

Bräuninger, Michael; Vöpel, Henning

Article — Published Version

Globalisation, trade, and growth: A macroeconomic perspective

Intereconomics

Suggested Citation: Bräuninger, Michael; Vöpel, Henning (2009) : Globalisation, trade, and growth: A macroeconomic perspective, Intereconomics, ISSN 1613-964X, Springer, Heidelberg, Vol. 44, Iss. 3, pp. 185-192,
<https://doi.org/10.1007/s10272-009-0293-z>

This Version is available at:

<https://hdl.handle.net/10419/66157>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Michael Bräuninger and Henning Vöpel*

Globalisation, Trade, and Growth: A Macroeconomic Perspective

On the basis of economic theory, what effects can globalisation be expected to have on trade and growth? Does the empirical evidence support this? What developments will the next phase of globalisation bring?

By “globalisation” economists specifically mean the increasing trade liberalisation between nations and the rising degree of openness of national economies which have occurred in the last decades. In a more general use a variety of different economic, social and political processes and developments are subsumed under the term “globalisation”. In many economies, benefits from specialisation and trade advantages have arisen as a result of this process. Due to different factor endowments and production possibilities, national economies produce a variety of goods at different relative costs. The exchange of these goods can be beneficial to both of the participating economies (trade advantage). Furthermore, economies can also specialise in the production of the goods for which they have a comparative production advantage (specialisation advantage). Both effects lead to a higher level of overall welfare. However, there are winners and losers when it comes to globalisation. According to the Samuelson-Stolper Theory, with its given factor endowments an economy specialises in the production of those goods that require for their manufacture the factors which the country possesses in relative abundance. Economies with comparatively high capital resources specialise in capital-intensive goods, those with comparatively high labour resources in labour-intensive goods. This has implications for the functional distribution of income: in the country that specialises in capital-intensive goods, capital income will increase and labour income will decrease; in the land where the labour-intensive goods are produced, labour income will rise and capital income will fall. Similar effects result for high and low-skilled workers. Here, a reallocation of the factors of production due to globalisation can likewise cause a redistribution of factor income. In the industrialised nations, high-skilled workers, relatively strongly represented in these countries, also profit from migration movements, while low-skilled

workers are poorly positioned. It has often been said that lower social standards have resulted due to a mix of these processes and a competition-induced “race to the bottom”. Indeed, workers in emerging nations are more willing to accept lower wages and social security than in the industrialised countries. But this “race to the bottom” is less a consequence of globalisation than a catching-up process for developing and emerging countries. As soon as a higher income level has been reached, social standards will increase and the costs of adjusting will increasingly move from the industrial nations to the others.

With increasingly deregulated capital markets and with exchange-rate regimes turning from fixed to more flexible rates, capital flows have become more and more global, leading to a marked increase in capital mobility. Cross-border capital movements have significantly increased in importance, by far surpassing the value of commodities trade. It has often been suggested that this is proof of the dominance of the capital markets over the commodities markets, destabilising them. In fact, however, it is not only trade in commodities that is being mirrored on the international capital and foreign-exchange markets, but expectations and risk are also being dealt with. Capital has moved especially to regions where there was little, and so generated high yields. Above all, this has happened in the so-called emerging markets. The process not only affects the level and direction of net capital flows, but also the total amount of worldwide capital movements.

To a certain extent, contrary to the capital exports to the emerging markets, there has been a slow-down in the increase of capital stocks in the industrial countries. In the euro zone, the average annual growth rate for capital stocks slowed from 4.8% during the period 1960 to 1974 to 2.3% between 1980 and 2003 (cf. Table 1). Moreover, not only the growth rate of gross domestic product, but also the contribution to growth by capital was significantly higher in

* Hamburg Institute of International Economics (HWWI), Hamburg, Germany.

Table 1
Average Annual Growth Rate for Gross Domestic Product and the Input Factors

	(in %)				
	1960 - 2003	structural breaks	before structural breaks	between	after structural breaks
real GDP	3.1	1973	5.1	-	2.2
TFP	1.6	1973	3.2	-	1
labour input	0.5	-	-	-	-
capital input	3.2	1974, 1980	4.8	3.3	2.3

Source: European Central Bank: Assessing Potential Output Growth in the Euro Area. A Growth Accounting Perspective, in: Occasional Paper Series, No. 22, 2005.

eastern Europe than in “old” Europe in the past decade.¹ The same applies to technological advancement, which is measured as an increase in the “Total Factor Productivity” (TFP).

It can be shown that free capital flows lead to an increase in welfare even though capital accumulation, and therefore growth, in industrial countries declines in the course of the opening for capital movements.

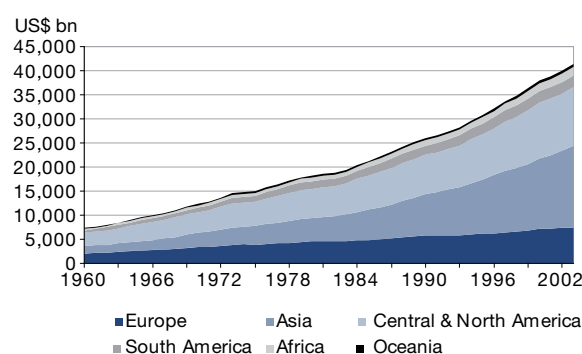
Capital is most productive in places where it is scarcest. Such places are where the available capital per head of workforce is at its lowest. Capital flows from outside into a country after the opening of the border for capital mobility. In the process, interest rates fall abroad while they rise domestically. This process continues until the domestic interest rates match the interest rates abroad. As can be shown a net welfare increase arises for both countries.

Developments and Perspectives of Globalisation

World production has increased by about six times since 1960 (cf. Figure 1). Asia in particular has registered high growth. The reasons for this dynamic development are diverse and, to a great extent, interdependent. On the one hand, developing and emerging countries are demonstrating a more significant catch-up process compared to industrialised countries. This is strengthened through trade and specialisation advantage as a result of increasing trade liberalisation and the opening of economies. Technological advances arise and are spread faster due to free capital flows and new information technologies. The high economic growth in Asia is due to high domestic savings and capital imports, which led to high capital accumulation. This development was interrupted temporarily when the Asian crisis

¹ M. C. Burda, B. Severgnini: TFP Growth in Old and New Europe, Working Paper, 2008.

Figure 1
Development of World Production in Real Terms



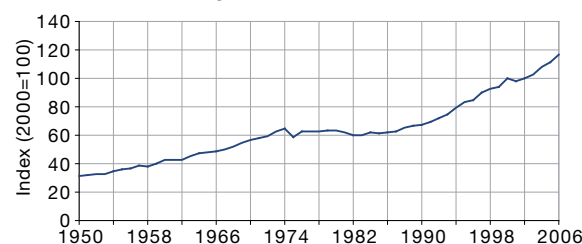
Source: A. Heston, R. Summers, B. Aten: Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

hit in 1997. The crisis was caused by scarce foreign currency reserves, fixed exchange rates and a weak domestic banking system. After steps towards monetary and currency policy stability were undertaken, the dynamic growth process was resumed again, continuing at a nearly unchanged rate.

On the one hand, the similarly strongly increasing rate of international trade can be seen as a result, partly also as a cause, of world economic expansion. Besides structural adjustments, economic growth of given regions is a central determinant of the trade between those regions. And so, analogous to the strongly rising world economic production since the 1990s, world trade has also increased; it has nearly doubled since 1985 (cf. Figure 2).

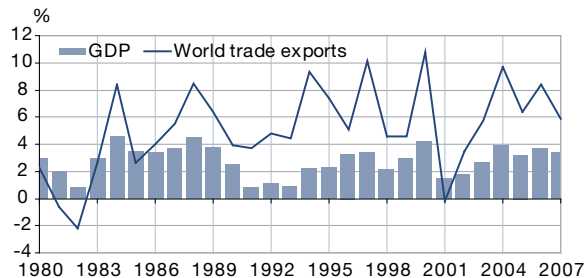
In addition to the growth-driven effect on trade since 1985, trade liberalisation and the opening of many economies have led to a structural change. In so doing, they overlay and strengthen each other. This is why the growth rate of world trade is, as a rule, higher than the growth rate of world production (cf. Figure 3). However, it is important to note that

Figure 2
Development of World Trade



Source: IMF: Onlinedatabank, 2009.

Figure 3
Growth Rates of World Trade and World Production



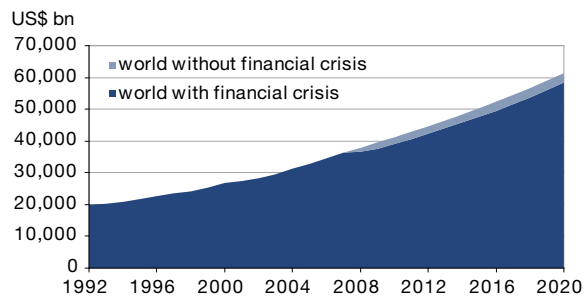
Source: IMF: Onlinedatabank, 2009.

world trade shows more volatility than production. World trade falls more than production in crises, but also recovers more quickly and is able to grow at a disproportionately high rate in boom-times.

According to the HWWI forecast, the bilateral trade between the regions will continue to increase strongly until 2030 (cf. Table 2). The trade outlook is based on the growth forecast for the region as well as its trade structure as the most important determinants for bilateral trade. Due to the strong growth in the region, trade with Asia will see the highest growth rates in all regions.

The current financial and economic crisis will not fundamentally change this forecast. Although a deep, but temporary, slump in world economic expansion will take place, in the long term the most important economies are expected to return to the "old" growth trend. A simulation of the current financial and economic crisis has shown that, although this temporary setback in growth will create a "plateau" effect (a slight one, in the long term), world economic expansion will resume at about the same level. Figure 4 shows a simulation in which it is assumed that the growth rate for world production in 2009 and 2010 shrinks by 3.5 and 2.0 percentage points respec-

Figure 4
Expansion Trend With and Without Financial Crisis
(in US\$ bn)



Assumptions: Growth Rate: 4.1% p.a.; with Financial Crisis: -3.5 percentage points in 2009 and -2.0 in 2010.

Source: HWWI Calculations.

tively. Then the growth of world production resumes at a rate of 4.1%. This rate represents the average rate since 2000. Obviously, this simulation presents a very stylised and simplified picture of the current financial and economic crisis. The actual development will certainly differ from that which is assumed here. The actual development is dependent upon how the crisis is dealt with in the various regions of the world. There is reason to believe that the industrialised nations will suffer from this crisis much longer than the two years assumed here. As a result, the growth rate would be below the long-term average for a longer time. On the other hand, past crises have shown that catch-up processes have accelerated growth afterwards. As long as this was the case, the long-term growth trend would be reached sooner. A meaningful interpretation of Figure 4 is, however, that growth interrupted for two or three years is relatively insignificant for development over decades.

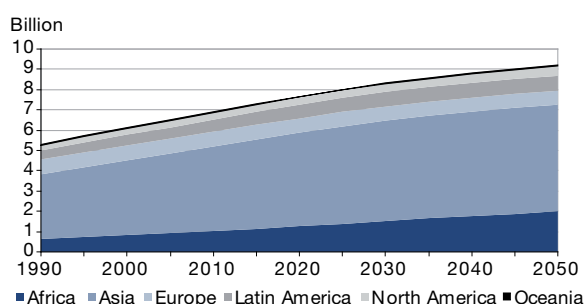
The future growth trend on both the supply side and the demand side will be determined by demographic development. Population growth drives the development of demand, the need for infrastructure

Table 2
Bilateral Trade Growth per Annum until 2030

%	Latin America	South Asia	East Asia & Pacific	Sub-Sahara	Near East & North Africa	Transformation countries	Industrialised countries
Latin America	8.5	9.7	10.5	8.7	8.0	8.1	7.2
South Asia		10.9	11.8	9.9	9.2	9.3	8.4
East Asia & Pacific			12.6	10.7	10.1	10.1	9.2
Sub - Sahara				8.9	8.2	8.3	7.4
Near East & North Africa					7.6	7.6	6.7
Transformation countries						7.7	6.8
Industrialised countries							5.7

Source: HWWI: Maritime Wirtschaft und Transportlogistik, Hamburg, 2006.

Figure 5
Growth of World Population by Region



Source: UN Data: World Population Projection: The 2006 Revision, Abfrage im Internet 2009.

and the supply of labour. Figure 5 shows the world population growth according to the UN forecast, which predicts that the world population will increase to more than nine billion by 2050.

Alongside population, technological progress and investment in physical and human capital are the driving forces for growth. These lead to an increase in productivity and so to higher per capita income in the future. Innovation and growth will primarily be driven by science and research-intensive industries in future.² Nanotechnology, biotechnology and genetic engineering could provide basis innovation, which leads to boosts in growth, particularly in the fields of climate, energy and health as well as mobility, transport and logistics. Simultaneously, a high potential for demand arises in precisely these fields in the light of population growth and increasing per capita income.

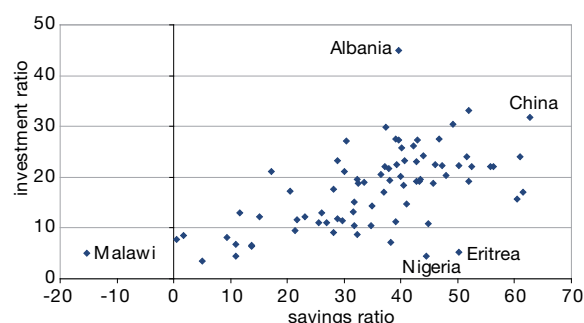
Savings, Investment and Growth

Goods, capital and asset markets are directly related. Income can be either saved or spent. Savings signify wealth accumulation. Individually, wealth accumulation can take the form of higher real capital stocks or monetary assets. However, economy-wide wealth accumulation can take place only with investment or with capital exports abroad. In this way the investments increase the capital stock, and capital export increases the net current account position towards other countries. In the past, considerable amounts of tangible assets as well as monetary assets were accumulated in Germany (cf. Table 3).

Domestic production capacity is increased through the expansion of capital stocks and capital

² For the endogenous growth theory, see e. g. R. J. Barro, X. Sala-i-Martin: Economic Growth, New York 1995.

Figure 6
Savings Ratio and Investment Ratio



Source: A. Heston, R. Summers, B. Aten: Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

income arises from foreign assets. The accumulation of foreign assets means that domestic wealth accumulation surpasses capital accumulation. By contrast, foreign investment may be higher than the local savings. With perfect capital mobility the rate of investment would be independent of the rate of savings (cf. Figure 6).

Whether wealth is kept in real or in financial capital is a portfolio decision, with due consideration of individual preferences concerning yield, risk, liquidity provision and investment horizon. Economically,

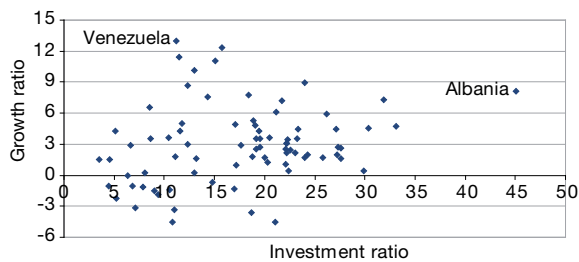
Table 3
Wealth Accumulation in Germany
(in billion euro)

	2003	2004	2005	2006	2007
Wealth creation					
real capital accumulation	53.39	49.41	47.78	72.96	97.29
private households	37.39	33.77	30.92	37.04	46.29
non-financial companies	19.93	23.21	26.12	43.25	56.57
government	-2.79	-5.38	-6.54	-5.1	-3.48
financial sector	-1.14	-2.19	-2.72	-2.23	-2.09
Net credit to the rest of the world	44.76	98.51	105.76	121.8	167.59
Total	98.15	147.92	153.54	194.76	264.88
Savings					
private households	162.4	167.17	174.62	175.84	179.79
non-financial companies	9.75	43.08	40.06	43.81	70.1
government	-90.07	-88.94	-82.11	-42.36	-3.25
financial sector	15.98	26.61	20.97	17.47	18.24
Total	98.15	147.92	153.54	194.76	264.88
Net monetary asset accumulation ¹	44.76	98.51	105.76	121.8	167.59

¹ Identical with net credit to the rest of the world.

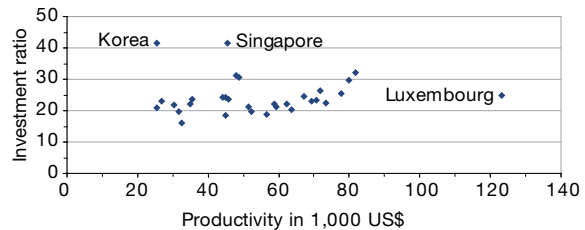
Source: Bundesbank: Ergebnisse der Gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 1991 bis 2007, in: Statistische Sonderveröffentlichung 4, Frankfurt a.M. 2008.

Figure 7
Investment Ratio and Growth Rate



Source: A. Heston, R. Summers, B. Aten: Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

Figure 8
Investment Ratio and Productivity



Source: IMF: Onlinedatabank, 2009; A. Heston, R. Summers, B. Aten: Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

a close substitution relationship arises between the two investment types: portfolio adjustment takes place until the yields have equalised. Nevertheless, several asset markets are segmented by certain characteristics, so that an outright equalisation of the yields never occurs. In particular, the expectations that private and institutional investors have about inflation, economic cycles and long-term developments in individual sectors can be very heterogeneous. For an open economy, it holds that the level of domestic investment represents the sum of the domestic savings and the net capital import (negative trade balance). Interest and yields on foreign capital can be seen as international transfer payments. Labour productivity grows as a result of increasing capital intensity, so that the overall welfare effect of a capital import is positive.

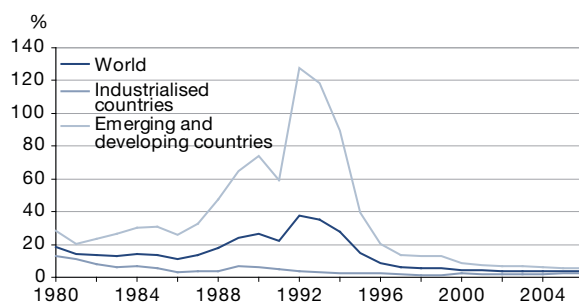
Higher rates of investment have two positive effects on growth. On the one hand the capital stock rises, whereby the production capacity increases. On the other hand investment implies a technical renewal of capital stocks. An increase of per capita income can be achieved through higher capital intensity and technological advancement. In the process, technological advancement can be linked to new capital (capital-embodied technical progress), tied to labour (increase of efficiency) or take the form of increased overall factor productivity. The “ultimate” sources of higher per capita income are higher capital intensity and technological advancement. An economy can invest in both of them. Within the framework of endogenous growth theory, the “production” of technological advancement is determined by learning and investment in research and development.

Globalisation has far-reaching implications for international capital flows and investor behaviour. The Intereconomics, May/June 2009

opportunities for temporal and spatial risk diversification and the term transformation between savers and investors have been raised through worldwide economic integration and the increasing size of capital markets. The worldwide integration can, however – as in the current financial crisis – lead to more intransparency, increased contagiousness and systemic risk, and the destabilisation of capital and goods markets. Economic cycles synchronise and expectations reinforce one another. As a result, the danger of herd behaviour and the development of bubbles increases and distributing and diversifying risk over various phases of different business cycles might become more difficult. Over the long term, however, globalisation offers favourable prospects for the spatial and intertemporal allocation of capital. On top of this is a world economic environment characterised by high growth in developing and emerging nations. This offers new markets in the fields of climate, energy, and health, as well as transport and logistics. The financing of economic development and new technologies is of particular importance in this environment. It is not currently foreseeable to what extent this will lead to stronger regulation of international capital markets and financial transactions.

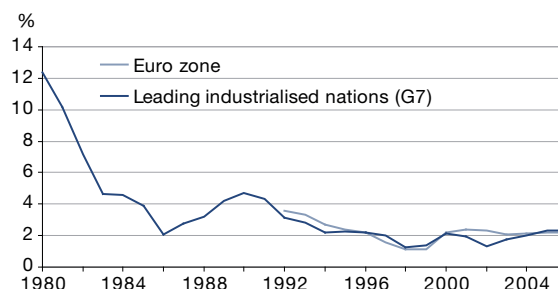
The “second phase” of globalisation will be less characterised by capital movements, outsourcing, technology transfer and growth convergence in developing and emerging nations, and more by even closer integration and synchronisation of production, trade and logistics. Global supply chains will be synchronised on a “just in time” basis and their logistics chains will be optimised. Additionally, stronger trade in services will occur, such as in the area of health care.

Figure 9
Development of Inflation Rates



Source: IMF: Onlinedatabank, 2009.

Figure 10
Development of Inflation Rates in Industrialised Countries



Source: IMF: Onlinedatabank, 2009.

Growth and Inflation

The growth trend of a national economy is determined by real and fundamental variables, such as capital accumulation, technology, and so forth. Monetary policy has, at best, short-term stabilising effects on production and employment during the business cycle. The “neutrality of money” applies here over the long term. In the long term, monetary policy cannot increase employment and production beyond the level established by potential growth. In this case, the monetary impetus merely acts upon price levels by way of the transmission channel of relative prices. Relative prices, and therefore the allocation decisions of economic actors, remain unchanged by monetary policy in the end, only the price level changes. An increased growth rate of money, then, leads to a higher rate of inflation.

The effects of inflation on growth, however, are ambiguous. In particular, very volatile rates of inflation may lead to a less accurate anticipation by the economic actors. In general, the higher the rates of inflation, the more volatile they are. In this case, high and volatile rates of inflation lead to changes in consumption and investment decisions. Investment behaviour changes as well. The attractiveness of nominal fixed values, such as demand deposits and government bonds, sinks when inflation rates are high and volatile. On the other hand, there is an increase in the attractiveness of tangible assets whose prices rise with inflation, so offering a kind of protection against unexpected inflation. Productive capital then tends to be more attractive, which can lead to more investment and increased growth. In any case, when inflation rates rise the attractiveness of saving is lowered, since savings often take the form of money, which loses value with inflation. Wealth and capital accumulation, and therefore growth poten-

tial, decrease in the process. If inflation is a result of a cyclical economic overheating, it will be increased even more.

The worldwide rates of inflation have retreated over recent decades. In developing and emerging economies, the reason for this often lies in increasing stability of monetary policy (cf. Figure 9). But in recent years the inflation rates in the industrialised countries of the G7 and the euro zone have also been lower and more stable than in the past (cf. Figure 10). The disciplining effect of monetary and exchange-rate policies can best be seen in the experiences of Italy and Greece, for example. Cost reductions as a result of the international division of labour have had a restraining effect on inflation. All in all, as a result of the lower and less-volatile worldwide rates of inflation, household and corporate investment and planning security has increased – with positive effects on growth.

Often, the fall of rates of inflation is attributed solely to increased monetary-political discipline. This is justified also by the use, by firmly stability-orientated central banks such as the Deutsche Bundesbank, of a money-supply target. Although a correlation between money-supply growth and inflation can be established,³ a causal relationship between the two variables is in no way certain. The money supply is not exogenously directed in parts by the central bank, but determined endogenously on the basis of an elastic banking system and through demand for money and credit, among other things. Added to this, complex motivations give rise to portfolio switching between money supply aggregates, which largely avoid monetary-political direction in the short term.

³ Cf. Deutsche Bundesbank: Monatsbericht, January 2005, Frankfurt a. M.

In this respect even the influence of money supply growth on inflation is insignificant. In addition, increasing labour and raw material costs, unrelated to money supply expansion, lead to rising commodity prices. For this reason, central banks have switched from money supply control to *inflation targeting*. The European Central Bank follows a two-pillar strategy that binds both aspects together.

Over the last decade, the rate of inflation in the USA has remained at a very moderate level, although the money supply in the USA has expanded drastically. The reason for the expansion was the struggle against the economic crisis in conjunction with the terrorist attacks of 11 September 2001. However, the expansion of the money supply was not ended as the economic situation improved. The fact that the commodity markets showed no inflation was critical for the monetary-political controls to remain uninvolved. Instead, the increased liquidity flowed into asset markets and, in so doing, contributed to the real estate bubble. It is clear that tangible assets offer some protection from increasing commodity prices, but are not protected from becoming part of a price bubble themselves. This has been very impressively demonstrated by the developments on the American housing market.

In the course of the current financial crisis, the worldwide money supply has been expanded to a great extent. In the beginning, this was to compensate for the idle interbank trade: because the banks were no longer making loans to one another, the central banks stepped in and made loans to the banks. In this respect, the central banks have only balanced the lower money multiplier and kept the liquidity provision for trade upright. This could become a problem if interbank trade resumes and the money multiplier rises again. If the central banks do not reverse their loan extension quickly and firmly, it will lead to a further significant expansion of the money supply.

The necessity of an about-face in monetary policy becomes even stronger when the economic situation improves. The money supply has been significantly expanded in order to fight the current crisis. The danger of increasing inflation lies in the current expansion of the money supply. Increasing rates of inflation in the area of consumer goods also lead to increasing wages. If these fail to materialise, there will be good reason to believe that the readily-available liquidity will flow into investments and create new bubbles.

Outlook

Globalisation is a complex economic process which is interdependent with social and political developments in the individual countries. It is often said that politics has largely lost primacy over the structure of economics and society due to globalisation, because capital has become globally mobile and can avoid national regulation. Many social ills that are seen as arising from the context of globalisation, or even as a direct consequence of it, are, however, not attributable to the opening of national economies and the liberalisation of goods and capital markets, but to the large differences in levels of income between countries. The distribution effects resulting from globalisation are unusually high and cause economic, but also societal and political, adjustment costs. Although globalisation is beneficial for the participating countries and represents a net welfare increase, the globalisation process can be associated with social and political acceptance problems due to the distribution effects on factor income. Indeed, in accordance with the Kaldor-Hicks criteria, policy can redistribute net welfare increase in such a way that everyone is better off; with worldwide mobile capital, however, political redistribution is limited due to the possibility of avoiding it. The acceptance and legitimisation problem of globalisation must be resolved in a different way than making the "median voter" a winner of globalisation.

In the emerging and developing countries, the pressure to adjust owing to globalisation dwindles or even reverses with increasing income levels and higher social standards. Globalisation can be different in various "phases". In the "first phase", we see the trade and specialisation effects that were described here. The distribution effects related to labour and capital income as well as between high and low-qualified workers come about from change to comparative production advantages. These adjustments are not past, but are mostly concluded. The next phase of globalisation will bring a further, more qualitative strengthening of the worldwide specialisation of labour, in which the production processes and logistics chains will increasingly be optimised.

The current financial and economic crisis will not be without consequences for the regulation framework of globalisation. World economic integration, the integration of markets and the segmentation of supply chains across many national borders unarguably have brought high growth potential and efficiency improvements. Admittedly, the dangers of

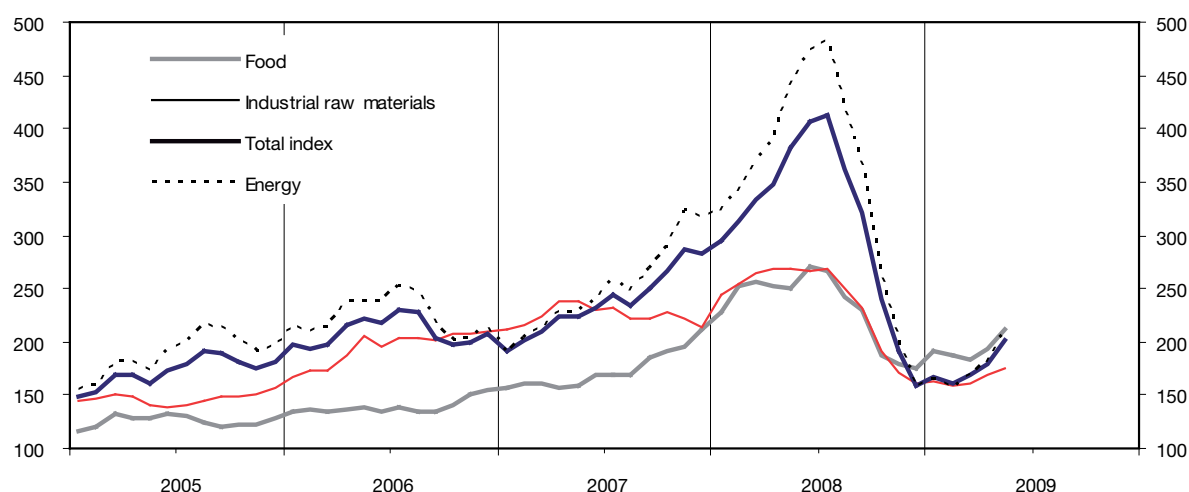
ECONOMIC TRENDS

contagiousness and systemic risk have also been increased by the crisis. The future depends on the development of an international financial architecture that on the one hand provides more stability to the capital markets while making them less susceptible to systemic risk, and on the other hand does not undo the advantages of international capital mobility, labour distribution and the movement of goods. Meaningful regulation creates a balance between opportunities and risks, as well as the costs and benefits of globalisation. International currency funds could take on an important role in this, insofar as they indicate aberrations in a timely fashion

and lessen the consequences of crises. In addition, reinforced monetary and fiscal policy coordination between countries must be undertaken. For this the large emerging and developing nations, such as in the framework of a G20, must be included as well as the industrialised countries. This is inevitable in any case in the face of global problems, such as climate change, that require an international solution. Given the varying costs and benefits, the bargaining positions of the various countries with regards to both climate protection and the regulation of international capital markets are very heterogeneous and mutual agreement is anything but simple.

HWI Index of World Market Prices of Commodities¹

(2000=100)



Commodity Groups ¹	2008	Nov. 08	Dec. 08	Jan. 09	Feb. 09	Mar. 09	Apr. 09	May 09
Total Index	315.8 (33.4)	191.0 (-33.6)	159.7 (-43.6)	166.7 (-43.6)	160.9 (-48.5)	169.5 (-49.2)	180.0 (-48.2)	201.5 (-47.4)
Total, excl. energy	236.0 (12.9)	173.5 (-18.7)	164.7 (-22.7)	171.7 (-28.0)	167.7 (-33.7)	168.5 (-35.9)	177.1 (-32.7)	186.9 (-29.0)
Food total	233.0 (34.3)	178.2 (-9.0)	175.2 (-17.3)	192.4 (-15.3)	187.0 (-25.6)	184.0 (-28.3)	194.1 (-22.9)	212.7 (-15.3)
Industrial raw materials	237.4 (5.7)	171.4 (-22.4)	160.0 (-25.1)	162.6 (-33.2)	159.3 (-37.2)	161.7 (-39.0)	169.6 (-36.7)	175.6 (-34.6)
Agricultural raw materials	150.7 (-3.5)	117.3 (-26.9)	110.3 (-31.8)	109.8 (-31.9)	104.6 (-34.5)	104.5 (-35.7)	107.2 (-33.6)	112.0 (-30.8)
Non-ferrous metals	242.2 (-11.1)	148.1 (-42.8)	122.7 (-48.7)	124.9 (-50.0)	121.6 (-56.1)	128.4 (-56.9)	144.5 (-51.1)	151.8 (-46.4)
Iron ore, steel scrap	482.2 (60.8)	394.4 (31.7)	407.8 (35.8)	420.2 (-10.6)	422.6 (-10.5)	420.9 (-13.2)	422.6 (-17.7)	428.2 (-21.7)
Energy	354.4 (41.6)	199.4 (-38.3)	157.2 (-50.4)	164.3 (-49.1)	157.6 (-53.8)	169.9 (-53.9)	181.4 (-53.3)	208.6 (-52.7)

¹ On a US dollar basis, averages for the period; figures in brackets: percentage year-on-year change.

Further information: <http://www.hwwi-rohindex.org/>