Jean-Claude Trichet: Globalisation, inflation and the ECB monetary policy

Lecture by Mr Jean-Claude Trichet, President of the European Central Bank, at the Barcelona Graduate School of Economics, Barcelona, 14 February 2008.

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Introduction

I would like to start by thanking Banco de Sabadell for hosting this event and thanking the CREA and the Barcelona Graduate School of Economics for offering me the opportunity to hold this lecture. It is a privilege for me to be here today, at this School which represents a prominent example of how Europe can successfully benefit from globalisation, and become a powerhouse of knowledge production and dissemination. Today, I would like to discuss the consequences for the euro area prices brought about by the forces of globalisation, and their implications for monetary policy. As an open-minded practitioner in front of so many distinguished academics, I am looking forward to learning a lot from your comments and questions.

Globalisation is certainly one of the most analysed and discussed economic phenomenon of our time. The notion of "globalisation" subsumes the concepts of cross-border market integration, country and policy interdependence, and fundamental historical change. Economists classically think of globalisation as a process of market integration that leads to price convergence across markets for goods, labour and services worldwide as well as to growing trade and financial flows.

Outside economists' circles, however, globalisation refers to a more general phenomenon of growing interdependence between countries including also technological, environmental or social aspects. It encompasses many multifaceted phenomena, from the diffusion of knowledge and cultural patterns, to the unprecedented speed and freedom of communication and travel in the age of the Internet and jet.

Knowledge and ideas travel much faster than physical goods and people, a key distinctive aspect of the current wave of globalization compared to previous episodes. A striking aspect is the emergence of what has been called "self-organizing collaborative communities," like those that have produced Linux and Wikipedia. Academic economists know a lot about this, as they have been part of a similar community for long time, comprising the research universities of the US and Europe.[1]

The current phase of economic globalisation has also coincided with the reintegration into global markets of China, India and the former Soviet bloc, transpiring into the doubling of the effective global labour force from about 1.5 to 3 billion. For this reason, the current debate about globalisation is very often indistinguishable from the debate about the advent of emerging economies and their systemic implications.

Globalisation brings together in public debate a broad set of policy issues, such as trade liberalisation and competition from low-wage economies; foreign direct investment and offshoring; international capital flows; immigration and pressures on labour markets in mature economies; the implications of the global spread of technology, as reflected in discussions about intellectual property rights, for instance; or the protection and promotion of cultural diversity. On the one hand, globalisation is celebrated by its supporters because of the

[1] See Leamer, E. (2007), "A Flat World, A Level Playing Field, A Small World After All, or None of the Above? A Review of Thomas L. Friedman's The World is Flat," *Journal of Economic Literature,* Vol. XLV, March, pp. 83-126.

higher quality of life it brings about, with very similar words as those Keynes used almost a century ago to describe the heydays of the "liberal international economic order" before World War I.[2] On the other hand, the sweeping and relentless demise of physical and man-made barriers to the mobility of goods and services, ideas and people, is criticised because it supposedly also does away with necessary protections for disadvantaged workers and households in poor and rich countries, the environment and cultural diversity.

All these developments have put globalisation at the centre of international policy debates. The European Union considers globalisation to be "one of the major challenges" it is confronted with and defines the phenomenon as "the increasing interdependence of the global economy and ever-growing competition on international markets."[3]

The increasing interdependence of the global economy is also of paramount importance for central banks as it possibly affects, among others, the formation of international good prices, the inflation process, the valuation of assets, the cross-border constellation of capital flows, and international financial stability.

I will touch upon some of the consequences of globalisation forces for price stability, and the implications and challenges for monetary policy. Monetary effects of globalisation were already a topical issue in 16th century Spain, during the establishment of global colonial empires, when large influx of silver from the Americas led to unprecedented increases in prices first in Spain but then also in the rest of Europe, accompanied by substantial external imbalances. Then as now the debate was whether inflationary pressures were just about relative prices or should also have implications for the price level. This incident of an early phase of globalisation was associated with the blossoming of key contributions to economics such as the quantity theory invented by the School of Salamanca, but also, quite alarmingly, the rise of protectionist mercantilism. Catalonia was indeed an early victim of protectionism, as only in 1778 it was allowed to trade with the Americas by decree of Charles III.[4]

Setting the stage: globalisation and the euro area

As globalisation means different things to different people, there are also many popular measures of globalization. For example, the 2005 issue of Foreign Policy magazine ranked countries in terms of their degree of globalisation based on a variety of criteria, including international travel and tourism, membership in international organizations, contributions to United Nations peacekeeping missions, international telephone traffic, Internet hosts and so on. The three most globalised countries turned out to be Singapore, Ireland and Switzerland;

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2 "What an extraordinary episode in the economic progress of man that age was which came to an end in August, 1914! […] The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his door-step; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, and share, without exertion or even trouble, in their prospective fruits and advantages; or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend. […] But, most important of all, he regarded this state of affairs as normal, certain, and permanent, except in the direction of further improvement, and any deviation from it as aberrant, scandalous, and avoidable." John Maynard Keynes, *The Economic Consequences of the Peace*, New York: Harcourt, Brace and Howe, 1920, pp. 10 –12; quoted by M. Wynne (2005), "Globalization and monetary policy," *Southwest Economy* , Federal Reserve Bank of Dallas, Issue 4, pp. 1-8.

3 See Berlin declaration of 25 March 2007.

4 Papademos, L. (2007), "The effects of globalisation on inflation, liquidity and monetary policy", speech delivered at the NBER conference on "International dimensions of monetary policy," Girona, 11 June 2007.

the United States was fourth.[5] When one looks at measures focusing more narrowly on economic globalisation, however, the striking and not widely known fact is that Europe, and the euro area in particular, turn out to be more closely integrated with the global economy than the US.

Globalisation, if narrowly defined as growing trade openness in response to declining trade and transport barriers, has been ongoing for decades and in this sense is not a novel phenomenon. Over the last decade, however, this process appears to have accelerated, and the increasing trade integration has been accompanied by signs of a rapidly growing interdependence of economies also via production and financial market linkages, with two broad factors underlying such a development. First, falling costs of moving not only goods, but also services and information across borders, have led to changes in the production processes, most notably related to the international fragmentation of production (Chart 1). Second, there has been a large expansion in global productive capacity on account of the opening up of emerging economies to international trade and production.

Against this backdrop, euro area external trade as well as flows and stocks of foreign assets and liabilities have been growing strongly. This has been partly as a result of the increasing role of New EU Member States as trade partners, as well as rapidly increasing imports from Asia (especially China). Thus the trade openness of the euro area has increased rather markedly through time, especially since the early 1990s, and is growing more rapidly than in either the USA or Japan. In particular, trade volumes have also expanded strongly for the euro area (from 33 % of GDP over the period 1997-2000 to 38 % of GDP over the period 2001-2006 ; over the same periods, figures for the US stand at 24 % and 25 % and figures for Japan stand at 21 % and 23 %), with export and import volumes continually and rapidly outpacing the growth rate of GDP over the past quarter of a century (Chart 2a and 2b). Meanwhile, over the past decade world cross-border capital flows have also been growing strongly, increasing many-fold (from 4 % of aggregate GDP in 1994 to more than 14% in 2005 for the OECD countries) as a percentage of GDP (Chart 3a). A similar story holds for the euro area (Chart 3b), where the ongoing strength of capital flows is reflected in the considerable increase in outward and inward FDI virtually doubling (from 20% of GDP to 35 % of GDP as regards outward investments and from 15 % to 30 % of GDP as regards inward investments) as a percentage of GDP since 1999 (although cross-border bank lending has also significantly increased in recent years). Strikingly, while euro area external assets and liabilities at the end of 2006 amounted to 148.4% and 160.5% of GDP, respectively, the same ratios in the US were smaller, at 104.2% and 123.5% of GDP.

Globalisation and price developments

Economic theory predicts that this ongoing process of crumbling of national economic borders, and the associated increase in international flows of capital, goods and services, should have resulted into greater pressure towards price equalization and convergence, for assets, commodities and factors. Given the different speed at which national borders have shrunk, one would expect a greater degree of convergence for asset prices than for goods and factor prices.

The available evidence seems to support this contention. While there is ample evidence that assets with similar risk characteristics yield very similarly returns in international financial markets, prices of similar goods and services are still quite different across countries. For instance, many observers have pointed out that long-term real interest rates in the major currencies have converged to very similar (low) levels, particularly since 2000. Moreover,

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[5] *Foreign Policy* (2005), “Measuring Globalization: The Global Top 20,” May/June 2005, pp. 52–60; quoted in M. Wynne (2005); “Globalization and monetary policy,” *Southwest Economy* , Federal Reserve Bank of Dallas, Issue 4, pp. 1-8.

there has been a large increase in cross-country correlations of these rates, suggesting that these dynamics are driven by a global factor which is quite independent from local developments in real economic growth.[6]

Likewise, a simple way to gauge the lack of overall price convergence is to look at the World Bank's latest PPP calculations, according to which prices in China and India in 2004 were still on average roughly ½ and 1/9 of their dollar counterpart in the United States.[7]

However, a remarkable development associated with globalisation has been that, despite the limited convergence in price levels, inflation developments have seemingly reflected the influence of global factors.[8]

This influence might be due to possible structural effects of globalisation on factors affecting global trend inflation; but also cyclical effects of globalisation forces – such as the soaring oil price from 1999-2007 – may provide part of the explanation.

You won't be surprise to hear from a central banker that inflation is ultimately, always and everywhere a monetary phenomenon and, as such, determined by monetary policy. Indeed, the influential observers who have connected the current period of lower and more stable inflation across the world with the workings of globalisation have done so by carefully linking it to either its influence on the incentives to engineer an inflationary bias;[9] or the emergence of an international consensus on putting price stability centrepiece as the overriding goal of independent central banks.[10]

Nevertheless, the forces of globalisation may have indeed affected cyclical inflation developments through the following two channels. First, the influence of foreign conditions in the price and wage formation process may have increased because of heightened international competitive pressures, possibly decoupling inflation and standard domestic measures of macroeconomic slack.[11] Second, to the extent that the process of globalisation has resulted in a number of terms of trade shocks – attenuated increases in prices of imported manufactured goods and accentuated increases in commodity and food prices – these may have in turn worked their way into short-run fluctuations in headline inflation.[12] While there is a widespread presumption that through the latter channel globalisation forces have exerted cyclical downward pressures on inflation, it is clear that potentially favourable "tail-winds" are increasing turning into contrarian "head-winds", posing potentially serious challenges to the maintenance of price stability. This would especially be the case were they to spill over into inflation expectations by the public, leading to their unanchoring.

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6 See, e.g., Reichlin, L. (2006), Panel remarks at Conference "Financial Markets and the Real Economy in a Low Interest Rate Environment," *Monetary and Economic Studies*, 24 (S-1), Institute for Monetary and Economic Studies, Bank of Japan, pp. 247-52.

7 See World Bank, http://devdata.worldbank.org/wdi2006/contents/Table4_14.htm.

8 Ciccarelli, M. and B. Mojon (2005), "Global inflation," ECB Working Paper No. 537.

9 Rogoff, K. (2003), "Globalization and Global Disinflation," *Economic Review,* 4th Quarter, Federal Reserve Bank of Kansas City, pp. 45-78.

10 Goodfriend, M. (2007), "How the World Achieved Consensus on Monetary Policy," *Journal of Economic Perspective*, Volume 21, Number 4 (Fall), pp. 47–68.

11 Chen N., J. Imbs, and A. Scott (2007), "The Dynamics of Trade and Competition," Paper presented at ECB conference "Globalisation and the macroeconomy", July.

12 Rogoff, K. (2006), "Impact of Globalization on Monetary Policy," in Federal Reserve Bank of Kansas City, *The New Economic Geography: Effects and Policy Implications*, pp. 265-305..

The cyclical impact of globalisation on euro area prices and wages

Here, I will discuss the impact of globalisation on manufacturing and commodity prices and ultimately consumer price inflation in the euro area, arguing that there is evidence of only a small overall net dampening effect in last 5-10 years, reflecting the balance of opposite relative price shocks.[13]

Import prices

As I argued before, intra-euro area imports have been growing strongly, but euro area imports from low-cost countries such as China and the new EU Member States (henceforth NMS) have been growing even more rapidly.

Based on highly detailed data disaggregated both by sectors and countries over the period 1995-2004, Chart 4a shows that the level of import prices (proxied by absolute unit value indices) from China and the NMS are estimated to be approximately one-quarter the import price of total euro area import prices, and about one-fifth the price of imports from high-cost countries.[14] Since the start of the 2000s, the share of low-cost countries in extra-euro area manufacturing imports has increased from just over one-third to almost a half (Chart 4b).[15]

Rising imports from low-cost countries are putting downward pressure on extra-euro area manufacturing import prices. Overall, it is estimated that the increase in import penetration from low-cost countries over this period may have dampened euro area import price inflation by an average of 2.1 percentage points each year, an effect almost equally accounted for by China and the NMS.[16] The overall impact could be decomposed into two components (Table 1): the first is the "share effect", which captures the downward impact on import prices of the rising import share of low-cost countries combined with the relatively lower price level of low-cost import suppliers (1.6 percentage points per year); and the second due to differentials in the growth of import prices (the "price effect"), which captures the impact of lower import price inflation from the low-cost countries relative to the high-cost ones over the sample period (0.5 percentage points per year).[17]

So far, I have only referred to the downward impact of low-cost countries on manufacturing import prices. However, there have also been globalisation-related effects on euro area import prices working in the opposite direction as the strong growth in the non-OECD economies in recent years seems to partly explain the significant rise in the prices of oil and non-energy commodities since 1999.[18] Overall, Chart 5 shows how globalisation forces have helped to keep extra euro area manufacturing import prices fairly flat since the start of the 2000s, while the rising price of oil and other commodities (particularly metals and foods) are reflected in the stronger growth of total extra euro area import prices over the same period.

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[13] See for further details ECB (2008), "*Globalisation, trade and the euro area macroeconomy*," Monthly Bulletin, January.

[14] This calculation is subject to caveats, notably that the accuracy of the results may be affected by the fact that unit value indices do not control for changes in quality.

[15] Among the low-cost countries, China and the New EU Member States (NMS) were the main contributors to this increase with their shares roughly doubling since the mid-1990s to stand at around 12% and 14% respectively in 2004.

[16] See ECB (2008).

[17] This methodology follows the methodology in Kamin, S., Marazzi, M. and Schindler, J. (2004), "Is China exporting deflation", Board of Governors of the Federal Reserve System International Finance Discussion Papers, No 791 (April).

[18] See, e.g. Pain N, I Koske and M Sollie (2006), "Globalisation and inflation in the OECD economies," OECD Economics Department Working Paper No. 52. They calculate that if the GDP of the non-OECD countries during the period 2000- 2005 had grown at the slower pace of the OECD countries then the world real oil price would have been up to 40% lower by the end of 2005.

Wages

Turning briefly to recent euro area wage developments, globalisation may have been one contributing factor to an extended period of wage moderation within the euro area (for instance, through offshoring or the threat of offshoring), across both manufacturing and service sector. While productivity growth in the euro area has also been moderate over the last decade, real wage growth has also been low. Over 1985-1995 both productivity (output per person) and real wage growth rates averaged around 1.9%. Over the period 1996-2006, average productivity growth was approximately 1%, with average real wage growth around 0.4%.

While such a development might be taken to be related to a necessary moderation in a period of persistent high level of unemployment and to an additional moderation driven by globalisation, extreme caution should be made in drawing such conclusions as regards globalisation, given several caveats related to measurement issues and the fact that much of the associated decline in the wage share took place well before the recent phase of globalisation.[19] An increase in the real wage elasticity of labour demand appears to have occurred in the last years, particularly for low-skilled workers, which may signal a trend fostered by additional supply of low-skilled labour at a global level.[20] Moreover, in addition to observable factors, an unobservable "threat effect" – whereby workers in industrialised economies perceive themselves to have a weaker position and thereby moderate wage claims given a fear of production relocation to lower-cost economies– may have contributed to wage moderation.

But in the euro area it appears that wage moderation since the setting up of the euro has been a very powerful response to the level of mass unemployment that characterized Europe in the 90's. The wage moderation has been at the root of the remarkable employment success of the euro area with 15 million new net jobs created in nine years, 2 million more than in the U.S. during the same period.

Overall impact on producer and consumer prices

The recent euro area experience thus indicates that relative price impacts have been strong over the last decade, with disinflation in manufactured goods contrasting with a strong acceleration in prices for commodities, though a complete assessment of their importance relative to historical norms is hampered by limited past data. As shown in Chart 6a, producer price inflation has shown strong relative price effects, with muted development in consumer goods excluding food and tobacco (-1.0 % on average over the period 1996-2006 compared with the overall index) along with capital goods (-1.3 % on average) relative to average producer prices contrasting with a relatively strong rise (+2.5 % on average) in the energy component (which also may have also affected prices further down the production chain). As shown in Chart 6b, HICP subcomponents have also exhibited sizeable price differentials, in particular with three energy-related items displaying the highest increases over 1996-2006 (between +5.5 % and +7.5 %), while three ICT-intensive internationally traded goods exhibit the lowest increases (between -5 % and -14 %) over the period.

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[19] Trade theory would suggest that enhanced trade between developed and developing countries places downward pressure on the relative returns to unskilled workers – whereby the relative real return to the factor used intensively in the production of a good whose relative price falls/rises should also fall/rise according to the Stolper-Samuelson proposition. However, real wage developments have remained similar across all skill groups in the euro area; see further details in ECB (2008), "*Globalisation, trade and the euro area macroeconomy*," Monthly Bulletin, January.

[20] See, e.g. Pula G. and F. Skudelny (2007), "The impact of rising imports from low-cost countries on euro area prices and labour markets: Some preliminary findings," Paper presented at ECB conference "Globalisation and the macroeconomy", July; Molnar M., N. Pain and D. Taglioni (2006), "The internationalisation of production, international outsourcing and OECD labour markets," OECD Economics Department Working Papers 561.

Overall, numerous estimates suggest a small net dampening impact of globalisation on euro area inflation of 0-0.3 percentage point per annum over the last 5-10 years when taking into account the net impact of disinflationary effects of increased trade openness in the manufacturing sector and strong commodity price increases. On the basis of several accounting methodologies, including aggregate and sectoral analysis, ECB research finds a direct dampening effect of import openness on euro area producer price inflation of 0.1-1.0 percentage point per annum for the manufacturing sector over the period 1996 to 2004.[21] Likewise, aggregate data shows a dampening impact on euro area consumer price inflation of 0.05-0.2 percentage point per year on average.[22]

The outlook: upside risks to inflation related to globalisation

Overall, while the empirical evidence would lend support to the idea of a favorable relative price shock associated with globalisation, there have been recently signals that the disinflationary impact of low-cost countries on euro area import prices might be coming to an end due to increasing inflationary pressures in those countries. At face value, the recent increases in the prices of import from low-cost countries might be interpreted as a sign that the downward impact from these countries is waning. Moreover, from a forward looking perspective, price pressures on soft commodities (such as food) induced by globalisation forces – following pressures already witnessed on hard commodities – appear to be a potential source of strong adverse relative price shocks. These developments clearly represent upside risks to price stability.

A first, distinct threat to price stability associated with globalisation comes from the fact that global food prices have risen significantly in 2007.[23] This is the result of a number of factors, such as increases in energy and fertiliser prices, adverse weather conditions in some regions, greater demand for foodstuff resulting from the changes in food consumption patterns in many developing economies, and from the emergence of new sources of demand for some agricultural commodities, for example for the production of biofuels. As these latter developments are of a structural nature, they are likely to have a more persistent upward impact on global food prices in the future.

The rise in global food prices has led to notable increases in food prices in the euro area, at both the producer and the consumer level. The producer prices of food products and beverages rose by 8.6% in annual terms in December, compared with a rate of 2.2% on average in 2006. At the consumer level, the annual rate of change in HICP processed food excluding tobacco rose to 5.6% in December, up from 1.6% in 2006.

Further ahead, the outlook for both world and domestic food prices remains uncertain. Although the supply of agricultural products should eventually respond to the increase in demand, the catch-up period may be more prolonged than currently envisaged. Moreover, food price developments depend on a number of factors which are difficult to predict, including technology advances and possible changes in energy policy. Hence, risks in the medium term seem to be on the upside.

Against the background of a marked increase in international food commodity prices, I will remind that further liberalisation and reforms in the EU agricultural markets are particularly

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[21] See Pula and Skudelny (2007).

[22] Pain et al. (2006) find a combined effect on consumer inflation from lower noncommodity import price inflation and higher commodity import price inflation of up to 0.3 percentage point per annum over the period 2000-05. Using similar methodologies, Chen et al. (2007), and Helbling T., F. Jaumotte and M. Sommer (2006), "How has globalisation affected inflation?," *IMF World Economic Outlook*, Chapter 3 (April), report findings of a similar magnitude for other countries and regional groupings. However, for some caveats on these accounting methodologies see Ball, L. (2006), "Has globalisation changed inflation?" NBER Working Paper No. 12687.

[23] See ECB (2007), Monthly Bulletin, December.

important. Reforms would help to enhance market efficiency and benefit European consumers in the form of lower prices. In order to allow consumers to profit from lower farm-gate prices, adequate competition in the downstream sectors (food processing, retail trade and catering) and compliance with Single Market provisions are necessary. The successful conclusion of the Doha round of world trade negotiations should also help to improve the functioning of global trade in general, and of agricultural markets in Europe and worldwide in particular.

Turning to risks of inflationary pressures from emerging economies, currently, some limited inflationary pressures appear to be originating from NMS (Chart 7). These recent import price increases primarily reflect the lagged impact of higher energy and raw materials prices which have pushed up the prices of virtually all euro area import suppliers.

However, while the share of the NMS economies in euro area imports is rather significant, at around 11%, the relatively limited increases in their export prices – actual and expected – are unlikely to make them a significant source of imported inflation in the euro area.

Turning to China and India, a noteworthy feature of both countries is the significant upturn in inflationary pressures recently. In China, food prices have been by far the main contributor to this recent rise in CPI inflation, whereas non-food prices have remained remarkably stable.

On the one hand, an upside risk is that, admittedly, higher domestic inflation could feed into wages and, eventually, export prices. On the other hand, ongoing and expected developments in domestic prices and costs in the NMS as well as in China and India suggest that potential risks to inflation originating from these two regions are relatively contained.[24]

Nevertheless, economic development, robust wage increases and terms of trade deterioration in low-cost countries, as well as increasing sophistication, variety and technological content of exports would suggest that low-cost countries are making a leap-up in the value chain and that their export bundles are becoming increasingly similar to the more advanced western economies, which will ultimately lead in the long-run to a convergence of their export prices to higher international levels.

Monetary policy implications of terms of trade shocks

To what extent are these developments relevant for the conduct of monetary policy in the euro area? The European Central Bank's mandate is to maintain price stability over the medium term, and price stability is defined as a rate of increase in the Harmonised Index of Consumer Prices for the euro area below and close to 2 percent. Hence, developments in external prices are relevant for the monetary policy of the ECB to the extent that they have an influence on medium term deviations from price stability.

What are the potential risks to price stability in the medium term coming from globalisation?

Before addressing these issues and drawing some lessons for monetary policy on the basis of the euro area experience, let me first reiterate that reports of the death of the effectiveness of monetary policy in a more globalised world, have been greatly exaggerated. Contrary to 16th century Europe, individual central banks are able, given flexible exchange rates, to define their medium and long run definition of price stability.[25] Moreover, as far as usual arbitrage considerations still apply, long-term interest rate determination continues to be

[24] See ECB (2008).

[25] See, e.g., Woodford (2007), "Globalization and Monetary Control," NBER Working Paper No. 13329, to appear in Galí, J. and M. Gertler eds., *The international dimensions of monetary policy*, University of Chicago Press.

closely related to the present discounted value of future expected short-term rates, thus giving a prominent role to central bank credibility and communication.[26]

Given that inflation is ultimately a monetary phenomenon even in a globalised world, theories asserting that China is exporting deflation or inflation should be viewed as overly simplistic. Globalisation forces materialise as external shocks, which should in principle affect relative prices, rather than the overall inflation rate in the long run. However, as is often the case in economics, matters become particularly complex when we move to analyse higher frequencies. In the medium run, whether terms-of-trade developments – like increases in oil and commodity prices or cheaper imports – exert positive or negative pressure on inflation will depend on their net effect on aggregate demand and aggregate supply. Soaring import prices will in fact tend to produce two competing effects.

The first effect, which can be denoted as supply effect, derives from the lower potential output growth associated with an adverse terms-of-trade shock, for instance brought about by an exogenous increase in the prices of oil or other commodities which are used as intermediate input in domestic production.[27] Thus, for a given level of aggregate demand, the fall in potential output will tend to be such that actual output exceeds potential, leading to a positive output gap and upward pressure on inflation.

There is a widespread perception that commodity prices affect inflation also through demand effects. By impinging on individuals' wealth, due to the impact of higher relative prices on current and expected future income, commodity price shocks may trigger a reduction in the demand for goods and services. For given potential output growth, the wealth effect would give rise to excess aggregate supply, thereby leading to downward pressure on domestic inflation.

Whether inflation tends to increase or fall in response to an adverse terms-of-trade shock will therefore depend on which of these two effects dominates. In theory, there is no general result. The net effect will also depend on specific features of the shock, e.g. whether it reflects exogenous shifts in the commodities supply or a buoyant global demand for them, and of its transmission throughout the economy. The wealth effect will dominate when aggregate demand reacts quickly. This may be the case, for example, when relative price developments are perceived to be very persistent, or permanent. Conversely, supply effects will tend to dominate when aggregate demand adjusts more slowly. The wealth effect should also be small, thus contributing to building inflationary pressures,[28]

Another important distinction, particularly in the present juncture, concerns the ultimate causes of terms of trade shocks, as they can reflect either commodity-specific or more aggregate factors. For instance, from the point of view of large economies like the euro area or the United States, an oil price increase fuelled by Chinese demand is not the same as one fuelled by a supply disruption. The factors underlying increases in Chinese demand for oil can also affect global inflationary pressures in a way that oil supply disruptions need not, for instance if they stem from favorable supply shocks augmenting global potential output. The

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[26] Bernanke, B. S. (2007), "Globalization and Monetary Policy," Remarks at the Fourth Economic Summit, Stanford Institute for Economic Policy Research, Stanford, California, 2 March.

[27] Under standard assumptions, imported commodities enter the production function of domestic gross output, but not the production function of domestic value added (see, e.g., Rotemberg, J. and M. Woodford (1996), "Imperfect Competition and the Effects of Energy Price Increases on Economic Activity," *Journal of Money, Credit and Banking* Vol. 28, No. 4, Part 1, pp. 549-577).

[28] See Blanchard, O.J., and J. Galí (2007), "The Macroeconomic Effects of Oil Shocks: Why are the 2000s so Different from the 1970s?" NBER Working Paper No. 13368, to appear in Galí, J. and M. Gertler eds., *The international dimensions of monetary policy*, University of Chicago Press.

global disinflationary effects associated with a Chinese increase of supply of goods may then counteract the adverse effects of the associated oil price increases.[29]

But, in any case, whatever effect dominates, either supply or demand, both might be dwarfed if "nominal second round effects" start to appear in case of a commodity price increase. The disanchoring of inflation expectations is threatening to become the dominant factor as soon as price setters and social partners are giving a permanent status to the otherwise transitory price increases.

Some implications for the ECB's definition of price stability

The medium-term orientation of the ECB monetary policy strategy ensures that the Governing Council duly discounts short-term price volatility in its deliberations.

Our medium-term orientation is supported by recent research in monetary economics. On the one hand, there is a substantial theoretical literature on the optimal response of monetary policy to inflation. On efficiency grounds the best way to absorb relative price shocks is to let more flexible prices – like those of commodities and oil – bear the brunt of the downward or upward adjustment, while stabilizing more inflexible prices and wages, and preventing inflationary pressures to materialize owing to possible second round effects.[30] On the other hand, the transmission lags of monetary policy decisions to prices (as indicated also by recent research on monetary transmission that the ECB has conducted with the National Central Banks) are long and variable, thus strongly advocating against any attempt to fine tune short-run price developments.

In light of this, some observers have argued that, since terms of trade shocks often contaminate standard price measures, central banks should put more emphasis on measures of so-called "core" or "underlying" inflation, or even specify their objective in terms of a measure of core inflation.[31] These measures, it was argued, could help avoid the risk of monetary policy-makers focusing excessively on temporary price fluctuations unrelated to fundamental price trends.[32] Our medium term orientation precisely allow us to look through temporary price fluctuations and to assess risks to price stability in a forward looking manner. In addition, it overcomes several technical difficulties associated with the definition and the measurement of "core inflation". First, it is difficult to discriminate between alternative measures of underlying inflation, which typically diverge to a significant extent. Second, it is challenging to agree on a satisfying ex-ante definition of core inflation, because of the high degree of uncertainty surrounding the nature of future shocks. Third, measures of core inflation do not necessarily have good leading indicator properties.

ECB research has in particular shown that for the euro area standard measures of core inflation, excluding energy and unprocessed food prices, do not have desirable leading

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29 Rotemberg, J. (2007), "Comment," to appear in Galí, J. and M. Gertler eds., *The international dimensions of monetary policy*, University of Chicago Press.

30 See, among others, Clarida, R., J. Galí, and M. Gertler (2003), "A simple framework for international policy analysis," *Journal of Monetary Economics* 49, 879-904; Corsetti, G. and P. Pesenti (2005), "International dimension of optimal monetary policy," *Journal of Monetary Economics* 52, 281-305; Corsetti, G., L. Dedola and S. Leduc (2007), "Optimal monetary policy and the sources of local-currency price stability," NBER Working Paper No. 13544, to appear in Galí, J. and M. Gertler eds., *The international dimensions of monetary policy*, University of Chicago Press.

31 See among others, D. Gros, J. Jimeno, C. Monticelli, G. Tabellini and N. Thygesen (2001), "Testing the speed limit for Europe," 3rd report of the CEPS Macroeconomic Policy Group; and A. Alesina, O. Blanchard, J. Galí, F. Giavazzi and H. Uhlig (2001), "Defining a macroeconomic framework for the euro area," Monitoring the ECB 3, CEPR, London.

32 See ECB (2001), "Measures of underlying inflation in the euro area," ECB *Monthly Bulletin*, pp. 49-59.

indicator properties.[33] This implies that volatile, flexible prices like those of energy and commodities are very useful and should instead be included in the broad index monitored by the central bank, as they could provide a timely signal of inflationary pressures, arising not only in their specific markets, but more generally in the overall economy.

Most importantly, a clear and transparent definition of price stability contributes to a firm anchoring of inflation expectations. In the absence of such definition, a sequence of adverse inflationary shocks could be misinterpreted by private agents as a shift in the objective of the central bank, thereby unmooring inflation expectations and eventually leading to second round effects. A definition of price stability in terms of headline CPI inflation provides a clear and measurable yardstick against which the central bank could be held accountable and guidance for forming expectations of medium-term price developments.[34] At the same time various measures of "underlying inflation" are analysed as *indicator* variables in the context of our regular and comprehensive assessment of risks to price stability, as this may help, on occasion, in assessing longer-term price dynamics.

Closing remarks

How can monetary policy maintain and consolidate the current gains in terms of a low and stable inflation environment, while contributing in reaping the benefits from the process of globalisation? Against the backdrop of a rapidly evolving world economy, monetary policy needs to be firmly geared to maintaining price stability over the medium-term, pinning down trend inflation. A forward-looking policy stance is thus most appropriate, which closely monitors the ramifications of globalisation for inflation, looking through temporary changes, being constantly alert and remaining firmly committed to preventing second round effects.

I thank you for your attention.

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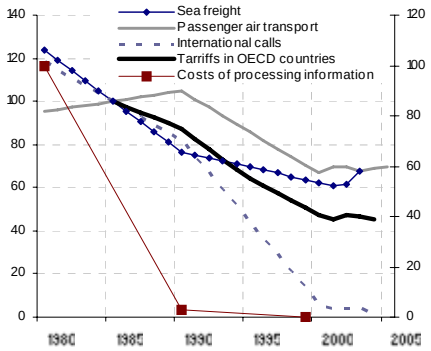
[33] See Cristadoro R., Forni M., Reichlin L. and G. Veronese (2005), "A Core Inflation Index for the Euro Area," *Journal of Money, Credit and Banking* Vol. 37(3), pp. 539-560; and Lenza, M. (2006), "HICP and Core Inflation in the Euro Area," ECB, mimeo.

[34] For the purpose of setting a quantitative objective for monetary policy, a price index should embody a number of essential properties. These include the credibility of the index as perceived by the general public, a high level of reliability (e.g. revisions should be infrequent), and the availability of the index with sufficient timeliness and frequency. See Camba-Mendez, G. (2003), "The definition of price stability: Choosing a price measure," in ECB, *Background studies for the ECB's evaluation of its monetary policy strategy*.

Chart 1:
Costs of transport, information processing costs, and tariffs

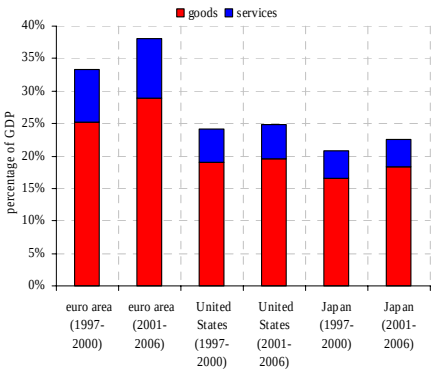
(Index, 1985-100)



Source: OECD.

Note: Tariffs are median of national mean bound tariffs for OECD countries, Sea freight is average international freight charges per tonne, passenger air transport is average airline revenue per passenger mile/US import air passenger fares; international calls is cost of a three-minute call from New York to London, costs of processing information is cost of computing an average operation (sum and multiplication).

Chart 2a:
Openness of the euro area, the United States and Japan

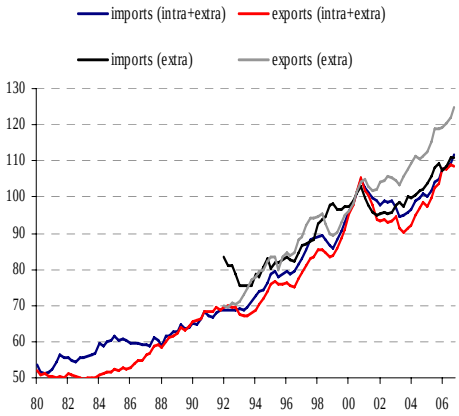


Source: ECB calculations.

Note: The degree of openness is measured as exports plus imports as a percentage of GDP, average 1997-2006. Euro area based on extra euro area trade.

Chart 2b:
Total and extra-euro area imports and exports divided by GDP

(quarterly data; indices; 2000=100; volumes)



Source: ECB calculations.

Chart 3:
Inward capital flows in the OECD countries

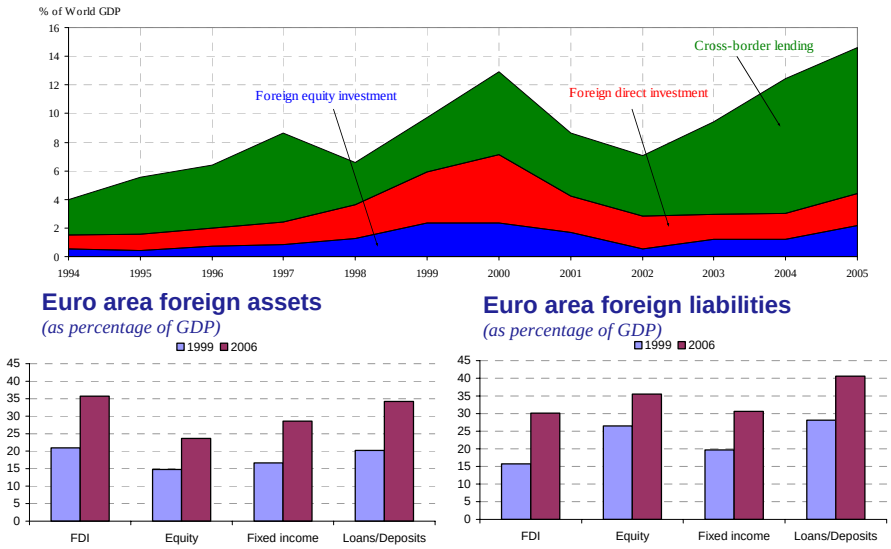
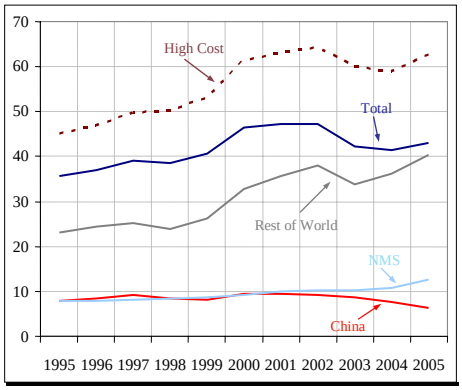


Chart 4a:
China and NMS have lower import price level

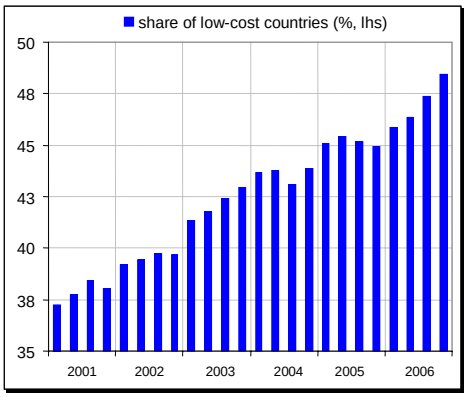
(euros per kg of EA manufacturing imports)



Source: Eurostat Comext data and ECB staff calculations.
Note: Latest observation refers to 2005.

Chart 4b:
Rising share of low-cost countries in euro area imports

(values in euro; % of extra-EA imports)



Source: Eurostat, ECB staff calculations
Note: Latest observation refers to Q4 2006. Low-cost countries consists of 15 countries and regions (including ASEAN, NMS, CIS, China, India, etc).

Table 1
Impact of low-cost countries on extra-EA manuf. import prices
Decomposition of low-cost effect

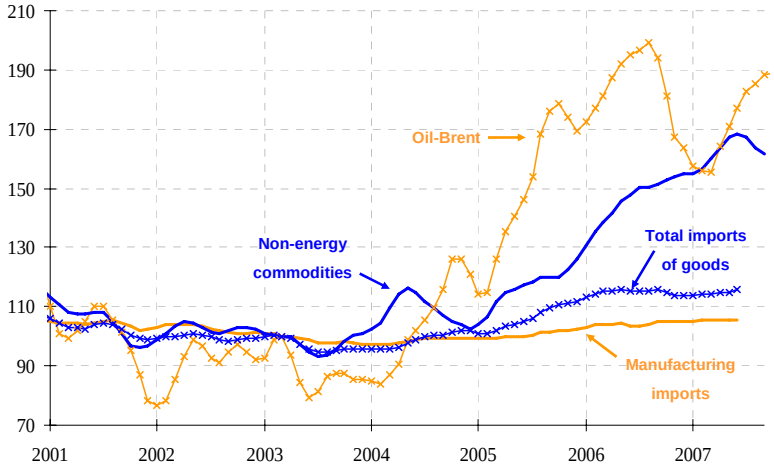
(annual average 1996-2004, percentage points unless otherwise indicated)

Low-cost effect (aggregate direct effect)	**-2.1**	
Share effect	**-1.6**	
Of which:		
China		-0.8
NMS		-0.7
Rest of low-cost		0.0
Price effect	**-0.5**	
Of which:		
China		-0.2
NMS		-0.2
Rest of low-cost		-0.1

Sources: ECB staff calculations.

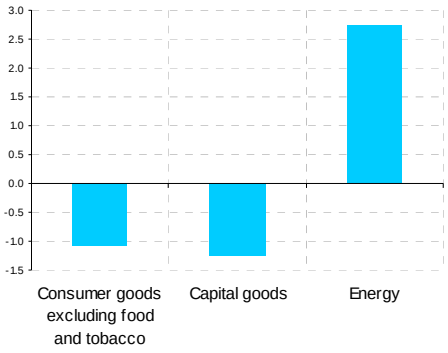
Note: "Share effect" captures the impact of rising import share and relatively low price level of low cost import suppliers (1.6 pp per annum); "price effect" captures impact of relatively lower import price inflation of low cost countries (0.5 pp per annum).

Chart 5
Extra-euro area import and commodity prices
(indices: 2003M1=100, 3-month moving avg.)



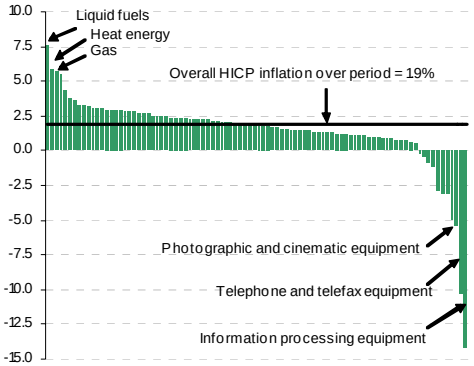
Sources: ECB, HWWA and Eurostat.
Note: Last observation relates to dates from July 2007 to September 2007. All prices are in euro.

Chart 6a:
Producer prices: Evolution of selected sub-indices relative to overall index
(Difference between annualised growth rate over 1996-2006 in component relative to overall index, %)



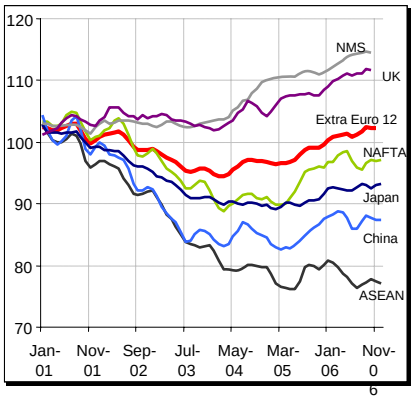
Source: ECB calculations based on Eurostat data.

Chart 6b:
Consumer prices: average price changes in euro area HICP subcomponents
(average annual change over 1996-2006, %)



Source: ECB calculations based on Eurostat data.
Note: Data for 92 HICP subcomponents.

Chart 7
Recent developments in extra-EA manuf. import prices by import supplier
(monthly data, unit value indices, 3MMA, Euro)



Sources: ECB, HWWA and Eurostat.
Note: Last observation relates to dates ranging from Nov. 2006 to March 2007.