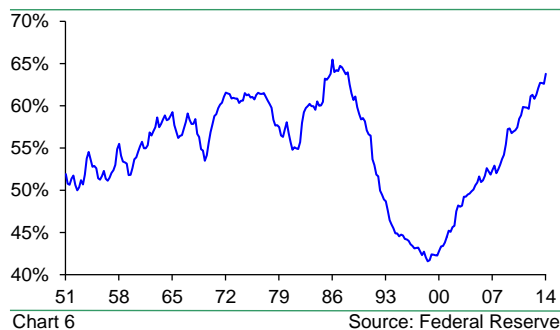


dollars located outside the United States) initially grew up largely as a means of avoiding the regulatory costs involved in dollar-denominated financial

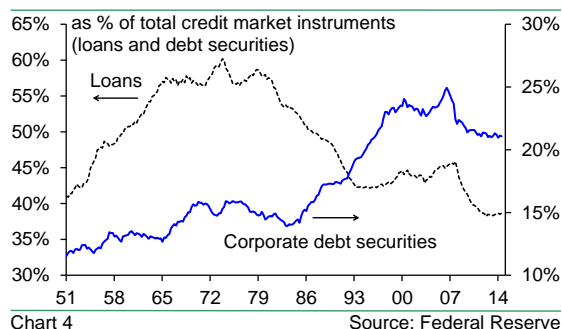


intermediation, such as Regulation Q, deposit insurance fees, reserve requirements (He and McCauley, 2012). Larger banks were in a better position to bypass these regulations through the Eurodollar market and to offer non-deposit alternatives to their depositors while smaller banks' lending growth was more constrained (Koch, 2014). With the change in the financing model of the economy (Chart 4) (see below) and the growing sophistication in off bank balance sheet savings products (Chart 5), bank deposits dropped to just 40 percent of GDP in 2000 from around 65% in the mid-1980s (Chart 6)<sup>6</sup>.

### Deposits as a % of GDP



### The rise in market-based finance



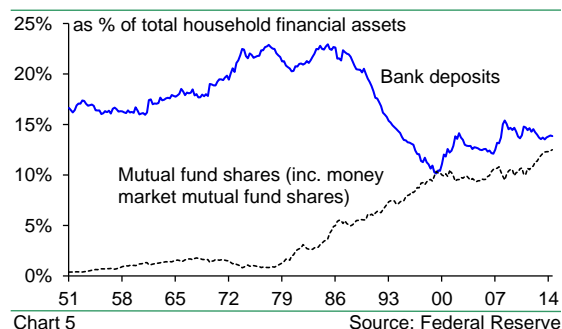
These unintended effects forced the Federal Reserve to loosen and eventually remove entirely the interest rate restrictions imposed by Reg. Q. Ceilings for savings accounts and time deposits were gradually phased out during the period 1981-1986. As of March 31, 1986, all caps on deposit interest payments had been eliminated except for the ban on demand deposit interest, which was then the only remaining substantive component of Reg. Q. The prohibition of interest-bearing demand deposit accounts was effectively repealed by the Dodd-Frank Act of 2010. Beginning July 21, 2011, banks have been allowed, but not required, to offer interest-bearing demand deposits.

Market regulation contributed to a lengthening of the maturity of household savings

### Stable framework for US capital markets

In order to restore confidence in the markets following the Great Depression Congress passed a series of key regulatory acts that shaped the US primary markets (Securities Act of 1933), the secondary markets (Securities and Exchange Act of 1934) and the regulatory regime of the fund industry (the Investment Company Act of 1940 and the Investment Advisor Act of 1940). This legislature, that underwent very limited adjustments until today, shaped a stable and sustainable backbone of US capital markets and a strong asset management industry, contributing to the process of banking disintermediation.

### Change in the structure of household savings



## *US pension system forces households to invest into long-term securities*

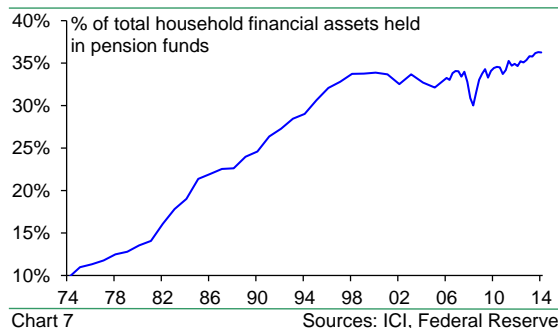
The soundness of the US capital markets also helped define the current shape of the US pension system which was built in the 1940-50s. The movement for pension reform gained some momentum when the Studebaker Corporation, an automobile manufacturer, closed its plant in 1963. Its pension plan was so poorly funded that Studebaker could not afford to provide all employees with their pensions. After years of investigation and several bills introduced to Congress, the Employee Retirement Income Security Act of 1974 (ERISA) was enacted. ERISA does not require employers to establish pension plans. Likewise, as a general rule, it does not require that plans provide a minimum level of benefits. Instead, it regulates the operation of a pension plan once it has been established by requiring the plans to meet certain minimum standards. The legislature helped restore public trust in the pension system.

Today, retirement assets make up around 35% of total household financial assets (Chart 7). Private sector pension plans and individual retirement plans make up the majority of total retirement market assets (around 70%), with federal, state and local pension plans share standing at just around 20%. Life insurance companies annuities account for the remaining 10% share. In the US, retirement plans are classified as either defined benefit plans (DB) or defined contribution plans (DC), depending on how benefits are determined.

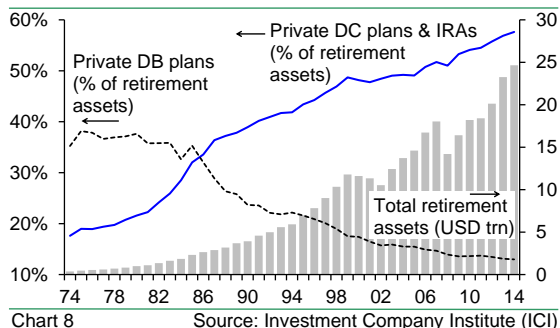
In a defined benefit (or pension) plan, benefits are calculated using a fixed formula that typically factors in final pay and service with an employer, and payments are made from a trust fund specifically dedicated to the plan. Because under the DB plan, companies were responsible for delivering a set pension amount to their employees during their retirement, the entirety of the investment risk fell squarely with the firm. While companies still service the old DB plans, they discontinued offering new DB plans. The share of private DB plans fell below 15% of household retirement assets as of late.

By contrast, in a defined contribution plan, each participant has an account, and the benefit for the participant is dependent upon both the amount of money contributed into the account and the performance of the investments purchased with the funds contributed to the account. Examples of DC plans in the United States include Individual Retirement Accounts (IRAs) and 401(k) plans. In such plans, the employee is responsible, to one degree or another, for selecting the types of investments toward which the funds in the retirement plan are allocated. This may range from choosing one of a small number of pre-determined mutual funds to selecting individual stocks or other securities. IRAs and private DCs make up almost 60% of total retirement market assets (Chart 8). Since the majority of retirement assets are held in DC plans, the amount the average US retiree gets upon retirement directly depends on how their assets are invested over time.

### **Pensions role in financial wealth**



### **DC plans make a bulk of retirement assets**





More generally, the development of pension funds had a positive impact on the capital market depth and liquidity and contributed to lengthening of the average maturity of savings (see Part 3.1). The need to maximize the return on pension assets and the combination of bull markets and product innovations in the 1980s and 1990s supported the continuing growth of the fund industry until today. According to the Investment Company Institute (ICI), the US investment companies<sup>7</sup> represented USD 18.2 trillion in total net assets at year-end 2014, holding 30% of US corporate equity, 26% of US municipal securities, 46% of commercial paper and 11% of US government securities. Among them, mutual funds managed 48% of household IRA assets (55% of other DC plans).

### *A progressive reduction in corporates' dependence on banks for funding needs*

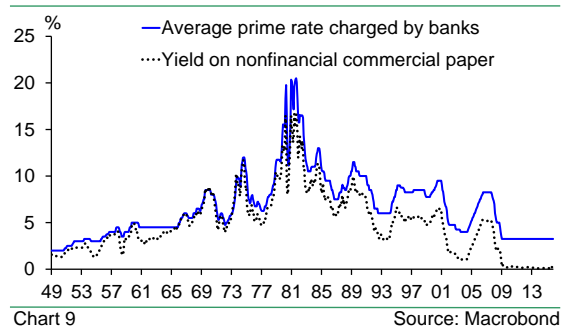
Competition from markets came very early. As early as the 1920s, the development of debt markets provided nonfinancial corporations with alternative funding sources to bank loans (Peach, 1941; Carosso, 1970). In the high interest rate environment of the 1960-70s, search for yield on the investor's part and companies' need for less expensive financing contributed to a rise in market-based intermediation with the development of commercial paper, corporate bonds and junk bonds.

### *Commercial and Industrial loans became less attractive than commercial paper and corporate bonds*

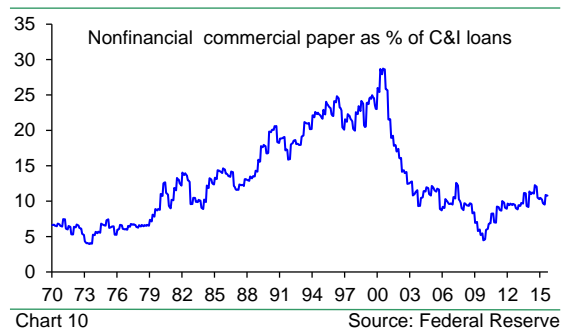
The increase in interest rates above Regulation Q ceilings in the late 1970s contributed to large outflow of funds from bank deposits (see Part 1.1) and made it difficult for banks to raise funds to meet the strong corporate loan demand existing at that time. The outflows of funds from bank deposits and the regulatory costs, such as reserve requirements and FDIC fees, hampered banks' ability to offer competitive rates to corporates. Finally, reliance on open market funds offered the potential for substantial savings to corporate borrowers compared to the cost of bank credit (Chart 9). Banks encouraged their financially strongest customers to issue commercial paper<sup>8</sup> and offered back-up lines of credit. Many potential commercial paper borrowers who formerly relied exclusively on bank short-term credit now turned to the commercial paper market (Abken, 1981;

Weelock, 1993). Brokerage firms and other financial institutions began to create money market mutual funds, which pooled small investors' funds to purchase commercial paper (Sherman, 2009). As nonfinancial firms acquired familiarity with open market finance during the 1970s, they gradually reduced their reliance on short-term bank loans. The ratio of nonfinancial commercial paper to commercial and industrial (C&I) loans at commercial banks, rose from about 7 percent in the mid-1970s to almost 15 percent in 1982, the ratio peaked in 2000 (Chart 10).

### **Commercial paper - a cheaper alternative**



### **Commercial paper share kept rising through 2000**



### *Junk bonds provide an even cheaper source of financing for fast-growing companies*

Before 1980, very few junk bonds were issued. Once information costs were reduced, the high yield bond market really opened up. Initially, the public junk bond



market consisted almost entirely of “fallen angels,” or bonds whose initial investment grade ratings were subsequently lowered. The market began to change in 1977, when bonds that were rated below investment grade from the start were first issued in significant quantities (Taggart, 1987; Altman, 2006). Investors’ search for higher-yielding securities had enhanced interest in lower-grade bonds, so new issues offered a way to satisfy this demand. At the same time, the changing industrial structure was stimulating the growth of a number of medium-sized firms whose lack of credit history prevented them from qualifying for investment grade bond ratings. Junk bonds afforded such firms direct access to investors and thus provided a potentially lower-cost alternative to borrowing through financial intermediaries. Junk bonds as a share of corporate bonds outstanding grew above 10% in the late 1980s from just around 2% in the late 1970s (Chart 11).

#### High yield bond market really opened up in the 1980s

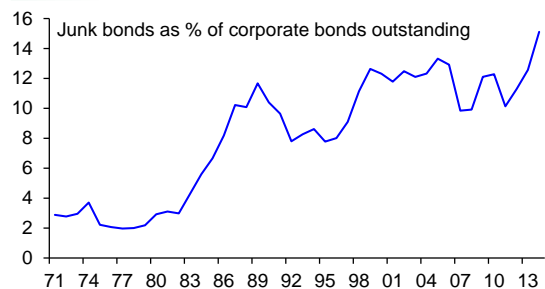


Chart 11

Source: Macrobond

#### The adjustments to the Glass-Steagall Act supported corporate bond markets

By the end of the 1970s, technological change and rapidly evolving conditions in financial markets had made the Glass-Steagall Act untenable. Portions of the old regime were dismantled. In 1987 the Federal Reserve allowed commercial bank holding companies to operate “Section 20” subsidiaries to underwrite corporate securities in limited amounts, and in 1989 began relaxing restrictions in the GSA that had banned commercial banks from underwriting corporate securities. Corporate bonds<sup>9</sup> posted double-digit growth

in the late 1980s. The passage of the Graham-Leach-Bliley Act in 1999, which repealed the part of the GSA of 1933 that prohibited affiliations among banking companies, securities companies and insurance companies, boosted corporate bond growth further as banks were now allowed to underwrite corporate debt (Chart 12). The repeal of the last provisions of the GSA also allowed for the emergence of broad banking (Barth, Brumbaugh and Wilcox, 2000). The Sarbanes-Oxley Act of 2002, that was enacted as a reaction to a number of major corporate and accounting scandals, including Enron and Worldcom, helped restore investors’ confidence in corporate financial statements further supporting the corporate bond market.

#### Corporate bonds issuance rising for decades before the crisis

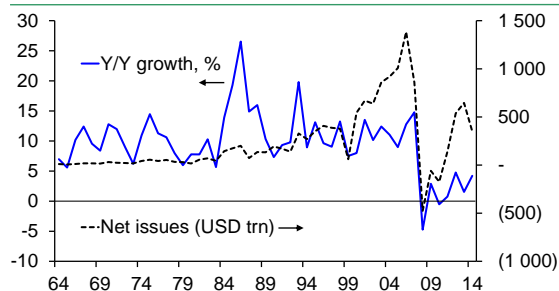


Chart 12

Source: Federal Reserve

#### Capital markets financing started to prevail in the late 1990s

The structure of the corporate debt (loans versus debt securities, including commercial paper and corporate bonds) remained relatively stable from the 1950s to the beginning of the 1990s. In the late 1990s-early 2000s the corporate share of debt securities financing rose sharply to around 60% of total debt liabilities and reached 68% in recent years. The share of debt securities financing rose at the expense of the share of loans which fell during this period (Chart 13). Even though there has been greater demand for market financing than loans on both sides of the Atlantic since 2010, in June 2015, the share of debt in the form of securities was still five times higher in the United States (68% against 14% in the euro area) (Charts 14&15) (see





Box 1 for the details on the different accounting treatment of US vs euro area non-financial business). In the US, this increase in market financing was coupled with a decrease in the share of loans carried on bank balance sheets. While around 70% of loans from financial institutions to non-financial corporates were reported on bank balance sheets in the beginning of the 1980s, this share progressively declined in the following years (in favor of finance companies, mutual funds and ABS issuers). Now, less than 50% of corporate loans are carried on bank balance sheets, so that bank loans account for only 15% of corporate debt (Chart 16).

### Debt securities make the bulk of corporates debt

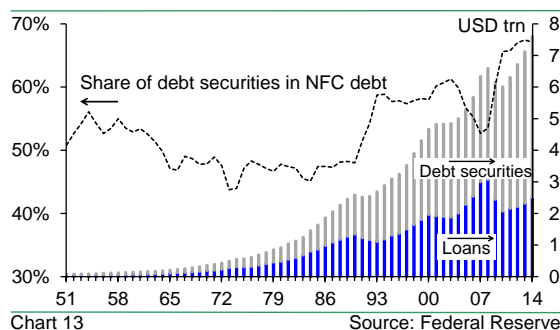


Chart 13

Source: Federal Reserve

### Breakdown of NFC debt in the US (Q2 2015)

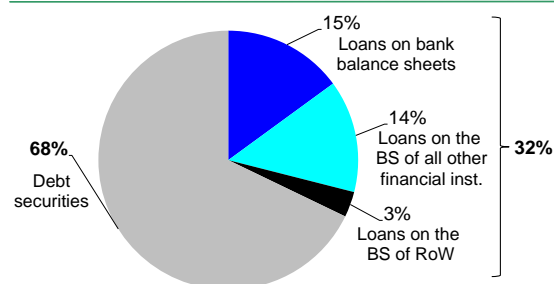


Chart 14

Sources: Federal Reserve, BNP Paribas

### Breakdown of NFC debt in the Euro area (Q2 2015)

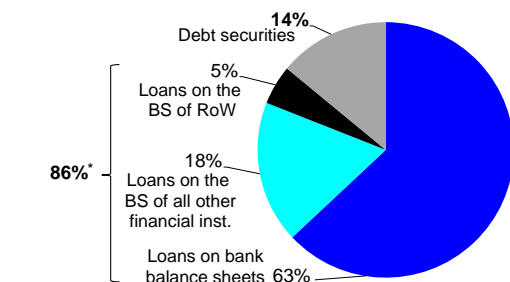


Chart 15

Sources: ECB, BNP Paribas

\* The split between holders is supposed unchanged since Q1 2014 (last available breakdown)

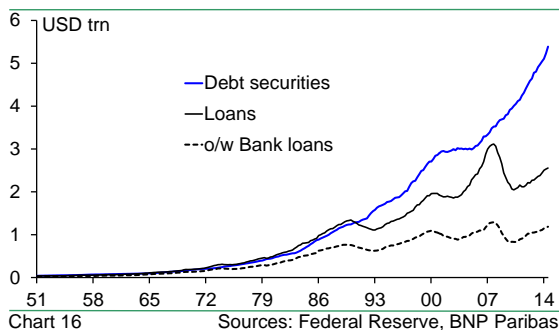
## Box 1. Treatment of non-financial noncorporate business under US vs euro area accounting rules

In the Flow of Funds Accounts of the United States, the Federal Reserve provides separate balance sheet data for the households and nonprofit organizations sector (L.101) and the nonfinancial business sector (L.102). The nonfinancial business sector is the sum of two sub-sectors: the nonfinancial corporate business sector (L.103) and the nonfinancial noncorporate business sector (L.104). The nonfinancial corporate business sector consists of all private for-profit domestic nonfinancial corporations while the nonfinancial noncorporate business sector consists of partnerships and limited liability companies, sole proprietorships and individuals who receive rental income.

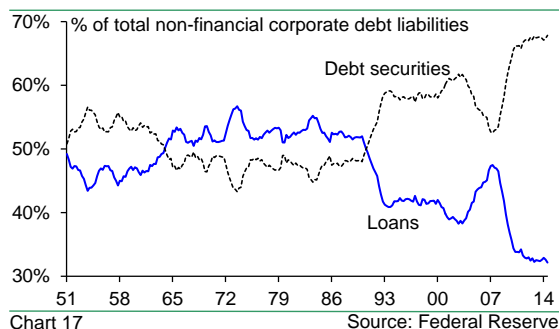
In the European Central Bank's statistics, in accordance with the methodological framework of the European System of Accounts 2010, the households sector (S14-S15) consists of households and non-profit institutions serving households (NPISHs) but also includes household firms. These cover sole proprietorships and most partnerships that do not have an independent legal status. Thus, contrary to US data, the common practice in Europe is to aggregate households and the self-employed in one group. The nonfinancial corporations sector (S11) includes all corporate enterprises.

In order to provide comparable figures on the non-financial corporates' debt structure, in this note, we only refer to the nonfinancial corporate business sector in the US (L.103) (Chart 17). As nonfinancial noncorporates generally do not have access to capital markets, this methodological choice overstates the importance of bond financing to the nonfinancial business sector as a whole. If we consider all the "nonfinancial business" and add nonfinancial corporate loans and noncorporate business loans together, then total loans amount rises to 57% of total debt (Chart 18) against 32% if we only consider corporates. This figure is very close to the share of loans in total debt of French nonfinancial corporates (61.1%). Yet, in reality, the disintermediation of financing for French corporates has not reached the same stage.

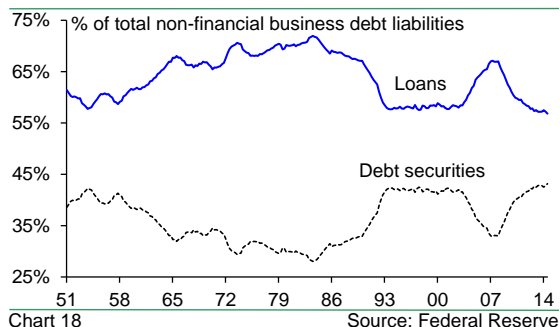
### Less than 50% of loans to NFC are carried on bank balance sheets



### Corporates mainly rely on capital markets



### Non-financial business as a whole relies less on debt securities



## The rise of securitization, in the 1980s, was strongly supported by the introduction of federal guarantees in the mortgage market

The US housing policy and particularly the introduction of federal guarantees in mortgages markets helped transform the funding structure of the US economy. The creation of GSEs planted the seeds for linking mortgage markets with broader capital markets. The GSE's role was to create a strong secondary mortgage market for housing loans in order to provide a stable source of funding for residential mortgages across the country, particularly for low- and moderate-income households. The development of securitization and asset management techniques in the 1980s helped the 'originate to distribute' model to take hold in the US. Under this model, banks move the loans they originate off balance sheets by using securitization vehicles instead of keeping these loans on the balance sheets.

### Securitization has roots in the history of the US housing market

#### *The rationale of securitization*

Traditional bank lending has four functions: originating, funding, servicing, and monitoring. Originating means making the loan, funding implies that the loan is held on the balance sheet, servicing means collecting the payments of interest and principal, monitoring means managing the risk profile of loan portfolios. Securitization allows to transform pools of immobile, illiquid assets (as mortgage loans) into tradable securities, such as mortgage-backed securities (MBS<sup>10</sup>). Banks no longer hold the loans they originate on balance sheets. Instead, they sell them off to a securitization vehicle (Rosen, 2007). The rise of securitization in the 1980s matched very well with the US regulatory agenda, as the leverage ratio began to constrain growth in banks' balance sheets<sup>11</sup>. At a time when money market mutual funds and junk bonds issuance expanded, securitization developed as an efficient and cheaper way to fund bank loans. The emergence of a new class of interest-bearing securities drew more funds out of bank deposits. Those new securities offered a more attractive return and were better tailored for specific investor needs. It became an important source of collateral for repurchase agreements or for derivatives positions in particular (Gorton, 2010).

### *The transformation of the housing finance system*

The roots of securitization go back to housing regulation of the 1930s to the 1980s and to the cultural importance of homeownership in the United States. The post-war time period of growth of the 'middle class' in America is particularly important in this respect. The New Deal policies passed during the Great Depression framed the US housing market. Before this time the federal government did not intervene in housing. The large

majority of mortgage loans were on a short-term, renewable basis, frequently involving high interest rates and were retained on banks' balance sheets. But the Great Depression hurt the housing market so badly that the government decided to help revitalizing it and boost home ownership through several pieces of legislation. These reforms set the stage for a new institutional framework shifting the role of lenders and granting a key role to federal guarantees (see Box 2).

#### **Box 2: After the Great Depression, housing policies shaped a new housing finance system**

Several pieces of legislation, aiming to provide a stable source of funding for residential mortgages and boost home ownership, have progressively transformed the housing finance system and promoted the role of federal guarantees in the secondary mortgage market:

- The Federal Home Loan Bank Act of 1932 created the FHLBank System. This system was designed to serve as a reserve credit system to support housing and provide relief to troubled homeowners and lending institutions. It established twelve regional Federal Home Loan Banks. It also provided the FHLBanks with authority to borrow up to USD 215 million from the US Treasury and to issue tax-free bonds as a source of loan funds (known as "advances") for the benefit of member institutions (savings and loan associations, cooperative banks, insurance companies);

- The Home Owners Loan Act of 1933 established the Home Owners Loan Corporation (HOLC). It was capitalized with USD 200 million in treasury funds and allowed to issue bonds up to USD 2 billion to finance operations for three years. The HOLC was authorized to refinance the mortgages of home owners threatened with foreclosure and to make cash advances to pay taxes and to fund necessary housing repairs;

- The National Housing Act of 1934 established the Federal Housing Administration (FHA). Through the FHA, the federal government began to insure mortgages issued by qualified lenders, providing mortgage lenders protection from default. If a borrower failed to make a payment, the FHA was required to cover the unpaid balance. This was financed through insurance premiums, fees, and interests on invested reserves. FHA also expanded the use of fixed-rate, longer-term mortgages;

- The Housing Act of 1937 created the United States Housing Authority to control the subsidies to be paid by the US government to local public housing agencies (LHAs) to improve living conditions for low-income families;

- The Federal National Mortgage Association (FNMA or "Fannie Mae") was created in 1938 as an amendment to the 1934 Act. Originally, Fannie Mae was a federal government agency. Its mandate was to act as a secondary mortgage market facility that could purchase, hold and sell FHA-insured loans. Through its operations, Fannie Mae created liquidity in the mortgage market, providing lenders with cash to fund new home loans. One of the objectives was to raise levels of home ownership and the availability of affordable housing. The mortgage market remained relatively unchanged following the creation of Fannie Mae until 1944, when was created the Veterans Administration (VA) mortgage insurance program. Fannie Mae began to purchase VA-guaranteed loans in 1948 and its business grew rapidly;

- The Federal National Mortgage Association Charter Act of 1954 transformed Fannie Mae from a government agency into a public-private, mixed ownership corporation;

- It was not until 1968, however, in response to the need to further broaden the funds base available for mortgages that the housing finance system began to resemble its current form. The Housing and Urban Development Act was enacted in 1968 to help low- and moderate-income families to gain further access to home ownerships. Congress established the Government National Mortgage Association (GNMA or "Ginnie Mae") as a government owned corporation, a structure it retains to this day, and privatized "Fannie Mae" which role became to purchase and retain "conventional conforming loans"<sup>12</sup>;

- Through the Emergency Home Finance Act of 1970, Congress established the Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"), to help savings and loan associations manage the challenges associated with interest rate risk. The FHLBanks originally capitalized Freddie Mac with a USD 100 million contribution. Freddie Mac issued the first conventional loan mortgage-backed security (MBS) in 1971.

- Between 1966 and 1982, inflation and the Federal Reserve's efforts to fight it, drove mortgage rates to unprecedented heights. In a step to deal with its high exposition to interest rate risk (its business activities were focused on purchasing mortgage loans and holding them in its portfolio), Fannie Mae initiated in 1981 a program to issue MBS similar to the program Freddie Mac had already established.

- In 1982, the Commission on housing estimated that the economy "could no longer rely so completely on a system of highly regulated and specialized mortgage investors and a single type of mortgage instrument". It called for a new legal and regulatory structure and a broader-based housing finance system. It set the stage for an expansion of Freddie Mac's and Fannie Mae's activities in the mortgage-backed securities area.

- In 1989, Freddie Mac's corporate structure was reorganized to one similar to Fannie Mae's: a for-profit corporation owned by private shareholders rather than by the FHLBanks.

Sources: Colton (2002), BNP Paribas

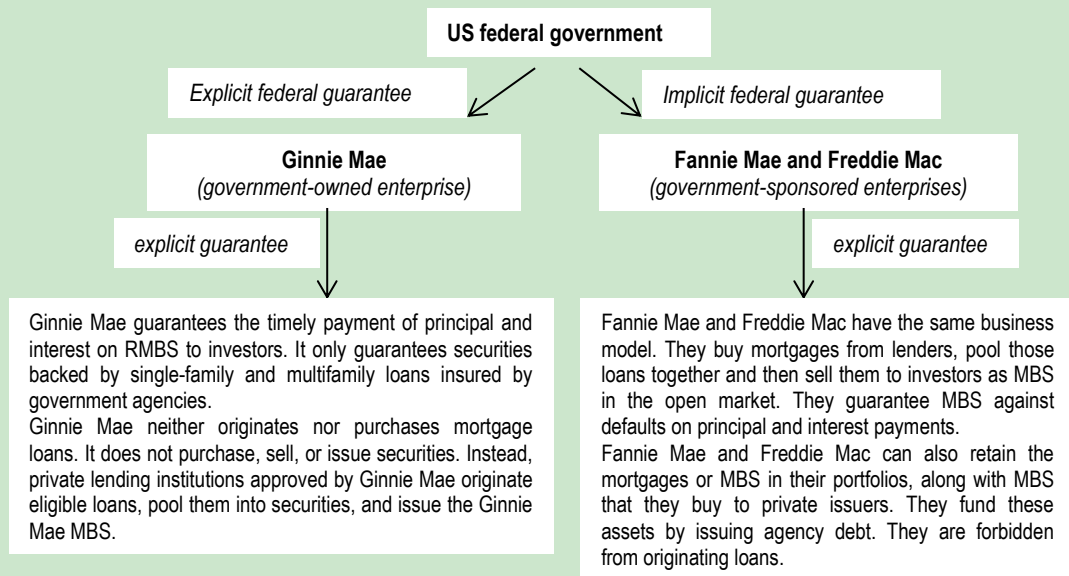
## Federal guarantees were a game changer

Securitization industry was born in the 1970s with the issuance of "pass-through" securities<sup>13</sup> or MBS by Ginnie Mae (1970), Freddie Mac (1971) and Fannie Mae (1981). Legislation played a key role in the growth of the secondary mortgage market, particularly through the activities of Fannie Mae and Freddie Mac, which grew remarkably from the 1980s. Innovative securities structures broadened the investor base, allowing more funds to move from securities markets into mortgage markets and reducing mortgage rates for home buyers.

## The business model of the Government Sponsored Enterprises (GSEs)

"Ginnie Mae", "Fannie Mae" and "Freddie Mac" as we know them today were set-up in the 1960s (see Box 2). Ginnie Mae is the only "government-owned enterprise" (benefiting explicit guarantee from the US federal government), while Fannie Mae and Freddie Mac are "government-sponsored enterprises" (GSEs), which are federally chartered corporations, but still privately owned by shareholders (without explicit guarantee from the US federal government even if they are considered de facto or "effective" beneficiaries of a federal guarantee after the US government rescued them from insolvency in 2008) (see Schema).

### Schema. Explicit vs implicit federal guarantees ("effective" after the US government placed the two GSEs under conservatorship)



For a fee, Ginnie Mae guarantees timely payment of principal and interest on mortgage-backed securities (MBS) collateralized by federally insured or guaranteed loans (mainly loans insured by the FHA or the VA). Ginnie Mae MBS do not expose investors to any credit risk, as it is covered by the explicit agency guarantee, or any counterparty risk, as the issuer default risk is covered by Ginnie Mae. By guaranteeing the servicing performance of the issuer – not the underlying collateral – Ginnie Mae protects itself from the credit risk of the mortgage loans. Ginnie Mae securities are the only MBS to carry the full faith and credit guaranty of the US government.

As government-sponsored private corporations (government-sponsored enterprises, GSEs), Fannie Mae and Freddie Mac are limited to operating in the secondary “conforming conventional” mortgage market. They can neither lend money directly to households in the primary market, nor deal in mortgages with balances above a certain size (“conforming loan limits”). Their activities take two broad forms, a “credit guarantee” business and a “portfolio investment” business (Frame, Fuster, Tracy and Vickery, 2015). They buy conforming mortgages from banks, thrifts or mortgage banks. They can keep those loans on their own balance sheets or pool them together and issue MBS, called “agency MBS”. The two GSEs promise investors timely payments of principal and interest, even if there are defaults on the underlying loans. In return of this guarantee, they receive a periodic fee, an insurance premium coming out of borrower’s interest payment. They can also retain or buy agency MBS and non-agency MBS. They fund these purchases by issuing “agency debt”.

*GSEs and private issuers: Crowding-out or knock-on effect?*

The GSEs’ debt securities and MBS have never benefited from the full faith and credit guaranty of the federal government. Nevertheless, before the financial crisis, most investors generally assumed that the government would not allow Fannie Mae and Freddie Mac to default on their obligations<sup>14</sup>. That perception of an implicit federal guarantee stemmed from the legal status of government-sponsored enterprises rather than

as fully private entities; from two past episodes in which federal government assisted trouble government-sponsored enterprises (US GAO, 1990); by the inclusion of their securities in the “agency” market along with securities that had explicit federal backing. It was reinforced by the specific benefits that the two entities received that result in lower operating and funding costs. They did not have to register their securities with the Securities Exchange Commission; they were exempt from state and local corporate income taxes; they had a line of credit with the Treasury; they were required to hold very little capital to protect against losses. This allowed the two GSEs to become key players in the secondary market for mortgage loans.

The perception of a federal guarantee enabled the two entities to borrow in the capital markets at significantly low interest rates. It also caused investors to place a higher value on MBSs guaranteed by the GSEs than on MBSs guaranteed by private mortgage insurers and allowed the enterprises to charge lower guarantee fees compared to those charged by private companies. As a result, Fannie Mae and Freddie Mac have been able over the decades to issue debt and MBS at lower yields than their stand-alone financial strength ratings would otherwise warrant, by 20 to 40 basis point (Nothaft, Pearce and Stevanovic, 2002; Ambrose and Warga, 2002, Passmore, 2005). This funding advantage was partially passed on to borrowers in the form of lower cost of credit. Prior to the financial crisis, conforming mortgages had lower interest rates than jumbo loans (mortgages with principal balances above the conforming loan limits), with estimates of the gap ranging from 10 to 30 basis points depending on the sample period and estimation approach (Kaufmann, 2014; DeFusco and Paciorek, 2014). Today, GSEs’ debt securities and MBS continue to benefit from sustained demand as they enjoy a favorable regulatory treatment under Basel 3 rules (in particular in the risk-weighted capital ratio and the Liquidity Coverage Ratio).

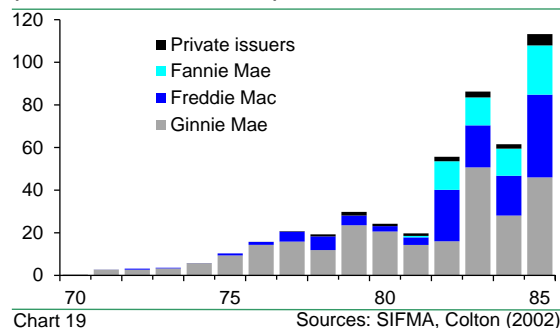
At first glance, it might appear that GSEs may have crowded out private MBS issuers (until at least 2004). However, it could also be true that federal guarantees supported growth of the private segment by indirectly funding it. Indeed, Fannie Mae and Freddie Mac bought large amounts of privately issued MBS. By the

end of 2007, they owned over USD 300 billion of non-agency MBS and funded those purchases by issuing debt securities backed by the implicit guarantee from the US federal government. The GSEs also promoted it by standardizing the securitization process (CBO, 2014).

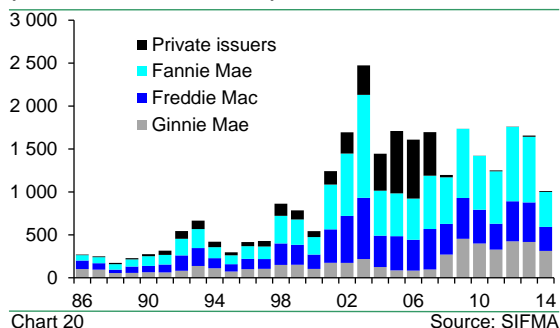
*Private-label securitization deals emerged in the late 1970s.*

Over the course of the 1980s, a favorable legal, tax and accounting securitization framework was shaped. This framework supported growth of private-label securitizations (securities issued and insured by private companies without government backing). Private securitization covered mortgage-related and consumer loans such as credit cards, auto loans, student loans, home equity loans etc. While government agencies and government-sponsored enterprises (GSEs) provided a bulk of housing financing in the late 1990s - early 2000s (80% until 2003), private securitization grew rapidly between 2004 and 2006. Private-label residential MBS (RMBS) issuance in the United States increased from USD 27 million in 1976 to USD 69 billion in 2000 and USD 686 billion in 2006, making up 43% of RMBS and 26% of total mortgage-related issuance in 2006 (see Charts 19 & 20). The share of all types of private mortgage-related securities, such as RMBS, CMBS<sup>15</sup>, CMO<sup>16</sup>, home equity and manufactured housing, increased from 18% in 1996 to 52% in 2006 (Chart 21).

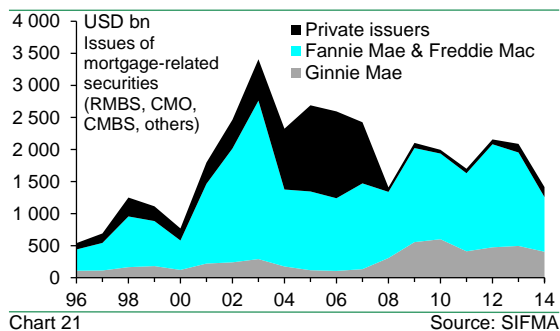
### The beginnings of securitization in the US (RMBS issuance, USD bn)



### Private issuance surged in the 2000s (RMBS issuance, USD bn)



### Private Mortgage Securities issuance almost vanished since 2008



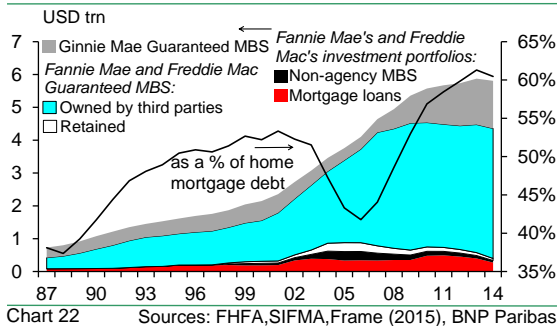
Agencies lost their market share between 2004 and 2006 as a result of the limits set on GSEs' portfolio growth and the rise in large and/or risky home loans that did not meet GSE's eligibility criteria. Private issuance growth was associated with a decline in lending standards over the period (CBO, 2010; FHFA, 2010). The financial crisis interrupted this trend. While private-label securitization collapsed in the wake of the crisis, agency-related issuance remained firm as the two GSEs were rescued from insolvency by the US government and placed under the conservatorship of the Federal Housing Finance Agency (FHFA<sup>17</sup>).

As private MBS issues vanished, the secondary market is again dominated by government agencies and GSEs. In 2014, Fannie Mae and Freddie Mac owned or guaranteed 45% of home mortgage debt outstanding



(Chart 22) and about 65% of new residential mortgage loans (according to the CBO). Through its financial commitment to the two GSEs and its other mortgage programs, the federal government backed about 80% of all new residential mortgages (CBO) and 60% of home loans outstanding (Chart 22)<sup>18</sup>.

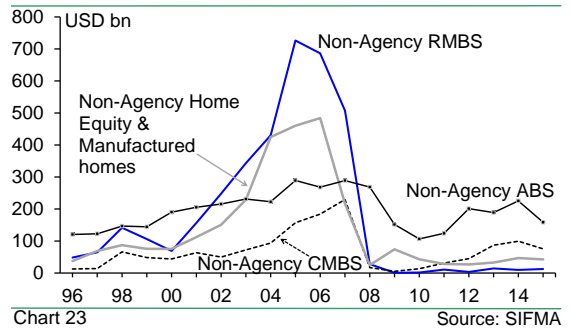
### 60% of home mortgage debt is backed by a federal guarantee



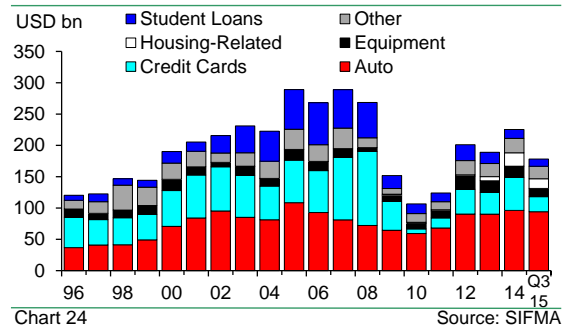
It is difficult to know whether the private-label market would have recovered quickly in the absence of the GSEs, but the crisis demonstrated how fragile a fully private secondary market would be. More than seven years later, Fannie Mae and Freddie Mac still remain in conservatorship and policymakers remain divided on what their ultimate fate should be. Even if they are considering a range of proposals to encourage a larger private role in the secondary mortgage market, the withdrawal of federal guarantees seems not to be in the agenda.

Private securitization issuance in the United States is currently running at one quarter the level observed in 2005 (Chart 23), but is slowly recovering. The recovery is supported by a modest pick-up in issuance of private asset-backed securities (ABS) and commercial mortgage-backed securities (CMBS). Strong consumer demand for cars and trucks has been a driving force behind the domestic economic recovery as consumer borrowing for autos has grown tremendously. More recently, growth in ABS has been supported by credit cards backed issuance, as strong demand for autos finally broadened to a wider range of goods and services (Chart 24). As of 2014, autos and credit cards backed issuance made up two thirds of total ABS backed issuance.

### Private issuance by type

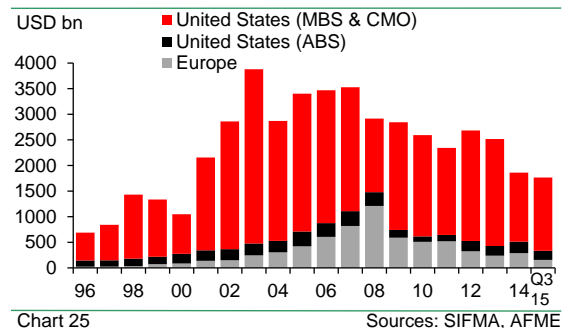


### Non-Agency ABS issuance by type



In comparison, in Europe, securitized products issuance not only contracted strongly since 2008 (Chart 25) but more than 50% of securities issued in the first three quarters of 2015 were retained on the banks' balance sheets (54.5% of outstanding in Q2 2015), presumably for repo or other secured financing.

### Securitization issuance in the US and in Europe



## The US financial system underwent an extensive transformation in the 1980s

By the end of the 1980s, the US financial system became heavily market-dominated while financial systems in continental Europe remained universally bank-dominated. The surge in securities markets and the takeoff in securitization greatly contributed to the decline in regular banking activities such as originating and holding loans on balance sheet, starting in the 1980s (Chart 26). In December 1951, American banks still held nearly 44% of financial assets, compared to only 6 % for other financial intermediaries. Other financial institutions started to play a growing role in the end of the 1970s and, after about thirty years, held 43% of financial assets in 2007 (Chart 27). Notably, US brokers-dealers' and ABS issuers' share of financial intermediation grew rapidly as financial flows progressively shifted from the balance sheets of commercial banks and savings and loans to the capital markets (Adrian and Shin, 2010). The share of financial assets held by securitization vehicles (ABS issuers and GSEs) rose from only 1% in December 1951 to 18% by the end of 2007 (Chart 28).

Since the beginning of the 2000s, bank loans account for only a third of the debt of households<sup>19</sup> and non-financial corporations (after having peaked at 55% in 1974), a share which is less than half the figure for the euro area (Chart 29). The substitution of creditors is more visible for home mortgage loans, a segment that was largely securitized. Since the 2000s, only 30% of household mortgage loans are held on US bank balance sheets<sup>20</sup>. 70% of loans outstanding were either sold to issuers of mortgage-backed securities or, to a smaller extent, originated and kept by mortgage companies (Chart 30). Although the data gathered under the Home Mortgage Disclosure Act tend to underestimate the size of the secondary market for mortgage loans<sup>21</sup>, the numbers do reveal the fact that these loans stay on the originator's balance sheet only temporarily (Bhutta, Popper and Ringo, 2015). Overall, about 80% of household mortgage loans originated in 2014 were sold during that year. Banks reported selling more than three-fourths of their originations (they accounted for over one-half of all reported mortgage originations) while

mortgage companies sold nearly all the loans they originated (they accounted for 45% of mortgage originations). Credit unions sold half of their originations.

## Transformation in the financing model of the US economy

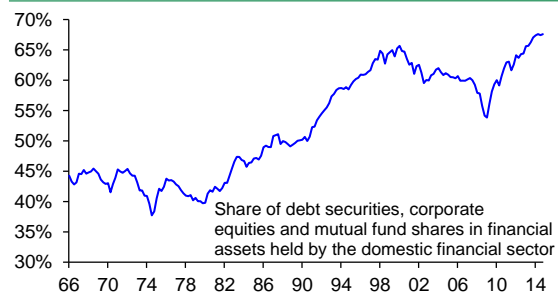


Chart 26

Source: Federal Reserve

## Weight of sub-sectors in the US financial system

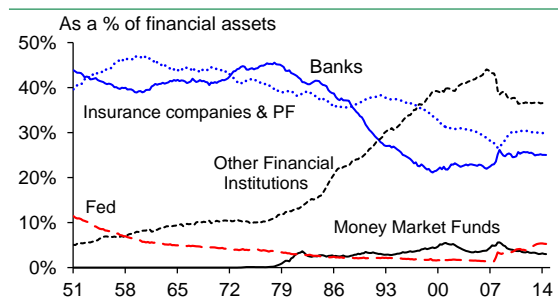


Chart 27

Source: Federal Reserve

## The growth of ABS issuers

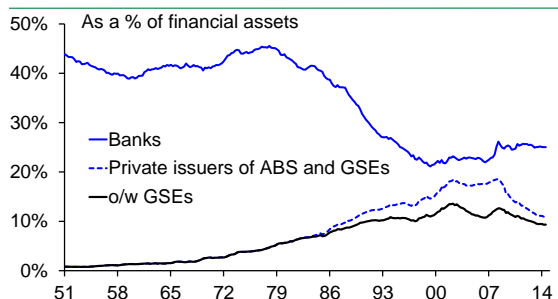
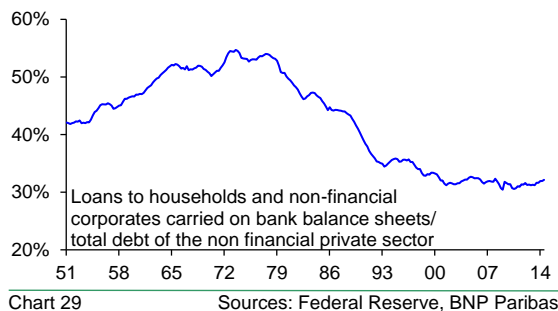


Chart 28

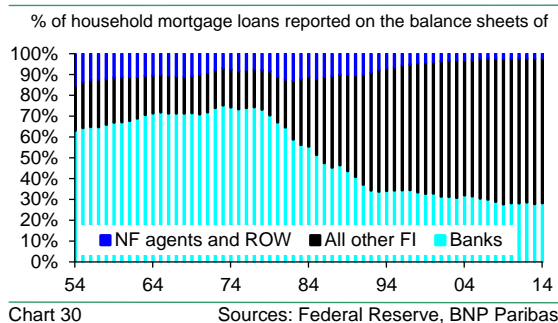
Source: Federal Reserve



## Weight of bank loans in household and NFC debt



## In the US, 70% of household mortgage loans are reported on the BS of non-banks



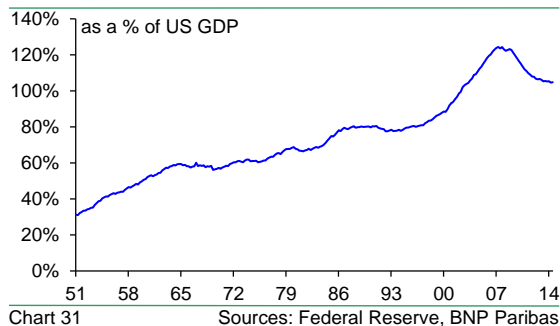
## US economy indebtiness also supported disintermediation

Beyond the regulatory and institutional framework, the size of capital markets depends on the volume of funds being channeled towards them. In this regard, the need for long-term savings on the part of American households and the foreign investors' demand for US long-term debt securities, such as Treasuries or Agency mortgage-backed securities, further accommodated the process of disintermediation. These aspects are specific to the US. The absence of these conditions in Europe may be creating a major obstacle to the development of market finance.

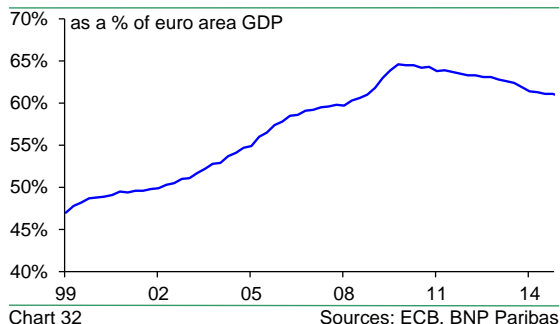
## American households are heavily in debt but they also invest more extensively in financial assets

The debt ratio of the American households rose sharply from around 70% in the beginning of the 1980s to a high point of 124% at the end of 2007 and after the crisis fell to just above 100% at the end of 2014, as the Federal Reserve easy monetary policy allowed households to refinance at lower rates and pay down some of the existing debt (Chart 31). However, at its current level of 103% of GDP, the US household debt remains significantly higher than the current average debt ratio of the households of the euro area, which stood at 61% in June 2015 (Chart 32).

## US household debt rose to a high point of 124% of GDP at the end of 2007



## Household debt stands at 61% of GDP in the euro area



American and European households not only have different levels of debt, they also differ greatly in the way they allocate their savings. This is usually explained by differences in tax rules, a lack of trust of European retail investors in financial markets, a lack of adequate financial expertise or just higher risk aversion but it can also be related to the way households deal with their liquidity constraints. While in the euro area households engage in liquid precautionary saving to smooth their outlays during the economic cycles, American households opt for short-term borrowing when they lack funds which allows them to adopt, as explained below, a longer horizon when allocating their savings. Thus, consumer credit stood at 6% of GDP in the euro area at the end of 2014 against 19% in the US.

As American households are heavily in debt, saving rates in the US remain extremely low in comparison to other countries. However, American households also invest more extensively in financial assets (saving accounts, pension or insurance contracts, direct holdings of securities or mutual fund shares ...). Financial assets held by the households currently account for 420% of GDP in the United States against 210% in the euro area. In addition, the savings of the American households are invested into long-term securities to a larger extent. In the euro area, most households either deposit their savings at a bank or invest them in real estate, or they may save via a pension or insurance contract. In the US, direct holdings of equities and mutual fund shares also account for a significant share of households' financial assets. In June 2015, 35% of the financial assets of the households in euro area consisted in deposits and shares of money market mutual funds (29% in France), against only 15% in the United States<sup>22</sup>. Conversely, the capital markets share in household financial assets was much higher in the United States (78% of the total of the financial assets of the households) than that in the euro area (62%). In the US, retirement savings and equities form the bulk of long-term savings (Charts 33 & 34).

The status of the US dollar as an international reserve currency has also supported US capital markets

The growing role of the US dollar as an international reserve currency could also have been a determining

### Breakdown of main household financial assets (Q2 2015) in the US

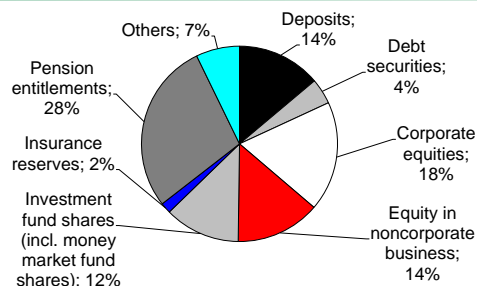


Chart 33

Sources: Federal Reserve, BNP Paribas

### Breakdown of main household financial assets (Q2 2015) in the euro area

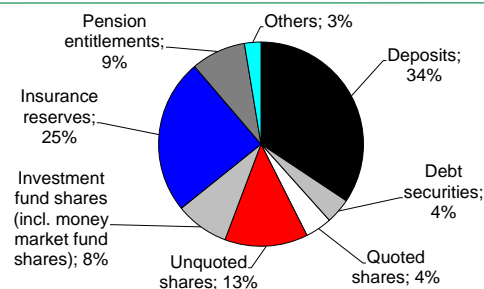


Chart 34

Sources: ECB, BNP Paribas

factor in the disintermediation process. By the early 1960s, the US dollar's fixed value against gold, under the Bretton Woods system of fixed exchange rates, was seen as overvalued. A sizable increase in domestic spending on Great Society programs and a rise in military spending caused by the Vietnam War gradually worsened the overvaluation of the dollar. As a result, investors demanded higher returns on dollar investments, thus pushing interest rates higher. By March 1968, the Gold Pool disintegrated and the seven leading central banks agreed to replace it with a two-tier system of official and private gold prices. The Bretton Woods system dissolved between 1968 and 1973. In August 1971, US President Nixon announced the suspension of the dollar's convertibility into gold and by March 1973 the major currencies began to float against each other. From the 1970s, the removal of controls on capital flows fostered the internationalization of financial markets.



The accumulation of current account deficits resulted in a negative net international investment position with respect to the rest of the world from the beginning of 1980s. The negative position regularly grew deeper as capital inflows exceeded outflows until reaching approximately 25% of GDP. These capital inflows mainly took the form of acquisitions of long term government securities (USD 5°380 bn held by non-resident investors out of the total of USD 10 675 bn on June 30th, 2014, which represents 50%). In addition, the inflows consisted of investments in private bonds (the proportion of foreign holdings stood at 25%) and securities issued or guaranteed by the US GSEs (11%) while the outgoing American capital was invested mainly in foreign equity shares. Throughout the 2000s, holding by the non-resident investors of long term US debt securities (USD 9 000 bn at the end of December 2013), whether the investments were made in Treasuries or Agencies (the net position stood at USD -5 500 bn) or private debt (USD -1 200 bn) clearly exceeded that of the US investors in foreign bonds (USD 2 300 bn). It is extremely probable that the confidence of investors that the United States government's will always honor its debt and agency debt to foreign investors left more room for US residents to invest in corporate or ABS bonds. The less constraining regulation framework of the time (low risk weight for securitizations, absence of constraints relating to size or leverage) and the search for collateral and yields could have spurred some European banks, penalized by a margin squeeze, to invest in US securitized bonds (in particular certain Irish banks or German Landesbanken). All the more as they had cheap access to US dollars funding through US money market funds. These developments boosted demand for securitized assets and further promoted banking disintermediation.



The key ingredients of banking disintermediation in the US began to form after the Great Depression and began transforming the nature of financial intermediation in the 1980s. This process took several steps, driven by a mix of regulatory, political, market and macroeconomic factors. US policy-making has provided continuous incentives to the development of a market-based financing model over time from the Glass-Steagall Act in the 1930s to the development of government agencies and GSEs in the 1970s, which benefitted from either explicit or implicit guarantees from the US federal government. Specific to the US, households and corporations' strong confidence in markets, a wider use of consumer credit that facilitates long-term savings, the US dollar's status as an international reserve currency and the accumulation of current account deficits from the beginning of the 1980s have allowed a strong development of deep and liquid capital markets with a wide variety of instruments, thereby supporting the process of banking disintermediation.

It is premature to assess the impact of the post-2008 crisis regulations on US banking disintermediation. At a first glance, the process of disintermediation is gradually resuming with investors' search for yield. Additionally, the recent post financial crisis legislature (Dodd-Frank Act and Basel III) made it more expensive for banks to fund their assets, increasing the significance of non-banking financing. In order to avoid the collapse of the US financial system in the middle of the crisis, the US federal government and the Federal Reserve stepped in to provide public "safety nets" not only for insured depository institutions but also for primary dealers, GSEs, Money Market Funds or for specific institutions (as Bear Stearns and AIG) and key credit markets (as commercial paper and asset-backed commercial paper markets). The Federal Reserve stated that no financial institution should be considered as "too big to fail" anymore and recently issued a new rule prohibiting its emergency lending programs to be used for the purpose of aiding specific companies to avoid bankruptcy or resolution. However, its pragmatism and its enforcement ability had given rise to the expectation that it would do so again if another such calamity were to occur and further supported investors' confidence in capital markets. The crisis also revealed that the dominance of



nonbanks and markets in financing the economy brought with it not only economic benefits but also risks to financial stability and urged for a more suitable monitoring and regulation of institutions and markets in the shadows.

Whatever the evolution of the regulatory framework in the coming years is, the US market-based financing model as well as the “originate to distribute” model are unlikely to change in a dramatic way. Although there is some discussion about reforming GSEs and reducing their market share, there are no concrete plans to withdraw the federal guarantees from the mortgage market, the only real measure that could call into question the American financing model.

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## NOTES

<sup>1</sup> Banking intermediation refers to the share made up by depository institutions in the overall amount of financing granted to domestic non-financial agents. Unfortunately, available data do not allow assessing this accurately (for example, we can't evaluate the placements of banks in securities issued by nonfinancial corporations or their role in the preparation and execution of fund raising on the equity and bond markets). Another problem is that equities outstanding are reported at market value. To calculate equities outstanding restated for valuation effects, it is generally recommended to proceed with an accumulation of flows starting from an initial outstanding. The size of share buybacks by US non-financial corporations and the relatively short horizon of European temporal series rule out the possibility of making this calculation over very long periods. That's why we focus our analysis solely on the financial debt of non-financial agents and on banking intermediation in the narrow sense of the term, that is on the share of loans to households and nonfinancial corporates carried on bank balance sheets. This is an imperfect measure of the share of bank intermediation since the financial liabilities of US non-financial corporations are comprised of equities (74%) (valued at market value), debt instruments (18%) and loans (8%); compared to 65%, 5% and 30%, respectively for non-financial corporations in the Eurozone.

<sup>2</sup> Debt instruments include debt securities (commercial paper, corporate and foreign bonds, Treasuries, Agency- and GSE-backed securities, municipal securities) and loans (mortgages, consumer credit, other types of depository institution loans, other loans and advances). The domestic financial sector is defined as domestic banks and nonbank financial institutions, excluding the monetary authority.

<sup>3</sup> The growth of US capital markets and the decrease in traditional banking activities might not be viewed as a decline of the banking industry. For example, the growth in underwriting or servicing fees earned by banks could mitigate some lost interest income from traditional loans. Equally, the fall in the weight of depository institutions in the financial system should not make us forget their close relationship with other financial institutions (inside a banking group or through financial contracts). Obviously, the boom in markets and financial innovation in the 1980s profoundly changed the role of credit intermediaries in the US, gumming the lines between the various players. We will not analyze relationships between banks and non-banks in this paper.

<sup>4</sup> Federal government expenditures exceeded receipts since 1969. A negative balance of payments, growing public debt incurred by the Vietnam War and Great Society programs caused the dollar to become increasingly overvalued. In 1971 more and more dollars were being printed in Washington, then being pumped overseas, to pay for government expenditure on the military and social programs. It escalated to the point where holders of the dollar started to lose faith in the ability of the U.S. to cut budget and trade deficits and demanded higher returns on dollar investments, thus pushing interest rates higher. However, most of the increase in market interest rates since the mid-1960s resulted from rising inflationary rate expectations. Inflation picked up in the late 1960s, ratcheting up from about 3% in 1966 to nearly 6% in 1971. In 1973-1974, the first of two major "oil shocks" increased the price of petroleum four-fold, dramatically raising energy costs for both consumers and businesses. Workers' wage demands outpaced the rate of productivity growth, driving up unit labor costs for businesses. The annual inflation rate spiked to over 10% in 1974 and again in each of the three years from 1979 to 1981. The origins of the Great Inflation of 1965 to 1984 are widely believed to be Federal Reserve policies that allowed for an excessive growth in the supply of money. The Great Inflation began and continued largely because monetary policymakers felt constrained to accommodate expansionary fiscal actions. More generally, monetary policymakers felt that they needed to support the administration's and Congress's desire for low unemployment above all else, allowing for expansionary monetary policy as inflation kept creeping higher. Rising inflation resulted in higher inflation expectations, in turn pushing up the level of interest rates.

<sup>5</sup> Deposits in denominations of USD 100 000 or more were made exempt from Regulation Q in June 1970. According to some studies, Regulation Q altered the allocation of wealth in the economy, causing those with relatively small savings to forego billions of dollars in interest income they might otherwise have earned (Gilbert, 1986).

<sup>6</sup> In the early 2000s, the exceptional growth in loans, sustained by the development of securitization (see Part 2), led to a huge rise in deposits. The recent financial crisis arrested investors' willingness to invest in risky assets and led to an explosion in cash deposits. From 2009, this trend was supported by the Fed's asset purchases. Indeed, through its Quantitative Easing program, the Federal Reserve mainly bought assets from nonbank financial firms (as Government Sponsored Enterprises), the households sector (inc. hedge funds and private equity funds) and foreign investors. Since most of the sellers lack deposit accounts at the Fed (except GSEs), these purchases had to be credited to the account of the sellers' clearing bank – creating reserves at the Fed on the asset side of bank balance sheets – and to the sellers' bank deposit accounts – creating bank deposits on the liability side of bank balance sheets.

<sup>7</sup> Open-end mutual funds, closed-end funds, exchange-traded funds and unit investment trusts.

<sup>8</sup> The Securities Act of 1933 requires that securities offered to the public be registered with the Securities and Exchange Commission. Registration requires extensive public disclosure, including issuing a prospectus on the offering, and is a time-consuming and expensive process. Most commercial paper is issued under Section 3(a)(3) of the 1933 Act which exempts from registration requirements short-term securities as long as they have certain characteristics (maturity, denomination ...).

<sup>9</sup> Unlike government securities, the securities of GSEs, or municipal debt securities, corporate debt securities are subject to the registration with the Securities and Exchange Commission (SEC) and reporting provisions of the Securities Act and the Exchange Act of 1933. To a great extent therefore, regulation of the initial offering of debt securities is similar – even identical – to the regulation of equity offerings. Beginning in the 1980s the fixed income market changed as hold-to-maturity investors were replaced by institutional investors who actively trade fixed income securities. The introduction of shelf registrations in SEC in 1982 gave a boost to corporate bond market development by allowing issuers to access the market on short notice. Shelf registration is a process authorized by the SEC under Rule 415 that allows a single



registration document to be filed by a company that permits the issuance of multiple securities. Before each offering and sale is actually made, the company must file just a relatively short statement regarding material changes in its business and finances since the shelf prospectus was filed.

<sup>10</sup> Mortgage backed securities (MBS) are bundles of mortgages which are packaged together as one instrument and sold like a bond. The payments from all the individual mortgages are then distributed to the holder of the mortgage backed security. MBS are secured by a mortgage, or more commonly a collection ("pool") of mortgages.

<sup>11</sup> The leverage ratio was introduced very early in certain parts of the US (dates back to the early 1900s) but it only became a constraint for all US banks from the 1980s.

<sup>12</sup> In order to be "conforming", a mortgage loan must meet certain criteria that would allow Fannie Mae and Freddie Mac to purchase the loan. The most significant of the criteria is the loan limit, which refers to the maximal amount of the loan. Other criteria include standards for debt-to-income ratios and financial documentation that must be submitted by the borrower to support the loan.

<sup>13</sup> A "pass-through" is a pool of fixed-income securities backed by a package of assets. A servicing intermediary collects the monthly payments from issuers and, after deducting a fee, remits or passes them through to the holders of the pass-through security. The most common type of pass-through is a mortgage-backed certificate, where homeowners' payments pass from the original bank through a government agency or investment bank to investors.

<sup>14</sup> In the midst of the financial crisis, the investors' perception has proved right as the government did bail out the GSEs by placing them into conservatorship.

<sup>15</sup> The mortgages of private label MBS may be residential (RMBS) or commercial (CMBS) depending on the type of loans they are backed with.

<sup>16</sup> A collateralized mortgage obligation (CMO) is a type of mortgage-backed security in which principal repayments are organized according to their maturities and into different classes based on risk. A collateralized mortgage obligation is a special purpose entity that receives the mortgage repayments and owns the mortgages it receives cash flows from (called a pool). The mortgages serve as collateral, and are organized into classes based on their risk profile. Income received from the mortgages is passed to investors based on a predetermined set of rules, and investors receive money based on the specific slice of mortgages invested in (called a tranche).

<sup>17</sup> FHFA is an independent regulatory agency responsible for the oversight of the GSEs. Its function is to ensure that the GSEs operate in a safe and sound manner so that they serve as a reliable source of liquidity and funding for housing finance and community investment.

<sup>18</sup> Based on the methodology proposed by Frame, Fuster, Tracy and Vickery (2015), we estimate that both GSEs held on their balance sheet (in plain form or as securitized loans) or had securitized and sold (with the effective guarantee of the federal government) close to 45% of outstanding home loans (around USD 4 500bn out of USD 9 900bn in total outstanding). This methodology consists in adding together 1. the stock of securities backed by home loans issued by Fannie Mae and Freddie Mac and sold to third parties, 2. the securities issued by the GSEs and retained on their balance sheet, and 3. portfolios of loans and non-agency mortgage-backed securities purchased by GSEs for investment purposes. To avoid any double-counting, cross-holdings have been excluded (MBS issued by Fannie Mae and held by Freddie Mac, and vice versa). If we also take into account Ginnie Mae securities backing non-conventional loans and non-conventional loan portfolios held for investment purposes by the two GSEs, close to 60% of outstanding home loans (around USD 6 000bn) were covered, at least to some extent, against credit risk by the federal government in 2014. This evaluation overlooks the fact that conforming conventional loans with a LTV ratio of over 80% must be supplemented with private insurance covering initial losses. Also, for all conforming loans, mechanisms for sharing credit risks with investors have been introduced recently.

<sup>19</sup> In order to provide comparable figures (see Box 1), "US households" refer in this note to the households sector and to the nonfinancial non corporate business sector (tables L.101 and L.104 in the Flow of Funds Accounts of the United States).

<sup>20</sup> Household mortgage loans are valued by weighting mortgage loans on bank assets by the weight of households (as debtors) for this type of loan.

<sup>21</sup> The HMDA data tend to underestimate the size of the secondary market: loans sold during a calendar year different from the year of origination are reported as having been kept on the originator's balance sheet.

<sup>22</sup> In the Flow of Funds, as some items on the household financial account are deduced through subtraction, household assets can include assets held by domestic hedge funds, private equity funds and personal trusts.



# How long the *Commodity Blues* will play?

Anna Dorbec

*Have commodity prices hit bottom yet? How much longer will this period of low prices last? This article will try to answer these questions from the very long-term perspective of commodity supercycles. Our analysis suggests that prices will continue to decline. Looking beyond possible cyclical rebounds, the long-term downward phase is bound to continue until a new “structural growth engine” emerges as powerful as China over the past two decades, Europe in the post-war period and the United States in the late 19th century.*

In the span of just a few quarters, commodity prices caught the markets by surprise as an abrupt drop-off was followed by a spectacular recovery and then another downturn. Some are convinced that prices have now hit bottom, although the timing and size of any rebound is still very uncertain. Others envision further declines. There is a general consensus, however, that the upward phase of the commodities cycle is now over. As the market seeks to strike a new equilibrium, it is accompanied by greater volatility.

With the new situation in the commodities market, the cards are being reshuffled for the world economy. In the net commodity exporting countries, currencies will depreciate, fiscal revenues erode and governments have to dip into the savings accumulated during the fat-cow years, and may even have to borrow to finance their deficits. The countries that enjoyed abundant savings in the bank are now looking to borrow, which changes the situation on global financial markets. Commodity exporting countries that failed to accumulate savings will face growing doubts about the sustainability of their public accounts. Their macroeconomic situation is bound to deteriorate if this period of low prices persists. On the other side of the spectrum, net commodity importing countries such as India and many of the OECD countries will benefit from the impact of low prices. The positive effects will be seen in purchasing power gains and better terms of trade, as well as in lower inflation (and even deflation in certain cases).

Whether countries must adapt public spending to meet the new situation or are able to “cash in” on the favourable pricing environment, looking beyond a simple windfall effect, one thing is clear: both groups need visibility. Yet the market is still mired in a period of uncertainty.

This raises questions about the nature of the latest downturn in commodity prices. Will it be short lived or is it a long-term phenomenon? Is the drop off in commodity prices structural or cyclical? How far can prices fall?

This paper seeks to answer some of these questions, first by looking at very long-term pricing trends, which will be reviewed in part one. We will then make a more detailed analysis of the specificities of the latest supercycle (which is still underway). The second part will focus on demand, notably the exponential growth of Chinese demand. Parts three and four will look at supply-side trends and the impact of financialization, respectively.

## Commodity supercycles

Commodity supercycles are identified when the pricing trends of several different commodities move in sync over a very long period of time (in excess to 20 years). Since these supercycles last much longer than a classic business cycle, there is a strong temptation to consider them to be permanent or sustainable trends. Upward phases are marked by



increasing fears of commodity shortages that risk cutting short economic development and growth (the peak oil theory is a very good example): these assumptions confirm current trends. Downward phases usually calm these fears. There is more talk about how commodity consumption has reached maturity, and how with the help of new technology we will be able to push back the limitation on resources, without shortages or having to pay ever-higher prices. The phase in which pricing dynamics are being studied has an influence on expectations. This is why it is important to take into account the longest trends possible.

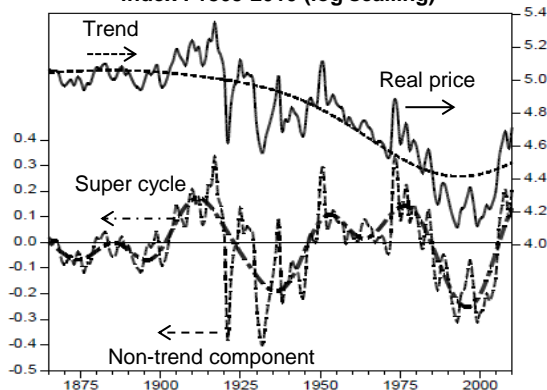
Using band-pass filters, Erten and Ocampo (2012) identified four commodity price supercycles in a study covering the 19<sup>th</sup> century to 2010. The cycles lasted between 30 and 40 years during which commodity pricing trends were recorded with deviations of 20% to 40%.

### Super long decline in agricultural and metal prices

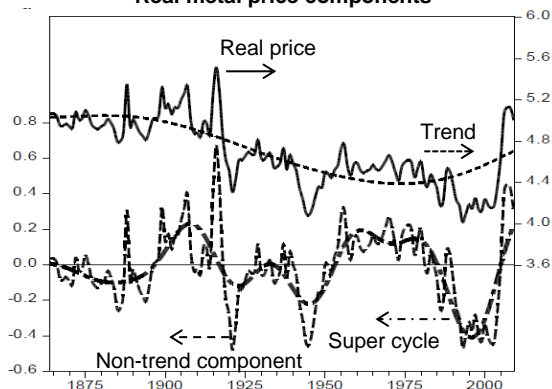
As the following charts show, there is a divergence in long-term pricing trends (i.e. real prices deflated by the price index for manufactured goods) by type of commodity. Oil prices are trending upwards: for each new supercycle, the average is higher than in the previous cycle. For agricultural prices, the tendency is the opposite: prices are trending downwards over time. This tendency is even more pronounced for the sub-category of tropical agriculture products (not presented here). Trends are more mixed for the metal price index: for the past 100 years, the metals index has followed a downward trend, in line with agricultural prices, but there has been a strong upward trend over the past 15 years that could point to a reversal in this trend.

Recently, there has been an increase in the amplitude of fluctuations around the long-term trend. In a sense, we could say that metal prices are leading the cycle, entering downturns well ahead of agricultural prices, and rebounding more quickly thereafter.

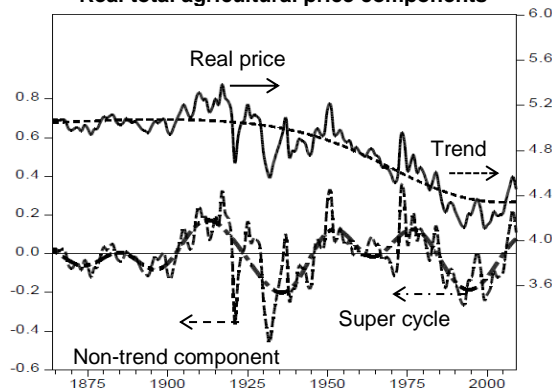
**Real non-oil commodity price components, total index : 1865-2010 (log scaling)**



**Real metal price components**



**Real total agricultural price components**



Charts 1,2,3 Source: Erten and Ocampo (2012)

## Dates of commodity supercycles

### Oil

	1892-1947	1948-1972	1973-1998	1999-
Peak year	1920	1958	1980	2008
Increase during the upturn (%)	403	27	363	467
Decline during the downturn (%)	-65	-23	-70	
Duration (years)	55	26	25	
Ascension	28	11	7	10
Decline	27	15	18	
Average for the real price index	37	25	53	91

Table 1

Source: Erten, Ocampo (2012)

### Metals

	1885-1921	1921-1945	1945-1999	1999-
Peak year	1916	1929	1956	
Increase during the upturn (%)	106	67	98	2008
Decline during the downturn (%)	-70	-52	-47	467
Duration (years)	36	24	54	
Ascension	31	8	11	
Decline	5	16	43	10
Average for the real price index	152	96	85	

Table 2

Source: Erten, Ocampo (2012)

### Agricultural products

	1894-1932	1932-1971	1971-1999	1999-
Peak year	1917	1951	1973	2010
Increase during the upturn (%)	53	90	52	77
Decline during the downturn (%)	-56	-50	-56	
Duration (years)	38	39	28	
Ascension	23	19	2	11
Decline	15	20	26	
Average for the real price index	163	127	87.5	74.3

Table 3

Source: Erten, Ocampo (2012)





### **The Prebisch-Singer hypothesis (1950, 1998)**

*The long-term downward trend of commodity prices fits within a theoretical framework described by Prebisch and Singer in the 1950s. Based on British terms of trade data, Prebisch (1950) and Singer (1950) highlighted the long-term improvement in the terms of trade in the UK, a country that was a net exporter of manufactured goods and a net commodities importer. This analysis affirms the long-term deterioration in the terms of trade for commodity exporting countries.*

*Later, Singer (1998) wrote about the downward trend in the terms of trade for "standardised" goods relative to "innovate" goods, since the later contained a share of economic rent that enabled it to break out of the downward pricing trend.*

*Oil producers benefit from economic rent (due to OPEC's monopolistic management of oil prices), which might explain why oil prices have followed the opposite trend. The weakening of the oil cartel observed over the past year could spell the end of this exception.*

Jacks (2013) conducts an analysis of the same very long period (since 1850) as Erten and Ocampo (2012), but uses the US consumer price index as the deflator. His conclusions are very similar in terms of the dates of the supercycles, although he challenges the validity of the Prebisch-Singer hypothesis by showing that commodity prices (excluding energy and precious metals) follow a slightly upward trend, regardless of the weighting used.

### **Every "peak" hides a giant**

For each supercycle we can identify an economic power that fuels the trend through its own accelerated development. In the second half of the 19<sup>th</sup> century through the early 20<sup>th</sup> century, industrial development in the United States was the driving force behind the first supercycle. The second supercycle was fuelled by the reconstruction of Europe and Japan in the post-Second World War period, which generated sustained demand for commodities and had a lasting impact on prices. The third supercycle (1970-1990) is the exception, since it did not have a

proven engine. It was characterised by a very short upward phase (visible mainly in terms of oil prices following the oil shock) followed by a long downward phase that began in the late 1970s and ended in the late 1990s. As we may see on the table 2, it was not detected on metals' market.

The fourth supercycle, which is still underway, was driven by China's industrialisation and urbanisation, as well as by the country's integration within the global industrial chain after it joined the World Trade Organisation in 2001. This cycle is characterised by China's market share gains and by the declining weight of the advanced countries. It thus seems logical that the slowdown in China post 2007-2010 that is structural and extends beyond a pure business-cycle is behind the ongoing reversal in commodity super-cycle.

As is the case with classic business cycles, demand is the key engine of long cycles: this robust correlation is confirmed by numerous econometric analyses (for example, Radetzki (2006) and Farooki (2010)). Applied to current trends, the downward phase (which began in 2010) will continue to be correlated to the Chinese slowdown, and is likely to persist until the emergence of a new global growth engine of comparable strength.

We are still left with the question of the depth of the downturn in prices currently underway. During the 1990s – the low point of the previous cycle – real prices dropped to very low levels. According to Jacks (2013), these levels were abnormally low, even when placed in the perspective of several decades. Reinhart and Wickham (1994) analysed the factors behind this decline (which was considered permanent at the time), and attributed it to the slowdown in global growth, which is also applicable to the current cycle. At the time, however, the increase in "crude" commodity supplies from the ex-USSR republics was attributable to the collapse of demand from the transformation industries in the eastern bloc countries, and cannot be transposed to the current situation. It thus seems reasonable to expect that the prices will not return to their 1990 lows. This argument is notably made by the IMF (2015).



## Oil price

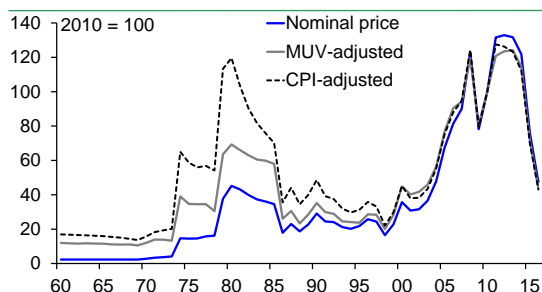


Chart 4 Sources: IMF, WB, OECD, Datastream, BNP Paribas

## Metal price (IMF index)

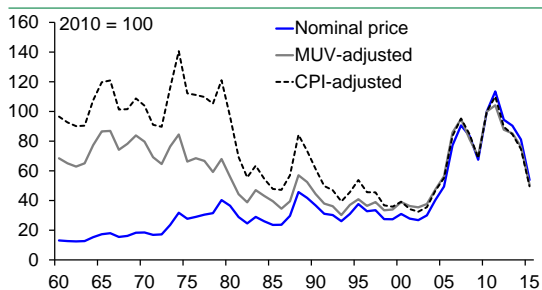


Chart 5 Sources: IMF, WB, OECD, Datastream, BNP Paribas

## Agricultural raw materials price (IMF index)

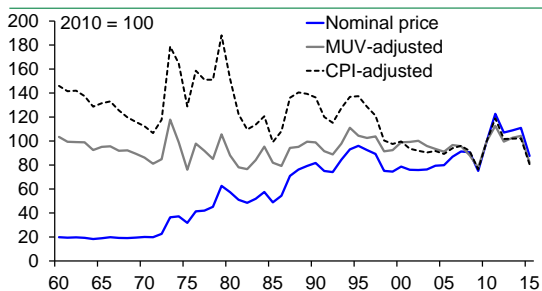


Chart 6 Sources: IMF, WB, OECD, Datastream, BNP Paribas

Although the extrapolation of past trends cannot answer all our questions, it nonetheless provides us with a few clues for assessing the positioning of prices in respect to their long term averages. As of mid-January 2016 the oil price approached its average registered over the previous super-cycle. Deflated by the Manufacturing Unit Value index (MUV) it was only 6% higher than the average of the cycle 1973-1988 and 29% below if deflated by the US consumer prices index (CPI) (Chart 4). The super-cycle's average remains higher than that of the cycle 1973-1998 by 96% or 34% (depending on the deflator used). Thus, even if the oil prices stabilize at the current lows, the long term growth trend would not be interrupted. The analysis of the metals' price is highly sensitive to the deflator and does not allow any clear conclusion concerning the actual prices' positioning. The last available value of the Agricultural Price index (November 2015) is 12% below the average of the previous super-cycle, while the average of the current cycle exceeds it by only 3%, which could call for its possible stabilisation. The use of the US CPI as a deflator for the series confirms this as the latest value is already 39% below the average of the period 1971-1999 (see charts 4 to 6).

## Demand: what could replace the Chinese giant?

As shown in charts 4-6 below, the current commodities supercycle began at the end of the 1990s after a decade of very low prices. During the upward phase of the 2000s, commodity prices surged to new heights in real terms, exceeding the peak levels of previous super-cycles, notably for metals and energy.

This upturn in prices coincides with the surge in growth in the emerging countries, and China in particular. During the upward phase of the current commodities supercycle, from 1999-2010, the emerging and developing markets reported average annual growth of 4.9% (compared to a global average of 3.8%).



Over the same period, China reported double-digit growth averaging 10.1%, and India followed close on its heels with average growth of 7.2%. There is a broad consensus on the impact the two emerging giants had on the pricing dynamics of commodities, which is confirmed by econometric estimates (for a review of these estimates, see the World Bank, 2015).

When China joined the World Trade Organisation in 2001, its role in the world economy was transformed: from a supplier of low-cost products, China became a producer of a wide range of industrial products integrated in the global production chain. Today, with only 20% of the world's population, China produces 24% of the world's electricity, 49% of coal, 60% of concrete, 46% of steel and 54% of aluminium.

Although India's growth rates are enviable compared to the rest of the world, it has fewer ambitions in terms of industrial development. Consequently, it is a more moderate consumer of commodities, and thus has less potential to play the role of accelerator in the commodities supercycle. India still has enormous potential and should be a support factor for the commodities market in the years ahead. On its own, however, India lacks sufficient clout to boost the market without the help of other emerging countries.

Another underlying trend that emerged during the latest commodities supercycle pertains to the advanced countries. Their consumption of commodities levelled off in the 2000s and since 2007 has been trending downwards. We are thus faced with another structural factor: the maturation of demand in the industrialised countries.

Taken in absolute terms or on a per capita basis, their consumption of resources will no longer play the same role as the driving force of commodities super-cycles, as it was the case in the 19<sup>th</sup> and 20<sup>th</sup> centuries. Although demand for commodities is still strong in the OECD countries (which accounted for 43% of energy demand in 2014, for example), the dynamics show that it is now up to the emerging countries to play the main role in the commodities market.

## G7: commodities consumption as % of World

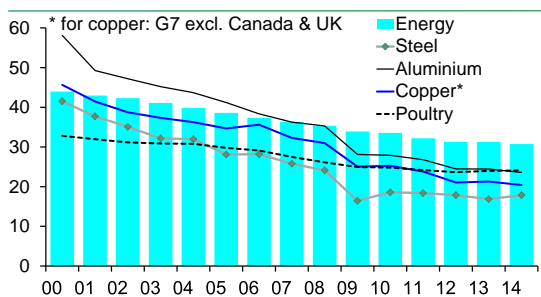


Chart 7 Sources: WSA, BMI, WBMS, ICSG, FAO, BP, BNP Paribas

## Energy market

Between 2000 and 2014, global energy consumption rose 38%, and China accounted for 55% of this increase. In 15 years, per capita energy consumption has increased 3-fold in China, whereas in the rest of the world it has declined 2%.

Over the 14-year period, China's demand for oil has soared 132%. The country added 6.3 million barrels a day (49,000 tonnes) to world consumption (Table 4), and alone accounted for 41% of the increase in world consumption of the period. Oil producers were caught off guard. They were unprepared to increase production by such a huge amount on such short notice, notably because the low prices and cash flow of the 1990s hadn't created a very favourable climate for investment. As a result, the adjustment was passed on to prices: crude oil prices rose from a low of USD 13 a barrel in 1998 to USD 29 in 2000, USD 38 in 2004, and more than USD 100 in 2011-2013 (chart 4).

The situation is similar for the other energy commodities. Since 2000, Chinese energy consumption has practically tripled, and its share of the world market rose from 11% to 23%. China alone contributed more than half of the increase in world energy consumption over the period. Adjusted for the size of its population, per capita energy consumption in China exceeded the world average in 2009, surpassing it by 22% at year-end 2014 (Chart 8).



## Share of China in the global energy consumption

	2000		2007		2014		2000-2014	2000-2014
	MTOE*	%	MTOE*	%	MTOE*	%	Average annual growth rate	Share in global consumption growth
Oil	163	6	186	9	211	12	2%	41%
Gas	23	1	66	2	167	5	15%	16%
Coal	700	30	1 573	45	1 962	51	8%	83%
Total energy	1 002	11	2 134	18	2 972	23	8%	55%

(\*) MTOE: Million tonnes of oil equivalent

Table 4

Sources: Datastream, BNP Paribas, BP (various)

## Energy consumption per head and per year

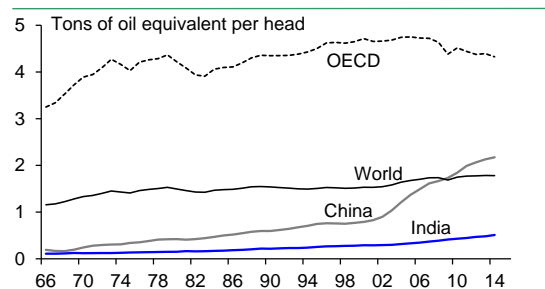


Chart 8

Sources: BP, BNP Paribas

Despite this phenomenal growth, however, per capita energy consumption in China was still only half of the average for the OECD countries (vs. 17% in 2000), which shows that it still has considerable catching up potential. India's success story was much more modest: per capita energy consumption kept pace with the world average. In 2014, India accounted for only 29% of the world average, and 12% of the average for the OECD countries (chart 8).

At a time of accelerating demand from the emerging countries, the OECD countries followed the opposite trend: per capita energy consumption levelled off in the early 2000s and has contracted since 2007. Renewed growth after 2010 did not eliminate the downward trend, which seems to be more sustainable than what we have observed in the past: the cutbacks in energy consumption in 1973-75 and 1979-82 which proved to be short lived.

## China and India oil consumption

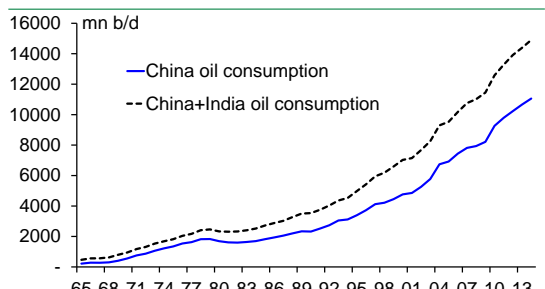


Chart 9

Sources: BP, BNP Paribas

## Market for industrial metals

China's share of world metal consumption has soared over the past 15 years, rising from less than 10% in 2000 to 40-50% in 2014. The country became both the world's leading producer and largest consumer of several different metals.

Chinese steel production has held to a long upward trend. In 1996, China unseated Japan to become the world's biggest steel producer. Since 2000, Chinese steel production has increased 6.5-fold to 815 million tonnes in 2014. Half of the world's steel is manufactured in China. The country's rise is all the more impressive considering that it accounted for only 15% of world steel in 2000, when the current supercycle began. China's share of "apparent" steel consumption has also soared. The country alone



## China in global steel market

	2000		2007		2014		2000-2014	2000-2014
	Mt	%	Mt	%	Mt	%	Average annual growth rate	Share in global consumption growth
Production	127	15	495	37	823	49	14%	85%
Global production	847		1 348		1 665		5%	
Consumption	163	19	414	34	711	46	11%	81%
Global consumption	860	11	1 215		1 537		4%	

Table 5

Sources: World Steel Association (various years)

contributed 81% of the increase in world consumption and consumed 46% of world steel in 2014. Adjusted for imports and exports of goods containing steel, China became the world's leading net exporter of steel, with 54.7 million tonnes of steel exported in 2013, far ahead of Japan, which still ranks second with only 17 million tonnes. In 2007, Chinese consumption of finished steel goods amounted to only 74% of that of the EU, 66% of that of the US and 64% of that of Japan, but by 2014, these figures were 205%, 134% and 137%, respectively. As a result, China became the world's leading producer, consumer and exporter of steel goods.

India has developed its potential more slowly: production has increased 3.2-fold since 2000. India accounted for 7% of the increase in world production over the period (compared to 86% for China). Its share of world production rose from 3% in 2000 to 5% in 2014, but this was only enough to boost it to fourth place worldwide. Its share of apparent world consumption rose to 5% in 2009, where it has held ever since. Given its relatively low market share and the lack of accelerating demand, India will not be able to offset the slowdown in Chinese steel demand (and thus to sustain prices) in the near future, despite comparable population levels.

Like in the energy market, the current steel supercycle has been accompanied by a loss of market share for the developed countries. In 2000, the United States, the European Union and Japan produced 45% of world steel and consumed 48%<sup>1</sup>, but by 2014, market share has dwindled to 22% and 28%, respectively. Total production for these three regions declined 1% over the period 2000-2014, while consumption fell by 11%.

Given China's importance in the world steel market, the current slowdown in Chinese growth should place a bigger strain on prices. In the first ten months of 2015, real prices averaged 38% less than in 2010, and were 52% below the 2011 peak<sup>2</sup>. Unlike the energy market, however, China no longer has any catching up potential in the steel market. Given the structural nature of China's slowdown against a backdrop of declining market share for the main developed economies, we can expect this period of low prices to extend well beyond the current business cycle.

In the non-ferrous metals market, the situation is similar to the one for steel.

In the copper market, China is the world's leading producer, consumer and importer with market share of 33%, 47% and 19%, respectively in 2014. In 2000, China produced only 9% of the world's refined copper while consuming 13%. The country accounts for 92% of the increase in production over the period. The increase in China's copper consumption surpassed that of world consumption as a whole, which signals a reduction in consumption in other countries, including the developed countries, who lost market share. To cite but one example, the United States, the world's second biggest copper consumer, cut consumption in half between 2000 and 2014. Today the US accounts for only 7% of the market, down from 21% in 2000.

In the aluminium market, the third largest market in volume terms after steel and copper, China increased its production capacity 5-fold, and became the world's leading consumer, beating the US to the top spot in 2004. Its market share was only 20% at the time, but

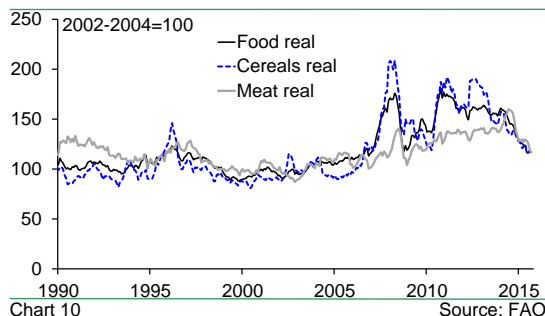


rose to 44% in 2012 according to WBMS estimates. Although India increased production 3-fold, its market share is still small at 4%. Like for copper, the advanced countries have yielded their positions: although the United States is still the world's second largest consumer, its production has declined by 53% and consumption by 26%. In terms of production, its market share has dropped from 15% in 2000 to 3% in 2014 (and from 25% to 11% for consumption).

### Agricultural commodities market

China's awakening disrupted this market less than it did for the industrial commodities. Traditional producers, like the United States and Europe, managed to maintain their market share with the arrival of the emerging countries. In 2013-14, the US produced 23% of the world's wheat compared to 15% for the EU, 17% for China and 7% for India. Moreover, these market shares have not changed much over the past 15 years. As to meat and cereal consumption, the change has been fairly small. China consumes 22% of the world's cereals in 2014, compared to 23% in 2000. The same observation can be made in the meat market. In 2014, China accounted for 12% of world chicken consumption, compared to 3% for India, 13% for the United States and 9% for the EU. In 2000, they consumed 14%, 2%, 17% and 11%, respectively. The per capita consumption of farm products increased over the period, but much more moderately than the trends observed in the energy and metal markets.

### Real prices of food commodities

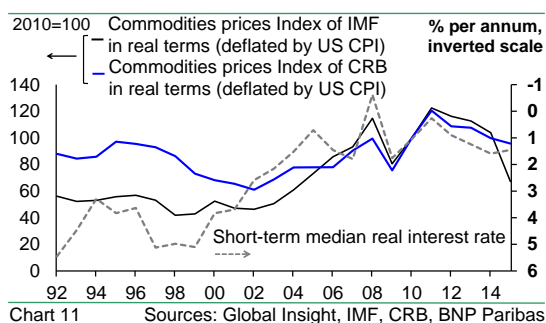


Consequently, for agricultural commodity prices, the impact of Chinese consumption (and that of the emerging markets as a whole) was a less obvious engine of the commodities supercycle, which probably explains the smaller amplitude in price fluctuations (Chart 10). Yet food product pricing trends were no exception to the general trend: prices rose between 2000 and 2010, with the upturn extending until 2014 for meat prices, and have been trending downwards ever since.

### Fiscal and monetary policies amplify structural trends

The high correlation between commodity price movements, the increase in volatility over the period 2004-2015 – which affected all commodity categories without exception – and the small role the Chinese factor played in explaining agricultural price fluctuations suggest that other factors lay behind the global demand for commodities. Over the past 15 years, there has been a strong correlation between real interest rates, overall fiscal spending and real commodity price indexes (see charts 11 and 12). The downturn in the pricing momentum of the current supercycle coincides with the reversal of fiscal and monetary policy trends.

### Real interest rate and real commodities prices



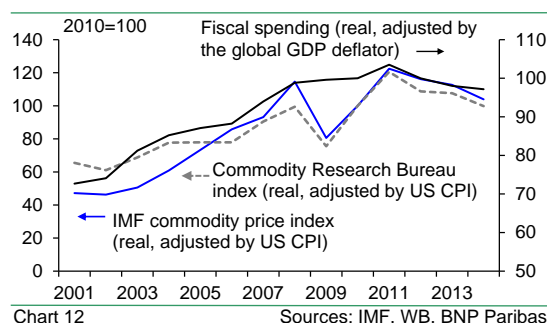
As we may see on the chart 11, the worldwide decline in real interest rates since 2000 (we used the world median to smooth the impact of hyperinflations observed in some emerging countries at the beginning of the period) as well as the fiscal expansion (chart 12)





fiscal stimulus may have acted as accelerators for price increases. Similarly, the tightening of macroeconomic policy seen in the increase in the median real interest rate, and the stabilisation of fiscal spending worldwide in real terms since 2010, coincide with the end of the upward phase of the current supercycle. Largely unintentionally, economic policies may well have played a pro-cyclical role in commodity pricing dynamics.

### Commodity prices and fiscal spending



The dynamics of the global commodities' demand over the past highlights both structural and cyclical factors. The structural (or super-cyclical) trends include China's industrial development during the 2000s, its recent slowdown as well as the market share losses by the advanced countries. The current deceleration of world growth adds a cyclical effect that may be exacerbated by the economic policies, at least as far as their impact on the global commodities market is concerned.

### Supply adjustments: always lagging behind the curve

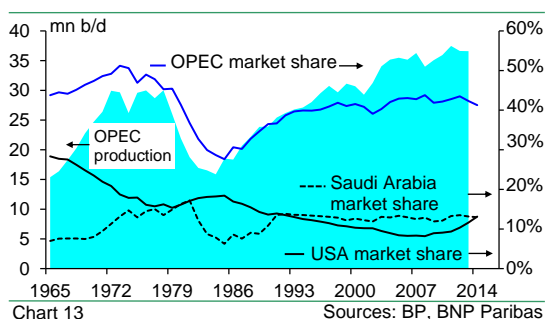
Thus, the current period is characterized by an increased uncertainty of the commodity prices. Commodity producers must adapt to this highly volatile environment by adjusting margins as well as the level of production to keep pace with demand trends. In this part of our review, we will look at ways to adjust supply to meet fluctuations in the demand for commodities.

### Energy: an ineffective oil cartel

The world's main oil producers seem to be waging a battle to maintain market share, which has undermined OPEC's role as the "price maker" for the world oil industry. This has been true, in any case, since 2014, when against all expectations OPEC maintained its production targets despite contracting demand and a sharp drop in prices. OPEC even increased production by 1.5 million barrels a day in December 2015.

Yet casting OPEC's recent decisions in terms of a battle for market share raises a few questions, notably if we take a long-term historical perspective. In chart 13, we can see that despite the increase in US market share since 2008, the OPEC cartel's market share remains roughly stable, at 41%, close to its average level registered since 1965. Indeed, its market share has remained relatively flat since the mid-1990s, and the decline observed in 2013-2014 is negligible compared to past fluctuations. Saudi Arabia's market share, which has the highest weighting in OPEC, has remained surprisingly stable despite the increase in the US production (its "main competitor"). Therefore, the increase in US unconventional oil production does not seem to have cut into OPEC's market share (only a little at best), especially that of Saudi Arabia.

### Market share of principal oil producers



OPEC's decision to maintain supply is all the more perplexing considering that the resulting drop-off in prices has become extremely costly for public finances and potentially for the financial sectors of the oil



producing countries. Granted, the richest countries (in oil terms) have accumulated savings in their sovereign funds that will enable them to smooth the immediate consequences. Yet the medium to long-term impact of a long period of low prices could drive the poorest countries into poverty and force the others to review their development models<sup>3</sup>.

Regardless of the reason of the OPEC countries' reticence to scale back production in response to contracting demand (the latter resulting from the joint impact of structural and cyclical factors, as we have shown in the previous section), this choice makes the cartel *de facto* non-operating. Yet it is this monopolistic behaviour that differentiates oil from the other commodities and protects it from the general downward trend in real prices (Prebisch-Singer hypothesis, cited above). Unless OPEC changes its policy, we can expect to see oil prices decline further. In the short term, this tendency could be exacerbated by the sell-off of oil stockpiles, which have reached record levels.

### Recovery potential in Iran, Iraq, Syria and Libya

World supply of energy commodities has been hurt by unstable situations in several Middle Eastern oil-producing countries, including Iran, Iraq, Syria and Libya, all of which currently have unused production capacity. In 2000, these four countries produced 8.4 million barrels/day (b/d) of crude oil, compared to only 7.4 million b/d in 2014. Potentially, they could rapidly boost production by 1 million b/d, which represents 1.2% of world production in 2014. After lifting the international sanctions, Iran alone could add 0.8 to 1 million b/d if production were to return to the 2008 peak. Nonetheless, these amounts fall far short of the new production capacity offered by unconventional oil.

### US unconventional oil & natural gas: signs of levelling off

From early 2007 to September 2015, US production of unconventional oil increased by 4 million barrels per day, a 4.3-fold increase. Its share of the US oil mix rose from 18% to 44% of the total. The increase in US unconventional oil production accounted for

65% of the increase in world crude oil production over the period, lifting the US to the number one spot among world oil producers, with production of 11.6 million b/d in 2014, ahead of Saudi Arabia (11.5 m b/d) and Russia (10.8 m b/d). Total oil production in the US increased by 71% between 2006 and 2014, compared to 8% for Saudi Arabia and 10% for Russia.

The development of the US natural gas sector was even more spectacular. Thanks to shale gas, the US managed to halt its long decline in market share: shale gas accounts for all of the increase in natural gas production in the US, and production has boomed from a low of 18 billion cubic feet (bcf) in 2005 to 26 bcf in 2014. Thanks to this increase, the United States outranked Russia as the world's largest natural gas producer since 2008.

Whereas technological advancements have played a decisive role in the development of US hydrocarbon production, pricing dynamics seem to have had a rather mixed impact. For oil, the decline in prices since 2015 coincides with the end of the period of double-digit growth in production observed since 2012, but the contraction in production has been very small with regard to price fluctuations in recent months. In November 2015, oil production was down 2% year on year. In the natural gas market, in contrast, price dynamics do not seem to have affected production, which has barely slowed (+4% y/y in November 2015) (chart 14).

### Oil and gas production in the USA: is there any relation with the price?

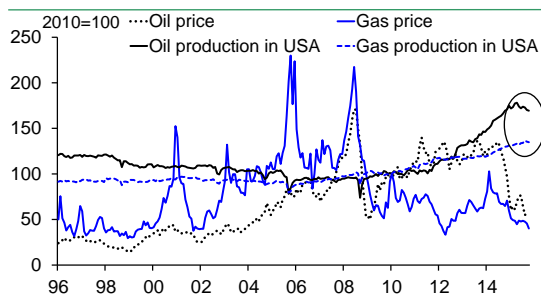


Chart 14

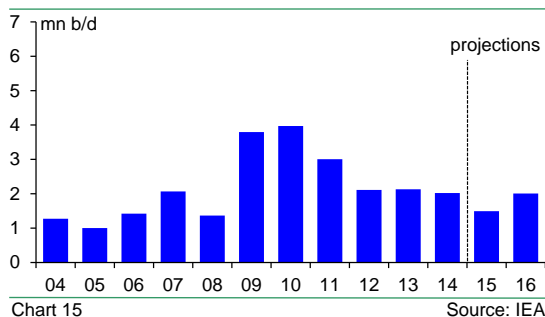
Sources: AIE, Datastream, BNP Paribas



## New supply: inertia of new projects

The oil market is in a supply glut. According to IEA, OPEC alone has surplus production capacity of 1.5 m to 2 m b/d, which if necessary, would enable it to boost world supply by 2%.

### OPEC: surplus crude oil production capacity



Looking beyond this extra production capacity which can be easily brought on board, implementing new projects is a long and costly business. With the current slowdown in demand, commodity producing companies will have to revise their investment strategies. As during past periods of pricing downturns, they will have to make some painful investment decisions.

Given the highly volatile and fairly unpredictable behaviour of commodity prices, the return on investment of these projects becomes highly unstable. For this reason, investment in new commodity extraction projects slowed sharply in the second half of the 1990s, following a drop-off in prices that was exacerbated at the time by the Asian crisis. It took a while before investors reacted to the accelerated growth of demand in the 2000s. According to the IEA, during the upward phase of the most recent oil supercycle, investment in fossil fuel production increased from USD 400 bn in 2000 to USD 900 bn in 2008, a 2-fold increase in real terms. Investment still amounted to USD 950 bn in 2013, five years after the pricing curve began to dip. Few projects were calibrated to prices as low as they are currently.

According to the same source, none of the large-scale projects currently under construction will be profitable at prices of less than USD 80 a barrel.

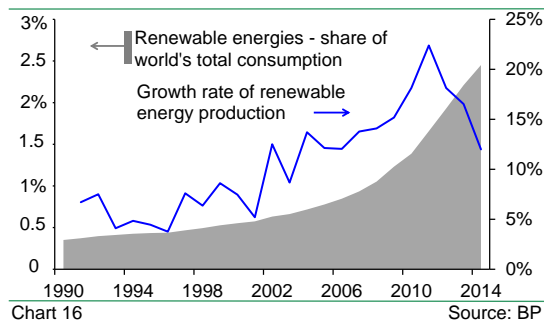
The potential to boost supply should naturally wind down in response to lower prices. This adjustment has already started. According to Wood Mackenzie (2016) in reaction to the drop of the oil prices the major producers have scaled back or fully stopped 68 big projects for the total cost of USD 380 bn of which USD 170 bn planned for the next 5 years. The most technically complex projects (offshore fields in Angola and Nigeria, Canadian oil sands, the Kashagan field in Kazakhstan<sup>4</sup>) are the first concerned. According to the same source the impact of the suspension of investments on the supply in the short term will be weak, but it will reduce the potential supply by 1.5 mn bpd by 2021 and by 2.9 bpd by 2025. The projects that were put on stream in 2015 have relatively low costs, like Appomatox in the Mexican Gulf that is profitable at USD 50/barrel. The drop in prices registered in end-2015 and the early 2016 will further complicate the financial equation for oil companies. Some of them, like BP, go beyond the cuts in the investment budget: in addition to the USD 7 bn cut in new projects' financing, the company envisages to cut about 1/5 of its staff of the fields' exploration, in particular on the fields in the North Sea region, where the production struggles to be profitable at current level of prices.

### Competition from renewable energy sources

The growing importance of renewable energy production is another particularity of the current commodity supercycle. Supported by policies to combat industrial pollution and global warming, investment in renewable energy, including hydroelectricity, increased from USD 39 bn to USD 249 bn in 2013. The increase in renewables production covered 7.5% of the new energy demand of the period 2000-2014. Thus, even if the fossil energies generate today more than 90% of the total world energy mix, the potential of renewables cannot be neglected any more. However, the growth in the clean energy production is slowing down since 2011 (chart 16) and the current fall in prices on traditional energies may well have reinforced this trend in the short term.



## Renewable energies



## Metals

Faced with the drop-off in metal prices, producers will have to reduce their costs and/or adjust production levels by cutting back production at unprofitable sites. According to Bank of America-Merrill Lynch estimates, in mid-October 2015 spot prices were below cost for 50% of the producers of aluminium, nickel and coking coal. This suggests that plans will be launched soon to cut costs and probably to close the most costly production sites. This is the case for 35% of iron ore producers and 30% of platinum group metal producers. Producers of copper, tin, zinc and thermal coal are in better positions: less than 10% of them have encountered problems of this kind.

After a long period of costs' increases (made possible by rising prices), industrial producers in the mining sector will have to adapt to this new, descending, phase in the commodities supercycle. Low oil prices and currency depreciations in the single commodity exporter countries should help make this adjustment process easier for some of them. In contrast, debt contracted at a time of high commodity prices and expectations of strong demand growth risks making this adjustment process much more difficult (in particular if it is in foreign currencies).

The energy market continues to be disrupted by OPEC, which is no longer protecting the revenues of the oil producing countries despite the cost for their economies. If this situation were to be maintained in the medium term, oil could become a commodity like any other, with

a long-term tendency for prices to decline, while moving in line with cyclical fluctuations. For the moment, the strategy which consists in eliminating the marginal producer (the shale oil and gas in the US) does not pay much. We may reasonably expect that the new supply of the oil fades in reaction to the low prices and the decline in investments starting from the fields with high costs. Yet as we will see in the next section, there is a risk that this adjustment process will be postponed due to the heavy debt burden of commodity producers (contracted at a time when commodity prices were high).

## Financialization: a disruptive or stabilising factor?

Although "real" trends in the commodities market now seem to be clear, there is still room for debate over the role commodities play for market operators as financial assets among others.

Commodities markets and financial markets overlap at several levels. First, commodities generate a vast market of derivatives used to provide coverage for various market participants, as well as hedging operations for traders. Commodities also represent real assets used as collateral in financing operations (i.e. trade finance, to provide the simplest example). The valuation of commodity sector companies is highly correlated to the prices of the commodities they produce, and thus to their capacity to raise debts. At the macroeconomic level, there is also a correlation between the forex markets of single-commodity exporting countries, whose currencies are sensitive to the prices of the commodity they export. Then there are the structured financial products, which provide a mix of everything (bonds, currencies, equities and derivatives) for increasingly fine-tuned hedging purposes.

### Asset price and credit channel: a disruptive effect and source of inertia

The role commodities play as collateral in debt financing operations can disrupt the response of commodity suppliers to falling prices (at least in the short term), which in turn risks exacerbating price fluctuations.



The upturn in commodity prices that began in 2000 has supported investment by commodity producing companies by attracting financial flows. The cash flow and equity prices of commodity sector companies generally kept pace with commodity pricing trends, facilitating their access to bank loans and market financing in order for them to continue developing production. Through this positive leverage effect, they are able to develop new supply, including more costly projects made possible by new technology. To take the oil industry as an example, Domanski et al. (2015) estimates that corporate debt in the oil and natural gas sector rose from USD 1 trillion in 2006 to USD 2.5 trillion in 2014.

How will these indebted and heavily indebted companies react to the current decline in commodity prices? Some will continue to pursue unprofitable operations in order to generate the cash flow necessary to cover at least part of their debt or to serve as a basis for debt renegotiation. As cash from operations contracts, some producers may find it is in their interest to maintain or increase production levels to meet debt servicing charges and dividend payments. Maintaining the dividend helps support their equity price comparing to their competitors. An excessive debt burden (defined in relation to current prices) becomes a factor that postpones the necessary production cutbacks. The deep fall in prices during the recent months makes this strategy an increasingly risky play.

Even worse, the situation seems to be snowballing. According to IEA, between 2012 and Q1 2014, the net operating income of energy sector companies increased by only USD 59 billion, 12% more than the 2010-11 average. Over this same period, spending by these companies increased 20%, rising from a 2010-11 average of USD 548 billion to USD 684 billion in 2012-14. The gap between cash earnings from operations and the expenses (investment and dividends) by the oil and gas companies surged from USD 18 billion in 2010 to USD 110 billion in Q1 2014. The share of net cash earnings from operations as a source of financing for spending eroded from a 2010 peak of nearly 90% of the total to only 60% in 2013. The shortfall was offset by debt and to a lesser extent

by asset sales (5-10%). For indebted companies, the need to maintain cash flow could push them to produce and sell more in order to offset the revenue shortfall due to lower prices. This would not only exacerbate the drop-off in prices, but it would leave unchanged the market shares of the different participants (and could even have the opposite effect of the one expected).

### Pure speculation: the beginning and the end

Greater price volatility, especially over the past five years (chart 17), is often attributed to the development of hedging operations by the investment banks.

Less restrictive regulations in 2008 made it possible for financial institutions to develop stock-building activities. Driven by very low interest rates and eased regulations, investment banks built up vast commodity stocks (especially in oil and metals) to use in hedging operations, notably as collateral on leveraged products and exchange traded funds. Goldman Sachs estimates that in 2011, the accumulation of commodity stocks associated with these activities might have been responsible for a third of the increase in oil prices at the time.

### Standard deviation of changes in real prices\* of raw materials

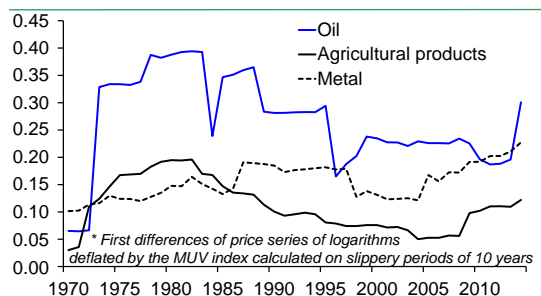


Chart 17 Sources: IMF, WB, OECD, Datastream, BNP Paribas

"Physical" metal consuming companies were not satisfied with this new market situation, notably given this new players' importance in the market and the ensuing increase in storage costs and the long shipment periods for "physical" merchandise (which



could take as long as 18 months). Participation in both financial activities and commodity trading increased the temptation for price manipulation while the risks resulting from these activities have caught the attention of political leaders<sup>5</sup> and the market regulatory bodies<sup>6</sup>. New regulations were enacted in 2014 and 2015<sup>7</sup>, restricting these practices in the aim to increase market fluidity.

The game came to an end with tighter regulations, including the liquidation of nickel stocks in Quindao, China, in the second half of 2014 and Goldman Sachs' disposal of the Metro aluminium warehouses to a structure outside the banking sector. At the same time, JP Morgan sold its commodity trading activities to Mercuria. Other sector players announced that they were also pulling out of the business. Price volatility increased sharply for metal and agricultural prices at that time, which might be due to these stocking and destocking movements following regulatory changes. The causality relation between inventory changes and price fluctuations, which might be expected from speculative behaviour (such as holding inventory to drive up prices), could not be officially established for copper while the results were mixed for aluminium.

To summarize, the leverage used by mining sector companies could extend the timeframe necessary to strike a new balance in the commodities markets at a time of sluggish demand, which strengthens price declines and reinforces the risks. Investment bankers' infatuation with commodity storage activities finally seems to have come to an end.

## Waiting for a new "giant"

The downturn in the commodities supercycle is clearly underway. Alongside structural factors, such as the end of China's intensive industrial development and the deindustrialisation of the wealthy countries, the effects of the business-cycle are also at play due to sluggish world growth. These cyclical effects are strengthened by economic policies that may well exacerbate the price moves on commodity markets.

Looking beyond a stimulus package (which may come from the Chinese authorities looking to smooth the impact of the transformation of the country's economic model<sup>8</sup>) or a possible acceleration of growth in Europe or Japan following the USA, there are few (if any) factors likely to boost demand for commodities in the near future. New "structural" demand strong enough to launch a new commodity supercycle will surely come from the emerging countries, thanks to their strong catching-up potential. Among these, India seems to have the strongest one<sup>9</sup>. For the moment, however, none of the emerging countries is sufficiently strong enough on its own (notably in terms of savings) to fuel industrial development on the same scale as China did over the past 20 years.

In the short term, supply-side adjustments will be hampered by the need for mining sector companies to repay debt contracted during the period of high prices. This debt has become excessive in the current pricing environment, which could cause problems for certain companies, as well as for the budgets of single commodity exporting countries who have not prepared for a downturn.

The fact that the OPEC is not playing its role in regulating oil prices ends the monopolistic rent this commodity has been enjoying for decades. With the growth slowdown in China the expansion in global demand is expected to remain moderate. The market will therefore be dominated by supply. Given the existing excess capacities in the Middle-East the supply should remain abundant. The cut in investment should help to rebalance the market with the time, but the new actors (and notably the shale oil producers) will quickly react on any price upswings. The real prices will therefore remain substantially below their pics observed during the past ten years.

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## NOTES

<sup>1</sup> Once again, this figure refers to apparent consumption

<sup>2</sup> 38% and 46%, respectively, if nominal prices are adjusted by the US consumer price index.

<sup>3</sup> For more details on this subject, see IMF (2015) - Fiscal Monitor

<sup>4</sup> A good example is the giant Kashagan oil project located in the northern part of the Caspian Sea. This is the largest oil field to be discovered recently. Technical problems and construction delays have also made Kashagan the most costly oil project on record. Development costs have reached USD33bn. Today, production at this oil field is not profitable at prices of less than USD80 a barrel. At the time this article was written, crude oil prices had fallen to below USD30/barrel.

<sup>5</sup> We can cite the report by the Permanent Senate Investigation sub-committee from 2012. It contains case studies on the three main investment banks – Goldman Sachs, Morgan Stanley and JP Morgan – and recommends the separation of banking and physical commodity trading activities, to limit the size of these activities to 5% of Tier 1 capital, to increase transparency, to reduce opportunities for complementary business between physical and financial transactions, and to establish minimum standards for capital and insurance.

<sup>6</sup> See the conclusions of the UK Financial Conduct Authority, September 2015

<sup>7</sup> Notably the LME for trade in non-ferrous metals

<sup>8</sup> For further information on Chinese growth, see Peltier (2015)

<sup>9</sup> Focused on the services sector, the Indian development model is very different from the one China has followed in recent years (Melka, 2015). Today, the catching-up effect seems to be accelerating, notably for energy consumption, but at a slower pace than in China between 2000 and 2010, when per capita energy consumption in China rose from 50% of the world average to 103%. In India, consumption rose from only 19% of the world average in 2000 to 29% in 2014.



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