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Prepared by:
Global Economic Monitoring Unit
Development Policy and Analysis Division

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1. Introduction

The spring 2007 meeting of Project LINK was held in Beijing, China from May 14 to 17, hosted by the Chinese Academy of Social Sciences (CASS). More than 100 participants from over 40 countries and several international institutions attended the meeting. The agenda of the meeting covered the world economic outlook, current applied economic issues, and selected economic modelling issues. A joint session of the LINK meeting with CASS China Forum was focused on the Chinese economy.

This report summarizes the content of presentations and discussions during the meeting. The LINK Global Economic Outlook prepared by the Economic Monitoring and Assessment Unit for the meeting, the LINK Country Reports prepared by country participants, and most of the documents presented at the meeting are available on the United Nations website (<http://www.un.org/esa/policy/index.html>) and the Project LINK Research Centre website at the Institute for Policy Analysis at the University of Toronto (<http://www.chass.utoronto.ca/link>).

On the morning of 14 May, **Mr. Pingfan Hong (UN DESA)** chaired the opening session by thanking the sponsor of the LINK meeting, CASS, particularly Mr. Wang Tongshan and his colleagues, on behalf of the UN Under-Secretary-General for Economic and Social Affairs. He expressed gratitude to Professor Lawrence Klein for his intellectual leadership for Project LINK and to Professor Peter Pauly for his efforts to manage the project. He also thanked all the LINK participants, particularly Professor Clive Granger as a special guest to the meeting. He then introduced Mr. Wang Changsheng, Executive President of the State Information Centre, to deliver the opening statement.

Mr. Wang (State Information Centre) said that he was honoured to jointly organize the event on behalf of the CASS and National Bureau of Statistics (NBS). He mentioned the important role of Project LINK to the Government in the understanding of the economy and bridging academia, government and research institutions. Since 1985, with the help of Lawrence Klein, LINK has pushed forward econometrics and economic research in China and has made an active contribution to economic policy analysis in China. He believed that Project LINK would continue to play an increasingly important role in economic research and that China would continue to cooperate with other countries and partners in this respect. Finally, he wished great success and a happy stay to all in Beijing.

Mr. Peter Pauly (University of Toronto) welcomed all participants on behalf of Project LINK. He expressed his gratefulness to CASS for hosting and organizing the conference. He also welcomed Mr. Granger and said that it was a great pleasure for him to be here. On a personal note, he mentioned that this was the first LINK meeting in 40 years without Lawrence Klein. He wished best of luck with the meeting and great fun in Beijing.

2. World economic outlook

2.1 Global economic outlook

In his UN/LINK *Global Economic Outlook*, **Mr. Rob Vos (UN DESA)** pointed out that world growth was still robust, but moderating as the United States was slowing down notably. Meanwhile, the expected deceleration in China, the EU and Japan for 2007 will be only modest.

A slowdown is expected in all country groups in 2007. While the United States will be leading the slowdown, it is expected to recover in 2008 along with business investment. In contrast, Japan is expected to decelerate slightly in 2008. In the economies in transition, growth is still robust due to investment in infrastructure. The slowdown in developing countries on the other hand is noticeable. The group of least developed countries will fare better in 2007, albeit with large country differences and volatility. Growth will be boosted in some of these countries thanks to the remarkable performance of the mining and agricultural sectors and improved political situation.

World trade volume is expected to continue to grow strongly but at a somewhat slower pace than in 2006. Commodity prices may have peaked in 2006: Oil prices are expected to decrease in 2007 and recover in 2008 but with uncertainties. Metal prices surged in 2006 and are expected to moderate. Agricultural product prices have flattened, but some products used for alternative energy have increased in price.

Yield spreads for developing countries are exceptionally low. Capital flows continue to be strong but lower than before, with foreign direct investment concentrated in a few emerging market economies. Also, net financial transfers continue to increase from developing countries to developed countries, mostly through reserve accumulation.

Employment creation is still a challenge despite growth as for example in the case of some South East Asian countries. Another policy challenge is the apparent end of the monetary easing in developed countries, which is expected to dampen global demand.

Global imbalances may start to stabilize in 2007, but are still large in magnitude. In addition, the United States' foreign debt position is deteriorating further, resulting in continued weakening of the US dollar. The trajectory of oil prices is still uncertain. The possibility of a more severe downturn in housing markets represents a significant downside risk to the economic outlook. Various indicators measuring the performance of the housing market in the United States such as construction and the weakness of the sub-prime market show a significant recession in activity but the baseline forecast still assumes a mild adjustment in the housing market, and hence a moderate slowdown in the economy.

Among the major policy challenges are how to prevent a hard landing of the developed economies and how to achieve a gradual adjustment of both deficit and surplus countries. In order to obtain this, greater policy coordination will be necessary.

Mr. Timothy Callen (IMF) presented the global economic outlook based on the IMF *World Economic Outlook* of April 2007. Only a modest slowdown in growth is expected. Some potential problems are expected such as a further deterioration in the United States housing market, developments in the financial market, inflationary and oil price concerns, and the persistence of the global imbalances. Although US growth has slowed with little impact on the rest of the world so far, it remains to be seen whether the rest of the world can continue to grow if the US continues to decelerate. In the past, recessions in the US have had a much greater impact on the rest of the world than mere slowdowns, where trade has been the main channel of transmission. In the financial market, a bearish market usually has a greater effect on the rest of the world than a bullish market. A sharp slowdown is expected in the US for 2007, but growth in

the EU and Japan are expected to be above potential. GDP growth is expected to slow down in emerging market economies (EME) and developing countries.

As a whole, global growth is weighed down by downside risks. For example, the US housing sector presents an uncertain outlook as inventories are high, and sales and mortgages decrease. The problems in the sub-prime housing market, however, may not pose a threat as long as they are contained. Housing prices in many other countries have also slowed down. On the upside, the US labour market remains strong.

He noted that current account deficits in some emerging market economies are larger than in 1996 (prior to the Asian financial crisis). Meanwhile, capital flows to emerging markets continue to be strong as spreads remain low. However, if liquidity conditions tighten, capital flows to these countries may slow down.

Inflation has generally moderated in developed countries, but core inflation in the US is higher than what the Federal Reserve Bank desires. This is against the backdrop of rising capacity utilisation in the developed economies.

Capacity for oil production is limited and the potential for another spike in prices remains. The IMF also foresees little progress in resolving the global imbalances. In conclusion, only a modest slowdown in global growth is expected, but risks are on the downside.

Mr. Carl Weinberg (High Frequency Economics) prefaced his comments on the global outlook by noticing that in the for-profit financial industry there is no expectation of making precise forecasts; a greater than 50 per cent chance of success is good enough to make profits. This remark paved the road to the presenter's central concern, which is that the implications of a slowdown in the US on the rest of the world are not sufficiently incorporated in the outlooks produced by the main institutions represented in this LINK meeting. A review of history shows that when the US economy slows, two times out of three the world follows.

According to Mr. Weinberg, the problem with the US economy cannot be limited to the housing market alone. Lending and consumer demand would likely follow from a fall in house prices and a weakening in the construction sector. The dollar would likely depreciate and the expected policy response (rising interest rates and tightening fiscal stance) would make matters worse. Regarding Japan, the risk of a large swing of carry-trade flows is high. If this were to materialize, Japan's financial markets and the economy would take a serious blow (indeed, Japan's Leading Economic Indicator is already declining). In addition, the mild recovery in the euro area may deteriorate in 2007, among other reasons owing to the rapid expansion of the community to embrace new members. Finally, there are palpable problems of food inventories, which may lead to rapid price rises, exacerbating policy reactions.

Overall, several weaknesses affect current forecasting models. Mr. Weinberg highlighted that important behavioural relations (investors' carry trade), or combined effects of changes of market sentiment and policy responses (currency depreciation, policy tightening, institutional changes), or even the analysis of food markets, are being left out.

Mr. Yu Yongding (CASS)'s analysis of the world economy was broadly in line with the previous presenters'. His central observations were: (1) the global economy has shown a strong performance; (2) there is a crisis in the housing sector of the US, which may aggravate; (3) the

full effects of such ongoing crisis are unknown; (4) but the impression is that the impact on the world economy would be moderate.

Regarding the Chinese economy, Mr. Yu emphasized that its growth performance was remarkable and that this was expected to continue. There are risks however. One is whether the slowdown in the US turns out to be more severe and widespread. In that case, the Chinese economy would be vulnerable because it is very dependent on US demand. Another risk also concerns relations to the US: whether or not the authorities manage to ensure a slow and well calibrated correction of the exchange rate. Undue pressure for rapid appreciation would severely affect producers.

There are other risks which are not directly related to the US economy. One of these regards the evolution of prices of oil and commodities. Another issue is the excess liquidity generated by external surpluses, leading to rapid appreciation in the asset markets. The stock accumulation by the official sector is also problematic. Finally, the investment trend is extraordinarily high. All these factors may also trigger inflationary processes, which could be seriously damaging, as experience shows.

Mr. Yu finally emphasized that it would be misleading to think that the latter set of problems are confined to the Chinese economy. On the contrary, an unwelcome turn of events in China would have serious repercussions on the world economy as the Chinese economy has grown considerably in importance as exporter, importer and investor, relating with countries in all continents.

The policy responses that the Chinese authorities are contemplating include: (1) a measured slowdown of net exports by a moderate pace of appreciation, necessary to contend the notional / potential losses of excessive reserve accumulation; (2) sterilization of excess liquidity by selling bonds to commercial banks and by increasing bank reserve requirements; (3) fiscal expansion aimed at creating jobs (the required pace is about ten million jobs a year). These and other measures, taken together, would serve Chinese interests and would also help to improve the stability of the world economy.

During the open floor discussion, Mr. Weinberg was questioned about the potential global effects of a crash of the Chinese stock market. He replied that Chinese stock market developments were indeed relevant for Wall Street investors, but it would be difficult to quantify their impact because of limited information availability about the volume of investments in the Chinese stock market. Besides, most capital inflows to China still take the form of foreign direct investment (FDI).

In response to a question about the poor employment situation in China, Mr. Yu expressed doubts about the figures used. Though the elasticity of job creation was becoming weaker, he argued that the Chinese economy had been successful in reducing unemployment. He stressed that there was actually a risk of labour shortages in some sectors.

A remark was made on Mr. Callen's presentation, arguing that the IMF outlook seemed to downplay the possible effect of a slowdown of US consumer demand on the European economies. While agreeing that the impact of a US slowdown on Europe may end up being significant, Mr. Callen stressed that fundamentals in Europe are sound and that productivity in the EU and Japan are rising. He acknowledged that a full recession in the US, instead of a mere

slowdown, would have a substantial impact on Europe and the rest of the world. Following up, another comment from the floor stressed that structural changes had taken place in the world economy and particularly in Europe - for example, oil prices had been rising without major effects on domestic price levels worldwide. Likewise, the Euro had been appreciating significantly but export performance remained broadly undisturbed. In this context, it was also pointed out that European institutes and many observers had actually revised their growth expectations upwards.

A further comment of a more technical nature stressed that different forecasting models could lead to different recommendations. A typical Vector Auto Regression (VAR) system offers information about how a set of variables evolves over time, while detailed macroeconomic models seem to offer better information about the adjustment towards equilibrium. In light of the latter approach, the current trends in the US and the world economy may not be “shocks” but rather equilibrating corrections, from positions distant to equilibrium towards the equilibrium path. Thus, treating these phenomena as shocks would be a big mistake, and trying to interfere with the market equilibrating forces might make matters worse.

2.2 Outlook for commodity prices

Mr. F. Gerard Adams (Northeastern University) discussed the *non-ferrous metals* markets, saying that they were in the midst of a super-cycle, with an extraordinary price boom continuing in 2007. The rise in these prices had been more rapid than oil prices over the last few years and had been much higher than the usual cyclical swing.

He described a typical cycle. In the early stage, prices are low and there is a lack of exploration and mining development (1990's - early 2000). Then there is a sharp increase in demand with economic recovery and in the present case, particularly with the strong growth of China and India, followed by a speculative increase in inventory demand and then a supply shortage, accompanied by extraordinarily high prices. In the later stage there is an increase in supply as new mines begin producing, but with a long time lag, a slowdown of economic activity with the business cycle peak, speculative inventory reduction and finally a price decline. The current outlook depends on how long it takes for new supply to come on stream and how quickly supply will catch up to demand.

One question was whether there had been a bubble in these markets or whether prices were now permanently higher. Non-ferrous metals are less crucial than oil for developed economies but are very crucial for producing countries. There are plenty of deposits, so in the long run prices would be low because the marginal cost of extraction is low, but the short run is more difficult.

Mr. William Meyers (Food and Agricultural Institute) discussed selected *agricultural commodities*. Crop prices were coming off their 2006 and 2007 highs, but remained at historic levels. The major driving forces were the increased use of bio-fuels, both ethanol in the US, and bio-diesel in the EU, but drought in Australia and poor harvests in the US, Russia and Ukraine were also generating upward pressure. Looking at US export prices for maize, price forecasts have been revised upwards, and futures prices have also risen noticeably. This is due partly to supply issues, but mostly to the very strong demand, particularly for ethanol in the US. The use of maize for ethanol production now exceeds exports of maize.

Assumptions underlying the ten year ahead projection are an average world growth above 3 per cent for the 2006-16 period, and oil prices remaining in the 30-75\$ range. The world corn stocks to use ratio has an inverse relationship to price, and has fallen significantly since 2000, so corn prices are expected to remain high. Wheat prices are also expected to remain high, owing to weather issues and indirectly to maize. Similarly, rice prices are expected to remain firm. Output of some categories of oil seeds and vegetable oils is expected to increase, to meet demand for bio-diesel in the EU, while production of other categories is hurt as land is diverted to higher plantings for bio-fuels. Cotton prices are expected to be stagnant. Dairy products are supported by income growth and higher demand and strong livestock prices.

At issue is whether agricultural markets have changed fundamentally due to the increasing importance of bio-fuels. Bio-fuel expansion is policy driven in many countries although it is market driven in Brazil and there are uncertainties. In the US its continued expansion depends on oil prices, and in both the EU and US it depends on continuing policy support. It has also increased demand and price volatility in the cereal and oil seeds markets. While it is unlikely that bio-fuels will make a major impact on energy markets, they are already having an impact on commodity markets. This is the first time the 10 year outlook has had maize prices above \$150 mt and wheat at 200\$ mt.

Mr. Robert Kaufman (Boston University) took stock of activity in world *crude oil* markets since the last meeting of Project LINK. There had been a lot of volatility in prices. Events that impacted on this were the warm weather in January and February and OPEC twice lowering its quota. His oil model suggests that prices should remain high but should not move any higher, explained in part by planned OPEC capacity increases.

In the past, (2005 and 2006) the model had under-predicted prices, so he presented a more formal statistical evaluation of the forecast performance of the price equation. The dependent price variable was the near month NYMEX. The evaluation used a one-step ahead out-of-sample forecast and pitted the econometric model against forecasts derived from futures prices and from a random walk model. Both the futures market and the random walk did better than the econometric equation according to the Diebold and Mariano test statistic. The futures market and the random walk were close to tied in forecast performance, with the sign test suggesting at the 10 percent level that the random walk was better.

One important operational issue was how to use the resulting price forecast, with the problem of different prices for different markets. Usually the West Texas Intermediate (WTI) price was \$2 higher than Brent because WTI is sweeter crude, but at present Brent is higher than WTI. This is explained by a current shortage of refining capacity for WTI so that demand for WTI has fallen. However, in the future, the price of Brent may fall relative to WTI as a new field is currently coming on stream that is producing heavier oil than anticipated. This heavy oil will lower the price because it is less valuable to refineries. Consequently the spread between the two is likely to remain volatile, so for forecast purposes it is best to use an average price.

2.3 China economic outlook

In his *Opening Address for the Joint CASS Forum and Project LINK Session*, **Mr. Leng Rong (CASS)** noted that China's growth was over 10 per cent, which had changed China's overall outlook and the outlook of the world. He posed the questions of whether this growth could be maintained and how peaceful and harmonious development could be achieved, both of

which were important for future world economic development. Mr. Leng expressed his appreciation that the organizers combined these two sessions and said that this enabled Chinese scholars to better understand the world and also enhanced the understanding of China by foreigners. On behalf of CASS he thanked all and wished a successful and pleasant stay in China.

As a starting point of his presentation, *From High-Speed Growth to Harmonious Development: Review and Prospect for China's Economy*, **Mr. Chen Jiagui (CASS)** gave a brief overview of China's fast economic growth and integration into the global economy since the beginning of reforms in 1979. He subsequently analysed the main factors behind such fast economic growth in the past and future, pointed out major current problems facing the Chinese economy, and suggested approaches for addressing these problems within a framework of harmonious development.

While Mr. Chen suggested that annual economic growth would slow somewhat over the next 10 to 15 years, he was optimistic that it would still reach levels around 7 per cent. This is owing to continued rapid industrialization and urbanization; growing domestic demand in the face of higher incomes; further opening up and reform; continued high savings as a source of finance; further growth in the labour force until at least 2020; as well as institutional reforms and technological innovation.

In order to achieve such sustained growth, however, several structural problems have to be addressed. These include growing imbalances in the Chinese economy, ranging from the investment-consumption imbalance to the trade imbalances, as well as development imbalances between different regions. In addition, increasing income gaps at the overall level as well as between rural and urban dwellers, between different regions and sectors, and between different groups within the urban population may also exert negative impacts on long-term economic growth. Furthermore, Mr. Chen highlighted potential growth bottlenecks arising from resource and environmental constraints stemming from the current pattern of resource intensive growth with high emissions of pollutants.

Mr. Chen suggested a number of policy measures to overcome these problems. In order to address the structural imbalances, he stressed the importance of rural reform in order to support farmers, including through tax reforms and the establishment of a new social security system for rural areas. Regional disparities could be addressed by growth promoting measures in the less dynamic regions; social development could be streamlined more closely with economic development through targeted investment and institutional reforms; environmental growth constraints could be addressed through sustainable development principles, and domestic market development could be furthered in step with continued international integration, in order to promote growth and modernization. Technological innovation would be a means to achieve sustained rapid growth while ensuring the efficient use of resources. More environment-friendly growth could also be achieved through a shift towards service sector growth, and the active development of renewable resources.

Mr. Clive Granger (University of California in San Diego) presented *A Comparison of Economic Growth between China and India*. He started by pointing out the growing importance of India and China to the world economy, emphasizing the similarity of these countries as economies with large populations and steady growth rates of output and trade. The remainder of

his presentation concentrated on a discussion of the general properties of trends, giving examples of different indicators from these two economies.

First, he noted the importance of trends in time-series analysis, although it is not easy to define a trend. A linear trend could be increasing steadily over time, but still this is not a definition. One could give many examples for a trend and “increasing”, or “monotonic” will not be a necessary property. In fact, a trend could be of all types of shapes. Then he gave examples for different time-series. The graph of oil prices for the period 1970-2004 was indicative to the problems which arise when one wants to define a trend. Although local trends related to major events – such as the 1973 Arab Oil Embargo, Iranian revolution, Iran-Iraq War, Gulf War, Asian economic crisis, etc. – are important, it is difficult to identify them: data on oil prices have no distinct trend.

Looking at the country level, there is an increasing trend in Chinese oil production and consumption for the period 1980-2003 while the trend is not defined for Indian oil production. The time-series of China energy efficiency, measured as energy consumption per dollar of GDP, has a decreasing trend. Also, there are time-series which could change their trend – such as the GDP per capita for China and India for the period 1984 – 2004. Given a stationary trend, as was the case of US GDP for 50 years, forecasting with exponential weights would give a 15 year ahead forecast with confidence intervals, providing lower and upper bounds of the forecast. He emphasized the importance in providing interval estimates instead of point estimates. However, if the trend does not exist any longer, forecasting the behaviour of the time-series on the historical trend will be inaccurate as it cannot capture the dynamics after the break of the trend. Nowadays, the time-series of economic indicators for many economies have breaks, which make forecasting difficult.

Mr. Lawrence Klein (University of Pennsylvania) via video presented a joint paper with Wendy Mak, on *Economic Growth in China and Its Sustainability*.

He started with a summary of his studies of Chinese economic growth over the past two decades or so. He mentioned that one of his studies from two years ago showed that China’s GDP was underestimated, rather than exaggerated, if China was to be measured by the same standards as other economies, i.e. subject to official estimates of inflation with the same kinds of adjustments that have been made for the United States by the Boskin Commission. Later, the National Bureau of Statistics of China found it necessary to make an upward adjustment for expansion in the service sector of the economy. This brings the estimated values of GDP growth up by one-half percentage point for the total expansion.

In the outlook, he mentioned Chinese policy makers felt uncomfortable with the high persistent growth pattern and were trying to reduce the rate of growth by a small amount in order to avoid overheating of the system. This makes it likely that China will be reporting GDP growth nearer to 9 per cent or even a bit lower, in the near future. But even these modestly lowered growth rates, if the present policies are successful, still raise the question of sustainability.

Mr. Klein reported his plan to link two econometric models of the Chinese economy together, one at high frequency, using monthly, weekly, and even daily data, and another at low frequency, based on quarterly or annual data that can be consistently linked in such a way that the high-frequency forecasts from the very short-run model serve as objective initial values for the quarterly (low frequency) model in the making of medium-term forecasts that are designed to

carry projections up to 5 years ahead or more. It is from the repeated solutions of these two models together that one can obtain useful readings on the matter of sustainability, which is based on a number of factors, such as pollution, the wage differential between Chinese workers in the fast-growing industrial economy and US wages, exchange rates, demographic policy, energy, the financial sector, and a few others.

In conclusion, he said that the macroeconomic performance of China had been stunning, and there was no clear sign that the ongoing performance was running into trouble now; but we knew that the relative wage ratio had been changing and China's advantage would surely continue to fade. Workers would increasingly demand "a piece of the action".

For the medium-term outlook, it is important to note that much of the present high level of economic activity is based on residential property ownership, personal automotive transportation, better diet, and other features of an advanced modern society with market guidance. Against the benchmark of the US residential boom of the last two decades and its current temporary correction, there is a distinct possibility of such fluctuations coming to China - although not necessarily with the same cyclical timing, because China starts from a much lower platform. In addition, preparations for the Olympics and World Expo are certainly driving forces behind China's present expansion. More distant future considerations must be watched carefully by senior leadership in China.

Mr. Xie Fuzhan (National Bureau of Statistics of China) delivered a speech on *China's economic situation*, beginning with an analysis of the factors driving strong growth, providing a long-term outlook, and discussing problems as well as suggested policy measures.

In analyzing the major driving forces of Chinese growth over the past decades, he mentioned a number of factors as follows. First, the increase and structural change in consumption has led to structural changes in industry, pushing the acceleration of industrialization, particularly in the areas of housing, automobile, information and telecommunication. Demand in these areas has in turn led to development in infrastructure and raw materials. Second, increased mobility of labor has accelerated urbanization, with the rate of urbanization rising from 10.6 per cent in 1949 to 17.9 per cent by the end of the 1970s, but surging to 43 per cent in 2005. Third, integration into the global economy acted as an important catalyst for the development of the Chinese economy. China's accession to the WTO in 2001 marked a new era for China, with trade and FDI expanding tremendously, strengthening China's competitiveness. Fourth, further reforms have led to a more resilient microeconomic structure and more effective macroeconomic management. He mentioned some latest progress in reforms, including new laws to define and protect different types of ownership and property rights, adoption of a sharing system for the state-owned banks, and various macro policy measures to stabilize the economy.

In the outlook, Mr. Xie mentioned that China had a large potential to develop, with a vast domestic market. China's industrialization stands only at an early stage, in comparison with many developed economies. For example, further urbanization in the next twenty years will bolster demand for housing, cars and infrastructure, suggesting a potentially long period of high growth for the economy. Meanwhile, he believed that ample labour supply, including the transfer of labour from the agricultural sector to other sectors, and a high saving rate should provide support for such high growth. A progressive institutional reform, including strengthening the legal system and change of the Government's role in the market economy, should continue to

improve the efficiency in the allocation of resources. He also expected lasting favourable international conditions for China's economic development as "peace and development" remain the global theme.

Mr. Xie also pointed out a number of issues in the Chinese economy: living standard remains low and development is unbalanced. The main constraints for China in his opinion include: energy and environmental constraints, the need to create productive and gainful employment, as well as financial implications of an aging population, disparity between the rural and the urban areas, and imbalances in the external sector.

In conclusion, he summarized a number of major policy measures the Government has adopted, or is planning to adopt in the near future: (1) reconstruction of China's rural area, including measures to boost rural income and agricultural output; (2) transformation of the growth pattern, including measures of energy conservation and environmental protection, and promotion of technological innovation; (3) Development of the West and revitalization of the old industrial bases in the Northern East, along with the continued modernization of the East Coast; (4) maintaining of the open-economy strategy and optimization of the export-import structure; (5) further improvement of the socialist market economy with various institutional reforms; and (6) promotion of social harmonization by policies in such areas as employment, social safety net, education, health, and income distribution. With these policy measures, he believes that China can achieve the development goal of becoming "xiaokong" (a middle-income economy), as well as the renaissance of China.

2.4 Regional economic outlook

Industrialized countries

Mr. Ray Barrell (National Institute of Economic and Social Research) presented the outlook for the *industrialized countries*. The growth forecast was broadly unchanged from the previous LINK meeting, but the US was slowing more than expected while the EU and Japan were stronger than expected. Notable features were the strong recovery in Germany and the deteriorating situation in the US housing market. Generally, he was more optimistic concerning the EU, where growth could be termed very strong in 2006 but still not robust, and also more optimistic on Japan. The key risks to the forecast are related to the US housing market and to possible mistakes in monetary policy stemming from the increased volatility of oil prices.

Oil price volatility complicates monetary policy because policy makers need to decide whether a shock is temporary, in which case policy should not react, or permanent, in which case it should. Since the last LINK meeting, current financial market expectations for US interest rates have come down by about ½ percentage point for both 2007 and 2008, indicating that financial markets may be overreacting to the recent oil price decline.

Inflation risks are most serious in the US and the UK. In the US, inflation was too high in 2005 and 2006. Inflation has slowed recently but it is expected to rise again in the future, so market perceptions that rates will come down may be wrong. For the Euro area, there have been only minor revisions to interest rate expectations. Inflation has been near the ECB's target for a number of years and inflation expectations have declined in the last few months. Thus far, the large increase in the German VAT has had no visible impact on inflation. But if there is a significant lagged impact, rates may go higher than anticipated.

The current account balance of the United States improved significantly in the 4th quarter of 2006. This stems mostly from the fall in oil prices, but falling domestic demand also accounts for some of the improvement. If this is sustained, the current account balance will stabilize at 5-6 per cent of GDP, causing the debt to GDP ratio to stabilize at 100 per cent. In the last few years, the US dollar has depreciated by 15 per cent. In a counterfactual scenario, if the currency had been stable, the current account deficit as percentage of GDP would be 2 percentage points higher. Another counterfactual experiment reveals that the increase in oil prices since 2002 has added 1 per cent to the deficit.

In the US housing market, investment has slowed sharply and this has directly affected GDP. But the housing investment to GDP ratio is simply returning to historical norms. Investment can be affected by demand pressure, which depends on population growth and housing density and adjusts slowly, or by speculative behaviour which depends on returns to housing investment and can adjust abruptly. US housing investment has closely tracked the ratio of the annual growth of house prices to the investment deflator (an approximation to Tobin's Q), suggesting that the past has been mostly speculative pressure. House prices are expected to be flat in 2007 and 2008 and this implies private consumption will slow. The question is whether this will affect the rest of the world. At the country level, house prices affect activity through wealth effects on consumption and through their effect on housing investment. For the former there is good econometric evidence for these effects in the long run but in the short run it is very country specific with no effects in some. For the latter, Spain is the only other country where the investment to GDP ratio has risen to well above historical norms, so it is the only other major risk country.

Slower US growth from the housing market will have little spillover. A fall in house prices by 10 per cent reduces US growth $\frac{1}{2}$ per cent, but by only 0.1 per cent in the EU and Japan. The current account balance improves by 0.3-0.4 per cent. In comparison, a 15 per cent fall in real exchange rate has much larger spillover effects. US growth declines by 0.5 per cent and the current account balance improves by 3 per cent, but the spillover to the rest of the world is 2-3 times larger.

In the Euro area, growth in 2006 was the strongest since 2000 and risks are on the upside. The overall budget deficit improved by 0.6 per cent, inflation fell below 2 per cent, and private investment growth doubled. Behind this favourable development was the very strong performance of Germany. Exports increased by 13 per cent and its trade share rose. Private investment was also sharply higher. Some of this improvement was due to labour market reforms. In the early phase of these types of reforms, wages are depressed, putting downward pressure on disposable income and consumption. But later, positive effects become dominant as improved productivity leads to higher potential output and to higher wages, which in turn strengthens consumption. The fiscal position in the Euro area is much improved, going from a deficit of 3.1 per cent of GDP in 2003 to 1 per cent in the medium term. German revenue increased sharply, boosted by the VAT increase. France, Italy, Portugal and Greece still have fiscal problems. France has weak growth compared to the euro area average, owing in part to fewer labour market reforms.

The Japanese outlook is quite optimistic. Employment is good and wages are expected to rise in the future which should push inflation higher. The exchange rate is expected to devalue and so provide further upward pressure on prices.

Mr. Lawrence Klein (University of Pennsylvania) via video discussed the outlook for the *United States*. With the fiscal and current account deficits weighing on growth, GDP was now growing slower than potential output, which he put at around 4 per cent. GDP was expected to grow between 2 and 3 per cent in the first half of 2007, and inflation would be above 2 per cent. For the monetary authorities this could be termed a soft landing, but inflation is still above their comfort zone. Growth in 2007q1 was very low, but based on his high frequency forecast Mr. Klein expects this figure to be revised upwards. Inflation as measured by the personal consumption expenditure deflator was greater than 3 per cent.

So far there has not been a crash in the real estate market, but indicators such as housing starts and inventories are poor. This implies a slowdown but not a recession. The price of new homes, inventories of new homes and decreasing equity withdrawal all point towards further slowing.

Oil prices continue to be a concern, given worries in the Middle East. Volatility is a big problem, and there is a chance, if the geopolitical situation worsens, that the price of oil could go to \$80. This could have spillover effects to other commodities, as was seen in the recent price increase of maize, when the demand for ethanol went up.

Concerning the United States' international trade position, it seemed that recent exchange rate adjustments were helping, but there had been little movement against Japan or Canada so far; and vis-à-vis the rest of world, the J curve effect was delaying necessary adjustments. However, the trade balance improved by \$100 billion from 2006q3 to 2006q4, and the monthly deficit shows further improvement.

Developing countries and economies in transition

In his *Emerging Markets Overview*, **Mr. Hans Timmer (World Bank)** pointed out that strong growth was not limited to big developing countries; that continued strong growth in developing countries was not a reflection of de-linking, but rather a result of globalization; that the unwinding of imbalances was already going on; and that overheating might be a bigger risk than global recession.

Over the past years, developing countries have grown faster than the world average, and the growth of the developing regions excluding China and India is also higher than the world average. In addition, the pattern reflected in recent years is significantly different from the one observed a decade earlier. A comparison of histograms of growth between 1986-96 and 1996-2006 shows that the latter has shifted to the right and has a higher kurtosis.

On the globalization process, Mr. Timmer argued that there had been a clear shift towards responsible fiscal policy, trade openness and industrial production, triggered by competitiveness and flexibility which have marked the success of developing countries in a clearly more integrated world economy.

Concerning global imbalances, Mr. Timmer observed that an unwinding was already beginning to take place. A meaningful shift of domestic absorption is taking place, where the US is substantially reducing domestic absorption and developing countries are increasing absorption. Further, oil suppliers are growing increasingly beyond the OPEC members and the same can be

said with respect to other commodities, which is helping to balance the world economy while the US trade balance is shrinking.

In this context, since it seems likely that there is going to be a smooth correction of global imbalances rather than a disorderly one which could possibly trigger a world recession, the risk now leans to the other side: overheating. This is corroborated by the observation that inflation is rising in many parts of the world, together with a tendency of bond and equity flows to increase.

The presentation was complemented by regional growth forecasts. East Asia and the Pacific will keep a solid pace of growth, albeit at a slightly moderated pace. Growth in Central Asia and Europe will continue to be strong, though subject to inflationary pressures and in some cases large current account deficits. In Latin America and the Caribbean, growth will slow down from nearly 6 per cent in 2006 to about 4 per cent. Populist measures in countries like Argentina, Bolivia, Ecuador and Venezuela remain a concern. In the middle-East and North Africa, growth will remain strong but the main problems will be inflation and unemployment. In sub-Saharan Africa, growth will be strong - due to an investment boom and possibly supported further by the 2010 World Cup in South Africa. Growth in South Asia will experience a moderate slowdown but remain at relatively high rates, and the risk is one of inflationary pressures.

Mr. Keiji Inoue (UN DESA) presented the regional outlook for *Latin America and the Caribbean*. During recent years, this region has enjoyed relatively favourable conditions which seemed to have reached a peak in 2006. Economic growth was sustained over the last three years around 6 per cent, inflation has been hovering around 6 per cent and unemployment has come down to about 8 per cent. In the outlook, growth will be somewhat slower and inflation slightly on the rise.

Growth has been broad-based and significantly higher than expected, particularly for most of the larger economies of the region. Mexico grew at nearly 5 per cent in 2006 despite the relative slowdown in the US economy, owing mostly to strong domestic demand and construction activity. Likewise, strong growth in Brazil and Argentina resulted from greater domestic activity in the wake of expansionary monetary policy in the former and fiscal relaxation in the latter. In Venezuela, despite positive conditions for the oil industry, the greatest dynamism originated in domestic demand. And a mix of favourable external conditions and fiscal expansion aided Colombia and Peru.

Two countries which experienced a relatively disappointing performance were Chile and Ecuador, mostly due to shocks in domestic production (mining in the former and oil in the latter).

Looking at the fundamentals, it was observed that the region as a whole is experiencing a turnaround from previous periods of instability and twin deficits. At present, the fiscal sector is moving towards balance and the external account is in positive numbers. The positive external performance is in part related to increased activity levels in China and its resulting needs for primary products. On the other hand, there may be adverse trends in foreign financing. While current transfers (mostly remittances) have been on the rise, FDI in the region is weakening, while FDI outflows into the US have been increasing.

Finally, Mr. Inoue highlighted that most risks in the outlook are of external character: slowdown in the US, fall in export commodity prices, a potential inflationary rise in oil-

importing countries owing to high oil prices, and difficulties in keeping inflation under control for most countries.

Mr. Kenneth Ruffing (OECD/ADB) and **Léonce Ndikumana (ECA)** both presented their views on the outlook and policy challenges in *Africa*.

Both presenters coincided in emphasizing that growth in the continent was sustained and broad based, in part owing to oil and commodity exports. Beyond this common denominator, the central contention of Mr. Ruffing was that policy challenges diverge between oil exporters and importers. Notably, oil importers were rather prone to inflationary pressures, fiscal imbalances and trade deficits.

Mr. Ndikumana, while acknowledging the inherently different conditions in which oil-exporters and importers operate, shifted attention to the fact that so far it was factors underlying non-oil or primary production (like food, tourism and industry) that sustained growth in the continent as a whole. On inflation, Mr. Ndikumana noted that the major risk was not monetary as such, but rather the presence of structural constraints on the supply side.

Both presenters have also emphasized that despite the notable performance of the African economy, the achievements are largely insufficient to significantly improve living conditions and to achieve the MDGs. Further, Mr. Ruffing noted the risk of continued vulnerability due to still limited integration and lack of diversification in trade. Mr. Ndikumana focused on the potential social and economic costs of weak employment creation. In his opinion, the experience of jobless growth demonstrates the need of a more proactive fiscal stance.

Both presenters concluded their analyses by underlining the necessity of increased aid and of raising its effectiveness.

In her presentation of the regional outlook for *East and South Asia*, **Ms. Cornelia Kaldewei (UN DESA)** stressed that the region stands out as the most dynamic in the world, with growth rates of nearly 8 per cent in 2006, above the world average. China and India lead the regional growth pattern, but rates of growth without China and India are also, and have been over the last years, strikingly high. The performance shown until now is expected to be maintained in the short to mid-term forecast.

There are differences regarding the factors underlying such economic success. While growth is mostly export driven in East Asia (with domestic demand starting to recover), South Asia has been pulled by strong domestic demand, but is expected to experience some cyclical downturn in 2007.

Such differences may help explain different inflation patterns. For East Asia, inflation is subdued and will likely remain so in the outlook. In South Asia, strong domestic demand growth has exerted upward pressure on prices, which would recede only slowly. In line with the diverging inflation patterns, some monetary easing is expected in East Asia – with the notable exception of China – while monetary policy will remain vigilant in most South Asian countries. Fiscal policies in both sub-regions are expected to be somewhat expansionary, with the exception of East Asia's newly industrialized economies.

Imbalances in the region's external sector are set to continue in 2007 and 2008, with a further increase in South Asia's trade and current account deficit, and persistent surpluses in East Asia.

The risks to the outlook are in line with those pointed out by other presenters – a sharper-than-expected slowdown in the US economy, disorderly unwinding of global imbalances, renewed increases in oil and commodity prices, and others.

Ms. Kaldewei concluded with a cautionary note about risks in the medium-term, notably infrastructure deficiencies, environmental degradation and persistent gender inequality.

During the open floor discussion, national LINK participants contributed specifics to the overview given by the speakers, without significantly altering the tenor of the presentations.

One contributor pointed out that the emphasis placed on keeping inflation under control (say, in Latin America) may not help to sustain growth which is most needed. Also, more decisive action was needed to help achieving the Millennium Development Goals. Making these objectives subsidiary to stabilization policy per se may not be the right thing, especially considering that the Latin American sub-region has been for a long time following pro-cyclical policies which in turn threatened stabilization by weakening growth potential and increasing volatility. In some cases, postponing external debt payment to allow for improving social conditions might be a good thing. In particular, overheating should not be the central concern in Latin America. The region is not growing beyond capacity, though some specific bottlenecks would need to be addressed.

With respect to global imbalances, it was noted that one should not be too complacent and trust that market corrections guarantee a smooth rebalancing. Policy, and particularly policy co-ordination, is a viable option that should be kept in sight and promoted.

3. Current economic issues

3.1 Global imbalances

Mr. Peter Pauly (University of Toronto) gave a presentation on *Global Economic Imbalances Re-Examined*. He started with the global economic outlook, mentioning that while until now the global demand substitution had operated relatively smoothly, bigger shocks were likely to come.

He pointed out that there was widespread agreement that imbalances are unsustainable and must be eliminated in the most growth-friendly way ("smooth landing"). The current trend of international asset concentration in the hands of a few countries increases the co-dependency of borrowers and lenders, therefore providing some temporary stability to the unbalanced situation. However, excessive asset accumulation and the reliance on trade-led growth deprive residents of surplus countries of resources that could meet domestic demand, in exchange for risky financial claims. In addition, such large-scale accumulation of international reserves exposes countries to exchange rate risks, and increases the need for return-based investment strategies. In the face of these costs and risks, an orderly unwinding of these imbalances requires a multilateral realignment of economic policies to shift demand, asset allocation, and currency valuations.

A key question is how the US current account deficit will be resolved and whether there will be an orderly dollar decline or a precipitous movement out of US dollar-denominated assets. The US Federal Reserve Bank is facing a policy conflict: defend the dollar or protect fragile private demand. A sustainable solution requires real growth slowdown in the US and a currency realignment in order to stabilize imports, but questions remain about the flexibility of global trade patterns.

The globalized economy is characterized by a fragmentation of production as a consequence of “globalization of tasks”, and determinants of comparative advantage have shifted from “goods” to “skills” to “tasks”. Agency and production costs determine a four-way trade-off: integration at home, outsourcing at home, integration abroad, and arms-length import. As a result, directions of trade re-allocation become more difficult to predict.

Mr. Pauly expressed his belief that a smooth adjustment of currency rates on a multilateral basis was required, in order to mitigate the still-persistent risk of a crisis in confidence in the US dollar. In this context, a gradual nominal appreciation of Asian currency rates would be most helpful to pave the way for a soft landing. Gradual private and public sector (central banks) portfolio reallocation into non-dollar denominated assets would also ease the adjustment.

In the longer run, there are some mitigating trends: Increased domestic capital needs in Asia will impose constraints on US current-account financing; financial restructuring and an aging population will lower savings rates in Asia and induce some repatriation of assets. In addition, an increasing number of emerging markets provide attractive alternative investment opportunities, and OPEC surpluses are already increasingly invested in non-dollar assets.

Summing up, Mr. Pauly emphasized that a winding down of the US current account deficit remained of the highest priority. There is an increasing need for coordinated action as hopes for the US to moderate fiscal stimulus are slim. A slow reallocation of assets by Asian economies, as well as OPEC is already under way. The resulting real exchange rate adjustment will in turn constrain US expansion for the next several years.

Mr. Rob Vos (UN DESA) presented joint work with Pingfan Hong on *International Policy Coordination for the Adjustment of Global Imbalances*. His presentation focused on why policy coordination was needed, the major obstacles to international policy coordination, and the steps that could be taken to overcome these. He also commented on the role China could play in the rebalancing of the world economy within a broader framework of international policy coordination.

Mr. Vos emphasized that the goal of the global adjustment should not simply be to reduce the external deficit of the United States, but to adjust the imbalances at minimum cost in terms of maintaining stable and robust growth for the world economy, particular for developing countries. Thus, the corresponding solution has to include policy adjustments in other countries undertaken in coordinated fashion with corrective policies in the US. To avoid rebalancing through a global recession, the general stance of such coordinated policies would be to stimulate both domestic and import demand in countries with external surpluses and measures to stimulate government and private savings as well as export growth in the deficit countries.

A number of obstacles are currently blocking the process of international policy coordination, such as the disagreement on the urgency to redress the global imbalances and on the risks to the stability of the global economy, as well as Governments' uncertainty about the initial position of their economies and about how policy initiatives will affect the current account. In addition, there is strong resistance from domestic interest groups that stand to be adversely affected by corrective policy measures, notwithstanding the prospect of global welfare improvements.

Mr. Vos suggested several steps to overcome these obstacles, including by developing a consensus on common goals through international consultations with outside mediation, improving the context for mediation and enhancing the perceived legitimacy of the mediator, addressing commitment problems by issuing multi-year schedules for policy adjustments, and initiating a process towards more fundamental and systemic reform of the international monetary system.

In his comments on China's role in the adjustment of the global imbalances within such a broader framework of international policy coordination, Mr. Vos pointed out that while the strong performance of China's external sector had no doubt shown China's success in its reforms over the past three decades, more exports, higher foreign exchange reserves and accelerated growth of GDP were not necessarily good indicators of the economy being on a sustainable growth path.

While it is widely acknowledged that China's foreign exchange reserves currently far surpass the amount needed for precautionary purposes according to any standard, the costs associated with such rapid reserve accumulation are rising. These costs include the opportunity costs of setting aside a huge amount of financial resources that could otherwise be used for financing domestic demand, rather than for financing the deficit of the United States. There are also costs of sterilization of the monetary effects of the large reserve accumulation. In addition, further dollar depreciation could cause substantial erosion of the value of the reserve holdings.

According to Mr. Vos, in order to rebalance China's current-account surplus, the Reminbi needs to appreciate, but only gradually so and only if concerted with other policy measures. For instance, a package of fiscal measures to stimulate domestic consumption could mitigate some of the contractionary effects of the Reminbi appreciation and, more importantly, bring down the excessively high domestic savings rate, which has been at the root of the imbalance in the current account. In the fiscal package, spending could be increased in particular on health, education, social security, poverty reduction and public services, as well as on environmental protection. More specifically, the Government could allocate a certain amount of the foreign-exchange reserves to set up special funds in these areas. The authorities have already started to adopt several of these policies, but would need to move more forcefully on these. If these measures are carefully managed by the Chinese authorities, and conducted in concert with global policy adjustments, this would allow for a benign rebalancing of China's economy. Overall economic welfare would improve through gains in efficiency and an increase in the quality of living standards. The rest of the world would stand to gain as well.

In his presentation on *Bank Reform in China: What it Means for the World*, **Mr. Donald Brean (University of Toronto)** started out by reviewing the banking system in China, and then gave a prognostic of the system with respect to recent and future reforms. He pointed out that a

significant part of the macroeconomic imbalances in the Chinese economy was related to the banking system.

The current structure of the Chinese banking sector differs from other major economies in that bank lending dominates the financial system, accounting for 72 percent of the stock components, and is also the largest in the world in terms of GDP (160 percent of GDP). Its financial stock depth has doubled over the past decade, with bank deposits also worth 160 percent of GDP. Capital formation in China amounts to about 45 percent of GDP, which is much higher than in Japan, Korea and Taiwan, but consumption is only 38 percent of GDP, while savings amount to half of China's GDP. Public saving, however, has decreased its share in total saving, while household saving has increased significantly, owing mainly to precautionary motives and the demographic structure.

Despite improvements towards more prudential standards especially in the public sector, over-investment has led banks to bankruptcy in the past, and non-performing loans (NPL) may well become a threat again in the medium-term future. However, although "Goldsmith's law" states that a weak financial system and weak intermediation can destroy the gains from growth, China may still be able to break this law with appropriate and phased changes in the financial system. Some unique characteristics of the Chinese financial system that have permitted growth despite financial weaknesses are: (1) the population dividend coming from a young working population, resulting in a savings rate of around 45 percent of GDP; (2) China's opening to foreign direct investment, allowing closer links with the well-honed financial networks of multinational corporations; and (3) sound monetary policy management, compensating for the weak financial system.

Until 1994, the commercial banking system consisted of four big state-owned banks (SOCB), and its role was to be the "cashier to the Plan" as a passive conduit of funds to state-owned enterprises. As a result, NPL's were inevitable, and these remained in the books of the banks. In 1994, three new "policy banks" were created under the State Council, and groups of "second-tier banks" such as joint-stock commercial banks, city commercial banks and urban and rural cooperatives were established. In 1999, asset management companies were set up to deal with the NPL problem by "buying" these at a discount from the SOCB's. In 2003, the China Banking Regulatory Commission was set up ending the dual role of the People's Bank of China as banking supervisor and monetary policymaker (in addition, it represented the State as shareholder in SOCB's). At a second stage, the China Securities Regulatory Commission and the China Insurance Regulatory Commission were established. Effective since December 2006, China committed to the WTO to eliminate or reduce restrictions on foreign ownership of banks.

After reforms, the banking system in China is characterized by a relatively small number of banks, a dominance of corporate lending, retail-based deposits and significantly less profitable banks than in other countries. Challenges faced by the banking system are to distinguish the operating requirements of investment banking from retail banking, to develop an adequate corporate culture, to incorporate technology into banking and risk management, and to establish incentives throughout the system. In the long run, this would also help increase the efficiency of monetary policy. Additional policy measures should include reducing inefficient investment, that is, public investment, and increasing public consumption in social services.

Mr. Li Yang (CASS) suggested *Two Basic Strategies to Cope with the Problem of Excess Liquidity*. He started out by explaining that the concept of "excess liquidity" was in fact

not appropriate to describe the problem in China, and that the real problem was the excess availability of funds for lending. At the micro level, excess liquidity is not measurable. At the macro level, the concept of excess liquidity is defined by Keynes' concept of a liquidity trap, where the level of economic transactions is insensitive to decreases in the interest rate. Observable macroeconomic features of an economy in a liquidity trap would therefore be a downward trend in interest rates, as well as GDP recession. None of these is the case in China, which on the contrary runs a risk of overheating. A more appropriate description of the state of the Chinese economy is therefore a "surplus of investable funds" rather than "excess liquidity".

The fundamental way to solve the problem of surplus funds for lending is the reallocation of national income. This excess in funds stems from excess savings, which are a result of demographic change, an increase in the labour force, and rapid industrialization, among other factors. However, investments cannot absorb this high level of savings. During the period from 1992 to 2003, household savings have been declining, while corporate and especially government savings have increased. Household savings have been affected by an increase in taxes. Meanwhile corporate savings have been favoured by high profit margins, increases in efficiency and low costs as wages and interest rates remain low. Government savings have profited from higher tax revenues. Although government spending has increased, this has been slower than the increase in revenues.

Mr. Li also proposed that a temporary approach to deal with the excess in funds was to reform the foreign reserve management scheme. An increase in international reserves should not increase the money supply directly. The structure of the holdings should be diversified and an institute should be set up to manage the investments of foreign reserves. Bonds should be designed to de-couple international reserves from the money supply. In addition, the exchange rate should be allowed to fluctuate.

3.2 Trade

Mr. Ray Barrell (National Institute of Economic and Social Research) presented a paper entitled *Import Growth and the Impact of Globalisation*. He noted that the ratio of import growth to GDP growth rose substantially in the 1990's but fell back to its historical average in the early 2000's and wondered whether globalization could explain this in an empirical analysis.

Import volumes generally depend on demand, competitiveness and globalization/integration. Globalization leads to a changing nature of products, which increases cross border flows of goods. Regional integration and global trade agreements reduce barriers and also increase trade. If demand and relative prices alone drive imports, then this three variable system would cointegrate in a first step of the analysis. But if other factors are important it will not. Tariff reductions and the formation of the WTO, NAFTA and the EU with its single market programme and the EMU have removed barriers to trade and altered trade patterns. Variables such as these could cause intercept shifts in the system, which would then no longer cointegrate. These can be specified as dummy variables and tested for significance. It was found that many countries do not cointegrate without these globalization variables, but do when they are added.

The next step of the analysis was to embed the long run relationship, where import volumes depend on total final expenditure, relative prices, duties, and globalization variables, in an error correction formulation and then to estimate the model as a panel. A fixed effects panel estimation is inappropriate as there may be significant heterogeneity in the group of countries.

Consequently a Pooled Mean Group estimator (PMG) due to Pesaran, Shin and Smith (1999) was utilized that allows intercepts, short-run coefficients and error variances to differ across countries but constrains the long run coefficients to be the same. However, under PMG estimation, the equality of long run parameters was rejected. In addition, this strategy suffers from the difficulties of estimating a large number of elements in the variance covariance matrix and from the possibility that there may common factors in the error structure leading to bias. So a Common Correlated Effects (CCE) estimator due to Pesaran (2006) was employed, which removes these factors. Using this technique, common long run parameters could be imposed.

The results of the analysis show that globalization and trade liberalization have led to higher import growth relative to GDP growth since 1984. Regional integration and the formation of the WTO added about 1.5 per cent per annum to trade growth during the 1990's. Stable long run cointegrating relationships were obtained by adding measures of these trade liberalizing variables to the long run and using more advanced estimation techniques, yielding an income elasticity of demand of 1.5 per cent, much lower than in previous studies on the subject.

Mr. Sudip Ranjan Basu (UNCTAD) gave a presentation on *The E7 in International Trade: Dynamism and Cooperation*. Mr. Basu presented preliminary work that he is preparing for the UNCTAD VII 2008 Conference in Ghana on the emerging seven (E7) economies of Brazil, India, China, Mexico, Russia, South Africa and South Korea. The presentation discussed the growing importance of these economies in terms of output growth, population and labour force size, reserve accumulation and most notably growth of international trade.

Mr. Basu noted that the E7 economies represented 30 per cent of world trade in 2005; at the same time this growth performance is very much following the trend of world growth. He related this to Clive Granger's comment which shows that E7 growth follows closely that of world growth. He also said that there was a demographic dividend to be gained from the large population size in these economies, which represents 45.5 per cent of the world's population. Finally, there has been a significant accumulation of international reserves - since 1999 the share of E7 reserve accumulation in total reserves has almost doubled.

In these 7 economies, the drivers of globalization have been increasing trade and the growing importance of trade and FDI. However, the factors related to increased exports are quite varied across these countries. For example, Brazil's market share in exports is stemming predominantly from agriculture, while China's is dominated by manufacturing. This is important to analyze because when looking across these countries, the total contribution of the most dynamic sectors to total exports is very high. More than 65 per cent of exports are coming from the respective top 25 industries in each country, which suggests the importance of dynamism for trade. The dynamism of the export sector can be related to the factor intensity—which is a key for international trade. In India, for example, labour intensive and resource based commodities are the dominant exports; while exports from Mexico are dominated by manufactured goods with medium technology and skill intensity.

Finally, in a discussion on benchmarking, Mr. Basu suggested measures which the developed economies should implement in order to provide support for E7 to catch up, specifically in terms of relaxing tariff conditions on E7 economies in those products which are dynamic in these economies. A closer look at the factor intensities of predominant export goods in the E7, EU15 and US reveals that in EU15 and the US export dynamism stems from high and/or medium skilled factor intensive products, not from the more labour intensive products that

are more dominant in the E7. One way to improve the catching up of the E7 economies would be to improve market access by reducing tariffs, particularly on those goods which are important for exports. Thus, it is important to encourage negotiation to reduce tariff rates through the multilateral trading system (WTO); reduce supply side constraints, e.g. by building physical infrastructure and trade related institutions; and increase intra-E7 trade and cooperation among E7 countries, and strengthening bilateral trade potential.

Mr. Pei Changhong (CASS) began his presentation on the *The Historic Mission of the WTO and Responsibilities of China* with a discussion of the importance of WTO for China. Since China became a member of WTO in December 2001 the transitional period for membership has ended and two specific issues can be addressed: 1) how China understands its role in the WTO; and 2) how China has performed as member of the WTO. In China's strive for "harmonious development", both issues can be addressed in 3 aspects. Firstly, in the liberalization of trade, which requires all partners to oppose trade protectionism and pre-conditions for WTO talks, and to continue to give consideration to disadvantaged members during talks. Secondly, in the protection of international property rights (IPR). China has a complete set of laws and regulations governing IPR, but more important in this respect is enforcement, which still must be pushed. Finally, trading partners should make concerted efforts to push for trade liberalization. In this respect, China has since its accession met its commitments and responsibilities for the transitional period. For example, China has lowered tariffs sharply (the average dropped from 15.3 per cent in 2001 to 9.9 per cent in 2006); opened its service trade in areas such as banking, insurance, etc. (of the more than 160 service areas, China has opened 62.5 per cent); established a complete, open and transparent tariff quota management system in the area of merchandise trade; and strengthened protection of IPR.

Mr. Pei stressed that China has also taken a responsibility to reduce its trade surplus through a strategy of increasing imports rather than decreasing exports. This is because of the pattern of production in China, where exports are more reliant on transnational corporations than state owned enterprises. In this regard China is striving to: 1) establish a mechanism to coordinate and manage import trade and introduce import incentive mechanisms; 2) optimize the import mix and change the mode of import growth; and 3) optimize the import market structure and to strengthen the coordinating role of intermediary organizations. Overall, there should be harmony in trade relations and a relaunching of Doha talks in an effort to overcome different forms of trade protectionism, hegemonic policies and unilateralism. This will require concession and reconciliation, especially on the part of advantaged members.

3.3 Growth

Mr. André Dramais (European Commission) presented a paper entitled *Growth Determinant Analysis: A combination of Traditional and Bayesian Approach*. The empirical approach to the determinants of growth typically uses cross-country regressions on relevant indicators, such as education, high tech production, market distortions, taxes, etc., but the number of such indicators quickly becomes extremely large, and choices have to be made on as an objective basis as possible. Sala-I-Martin et al. (2004) used a Bayesian averaging of OLS estimates, whereby they estimated by panel regression all (or a substantial subset of all) possible models embedding k explanatory variables and then extracted the most relevant variables from a large dataset. Despite the incredible increase in computing power over the years, the methodology is still computationally demanding; the above study required 89 million OLS regressions.

The author utilized the same methodology on a different data base, the set of 30 OECD countries, and 50 indicator variables. The empirical results showed that while there may be a large number of factors affecting growth, it is difficult to find a large number that are statistically significant, either because it is difficult to accurately measure the influence or because the variables are imperfect proxies for the true significant variables. This latter problem was clearly in evidence in the education variable as a proxy for human capital. The education variable is expressed in flow terms (budgetary expenditures per level of education) but "human capital" should be an accumulated stock of education and knowledge, subject to depreciation.

As in the Sala-I-Martin et al. study, the Bayesian analysis did not prove to be a breakthrough. It still remains extremely heavy in computer time and vulnerable to the choice of priors, sampling methods etc. On the upside, the presence of clearly dominant variables and of multicollinearity was quickly recognised by the adaptive sampling method. Also the results indicated that it might be appropriate to relax the convergence criteria, which would significantly speed up the computation time by dropping unnecessary additional iterations.

Mr. Ji Chou (Shi Hsin University) presented a joint paper with Tsui-Chuan Huang on *Convergence and Divergence in the Information Era*. With the advent of the internet, ICT has become a major driver of global trade and growth, and income among economies seems to be converging. However, economies where people have limited access to information are being challenged by the competitive edge in this area held by the advanced economies, raising the question as to whether this innovation will widen or narrow the income gap between rich and poor countries.

Conventional convergence studies find that initially poor economies do grow faster than initially rich ones, so that convergence will happen eventually so long as poor economies can catch up in terms of technology. The "club convergence" school on the other hand stresses that poor economies are too poor to have the capability to catch up in terms of technology, so that divergence rather than convergence is the likely outcome.

The authors perform an empirical study to test convergence or divergence in the information era, finding results in favour of income convergence for a sample of 100 economies in the period of 1990-2003, a finding at odds with that of Mankiw, Romer and Weil (1992) and Barro and Sala-I-Martin (1992). Using the same model of convergence as these studies, where per capita income growth is explained by initial income, the investment ratio, the population growth rate, and human capital, the authors find that the null hypothesis of no significant effect for initial income, which is the key variable in the convergence model, cannot be rejected. However, when they add an index of digital access (DAI), compiled by the International Telecommunication Union, to the convergence model, initial income turns out to have a significant influence on the income growth rate. On the other hand, Mr Chou argued that this finding does not mean the rejection of the digital divide phenomenon. The authors re-formulated the model as a threshold model, where countries are sorted into two regimes, according to whether they have a DAI greater than a threshold value or not. They found that there is a statistically significant threshold and that the low DAI economies tend to converge and that there was a significant impact from information access, while high DAI economies did not show strong evidence of convergence and the impact from DAI was small and insignificant. This ran counter to the intuition that countries with good access to ICT should be converging. The authors speculated that with China and India in the low DAI group, but close to entering the high DAI

group, and with the small number of low DAI developing countries in the sample, the results may be biased.

During the open floor discussion, Mr. Stephen Hall (University of Leicester) commented that in both of the above papers there was a problem in the methodology underlying these growth results, which might lead to counterintuitive results. High growth is associated with low education, but this is misleading because high growth rate countries are poor and have low education. The problem is that the theory is in levels but the empirical work is done in differences, causing the empirical analysis to yield wrong results.

3.4 Environmental issues

Mr. William Meyers (University of Missouri-Columbia) presented a supply/demand model for the analysis of *The Market for Biofuels* and concluded that it seemed unlikely that biofuels would have a significant impact in energy markets, while they will have (and are already having) a big impact on agricultural markets.

The supply side of the model is constructed, as customary, by considering net returns, capacity, utilization and production as the product of capacity and utilization. From the supply side there is potential price volatility because capacity is largely determined in previous periods while the utilization rate is determined completely in the current period.

The demand side is constructed by adding horizontally demands for feed, fuel, stocks and exports and by considering the fluctuations in demand that arise when relative prices of ethanol with respect to gasoline change. Such relative prices change due to factors external to the market, like the price of crude oil in itself and changes in tax policy. The fact that these two may fluctuate independently of each other adds to overall market volatility.

Demand for feed tends to be overall rigid. For use as alternative fuel, at very low levels of demand there will be a quite rigid demand measured against the relative price of ethanol to gasoline, provided that the price of ethanol is lower than that of gasoline. Only at very low prices of ethanol relative to gasoline demand will turn out highly elastic.

The combined result hints at a potential for price volatility that will discourage production at a certain level due to constraints on profitability. Assuming no changes in policy and the continuation of tax credits, the ceiling in production will be about 12 billion gallons of biofuel (three times the present level) in less than ten years from now. However, further uncertainty could be introduced through changes in yields, trade conditions, domestic demand and input prices, complicating the conditions of the market and adding volatility.

In sum, biofuels are not expected to have significant influence on energy markets but the added volatility and uncertainty that this new market introduces may on the other hand affect the stability of agricultural markets and perhaps food provision.

Mr. Robert Kaufman (Boston University) presented a joint study on *Valuing Ecosystem Services: A Shadow Price for Net Primary Production*, which aims at estimating the contribution of the environment to economic activity, and to derive a methodology to propose a valuation system for “ecosystem services”.

In a first step, Mr. Kaufman introduced the notion of “ecosystem services” based on the contribution of the environment to the provision of goods, regulation activities and cultural services. He stressed that this method provides a more useful measure of the environment than conventional methods like direct market valuation, contingent valuation, hedonic prices or travel costs.

In a second step, the presenter derived a “net primary production” value from the concept of ecosystem services, which in can turn be incorporated into an augmented Cobb-Douglas production function which would allow a proper estimate of potential output. This was used by the authors for an empirical analysis for a sample of 77 countries over the period 1982-2000.

The results of this study are unambiguous and robust. Net primary production is significant for a variety of specifications where controls for fixed/random effects, time trends, education attainment, and other factors are introduced. Cointegration methods and an error correction approach is used as well, where net primary production is introduced as the error correction term, also showing a positive and significant influence on output.

Given these results, a shadow price for ecosystem services can be devised by taking the derivative of output with respect to net primary production. In addition, the price in each region would also depend on technology and the input mix.

Overall, the methodology allows for a meaningful estimate of the contribution of environmental services to production and income as well as for a measure of the relative scarcity of land in value terms. In addition, it allows to make assessments about the “limits to growth”, i.e. the point where the additions to GDP will be as costly as the use of environmental services.

During the open floor discussion, the following comments and questions were addressed to Mr. Kaufman: On a more technical level, it was pointed out that the error correction model aimed at estimating the contribution of the environment to GDP growth would need to be revised in order to address the mix of levels and flows in growth accounting. Likewise, it was noted that there remained some problems of double accounting since the so called environmental services are not fully separated from, say agricultural output. On the policy recommendations, some remarks were made about the substantive costs to the current world population if the full cost of environmental “use” were to be charged. An additional problem of paying full costs is that there is not one global price for environmental resources since these vary from country to country as the environment does not, in principle, cross borders. But price differentiation may make it more difficult to enforce a policy of this kind.

Comments on Mr. Meyers’ paper mostly addressed issues of technical precision of some estimates. In addition, the question was raised whether the solutions to avoid repercussions of biofuels on food supply should be policy- or market-driven. In response, Mr. Meyer cautioned that there seemed to be no single answer to this question. Market responses which worked for ethanol in Brazil, for example, might not work for maize and soy elsewhere.

3.5 Other selected issues

Ms. Pami Dua (Delhi School of Economics) presented joint work with Partha Sen on *Capital Flow Volatility and Exchange Rates: the Case of India*, discussing the impact of changes

in the level and volatility of capital flows on the Indian exchange rate in the post liberalization period.

Ms. Dua began her discussion by examining recent trends in India's capital flows within the global environment of increasing capital flows. Beginning in the 1990s there was an upswing in global capital flows due to liberalization of financial markets as well as innovation and the spread of ICT. Within this context, private capital flows increased considerably across the globe while official flows actually fell. In India, private capital flows almost trebled between the period 1990-94 and 2000-04. A large portion of these flows are portfolio equity flows and are short term in nature, thus increasing the exposure of countries such as India to volatility. As a result, exchange rate policies in India have evolved in an attempt to manage these large flows and prevent abnormal appreciation or depreciation pressures on the real effective exchange rate (REER).

The Indian exchange rate regime until 1990 was an adjustable peg. Shortly after the balance-of-payment crisis in 1991, a market determined exchange rate was put in place, which reverts to a 'managed' float when more chaotic situations occur in the market. Ms. Dua presented figures showing that the real effective exchange rate tends to move in tandem with the level and volatility of net capital flows during the period 1993 to 2004. The more volatile and higher the capital flows, the higher is REER. Empirical results based on a simple model estimation also confirmed these results.

In further empirical estimations, Ms. Dua tested for nonstationarity, Granger causality, and used an innovative accounting technique to estimate impulse response functions and forecast error variance decompositions. In her empirical results, she found that (among other things) all variables in the cointegrating vector Granger cause the real effective exchange rate, i.e. the lags of the variables improve the forecasting performance of REER. Regarding the forecast error variance decompositions, the results show that in order of importance the determinants of REER are net capital inflows and their volatility, government spending, current account surplus and money supply. For example, net capital inflows and their volatility explain about 27 per cent of variation over the forecast horizon. In addition, the generalized impulse response functions conform to the signs obtained in the cointegrating vector and shocks to each of the determinants have a long-run impact on REER, which is consistent with economic theory.

Mr. Pavlos Karadeloglou (ECB) gave a presentation on *A New Structural Model of the Global Oil Market* and discussed the changes to the ECB structural model for forecasting the price of crude oil. The ECB oil model had proved successful in the past in understanding oil price movements, but since 2004 the model has had less success, as oil prices have risen well above the level implied by the models fundamentals. He began the presentation by discussing the problems of the past structural model and then introducing new features to the present model as well as making an assessment of specific modelling issues.

One of the factors explaining the under-estimation of the increase in oil prices in the old model can be attributed to the quality mismatch between grades of crude oil supplies and which specific grades of crude oils refineries are able to process. Given limited refinery capacity for specific grades of crude, this may have an effect on crude prices, something that was not incorporated into the previous model.

Secondly, the change in the relationship between oil market fundamentals and prices as evidenced by the coordination between future spreads and inventory, introduces an element of inventory effect on oil prices. In this regard, the effects of stocks on oil prices may depend on conditions in the oil futures market. When the market is in contango, an increase in stocks may put additional downward pressure on the spot price.

Another change in the relationship between oil market fundamentals is that there are non-linearity between oil prices and supply delivered to the market. In this respect, the oil price is more sensitive to quantity supplied as it approaches production capacity. In the past, the use of linear specifications could have been the reason why this effect was not captured.

Therefore the new introductions into the model are: 1) the introduction of possible non-linearity in the relation between oil prices and OPEC capacity utilization; 2) the introduction of a refinery capacity indicator to account for quality mismatch (there is no quarterly indicator available globally, so the rise in US refinery capacity is used as a proxy); and 3) effects of stocks according to the contango vs. backwardation situation in the futures market. If futures prices are higher than current, then backwardation is apparent.

In the long run, the price of Brent crude is determined by many factors. In the short run, changes of variables mentioned in the long run affect the price, in addition to others such as the extent of quota-cheating by OPEC producers. The first results of the modelling exercise show that an increase in oil stocks lowers both demand and prices, while the rise in US refinery capacity has long run negative effect on prices. The relationship between capacity utilization and price has limited effects at the interim level, but as prices drop below this level or above, the price rises rapidly. For example in 2003, the sharp increase in capacity utilization led to a significant increase in oil prices.

Mr. Karadeloglou did a further assessment of the prices to determine the forecasting performance of the model. Testing the new model for in-sample and out-of-sample forecasts – both with and without correction of past forecast errors – against a random walk and futures prices, he found that for all cases, the forecast errors with the new model are lower than with different methodologies.

Finally, the presenter showed simulation results which tested the model's reactions to a series of shocks and made comparisons with previous results from the older model. The results showed that the impact on oil prices of a 1 per cent increase in GDP is higher in the new model, and the impact of a 0.5 per cent increase in refinery capacity utilization has a negative effect on price in the new model, verifying the validity of the new model.

Ms. Malinka Koparanova (UN DESA) gave a presentation on joint work with Hung-Yi Li on *Openness and Reforms in the CIS and China: Empirical Results from Gravity Models*. This work was motivated by the trend towards opening of the economies in the CIS region and China to the world economy in the last decade and by the way in which reforms in trade policies and exchange rate regimes have influenced these trade flows. In this respect, the presentation explored the strength of linkages between these economies and the role of trade policy in influencing these flows. In order to explore the linkages, the authors used a gravity model.

Ms. Koparanova noted that there have been major reforms in the CIS, which have impacted on trade activities - in the form of liberalization of political systems, prices and foreign

trade among others. In this respect, the role of the state has been withdrawn in the CIS, which contrasts sharply with China where the state still has a particularly strong role. In China there has been an explicit focus on policies to promote growth, and the role of the state is important both in the design and implementation of such policies; while in the CIS, the emphasis has been on market liberalization not growth.

Before presenting the modelling results, Ms. Koparanova showed the trends in trade performance in the CIS and China from 1995 to 2005. The trade performance in the CIS recovered in 1995 to 9 per cent average annual growth, but this is twice as low as China. However, there is variability across the CIS region, with Azerbaijan increasing from 35 to 57 per cent in 2005 and 2006, coupled with a 25 and 30 per cent growth rate of GDP. Regarding the level of openness between CIS and China, there is a tendency of increased openness in CIS to China, particularly in economies such as Kazakhstan and Ukraine that export a considerable amount of raw materials to China.

In general, gravity models are used to explain the size of trade between countries similar to the force of gravity in Newtonian physics, i.e. trade based on distance. There was a renaissance of these models in studies in the 1990s, but only two such studies have used gravity models in an application to openness. The strategy used in this presentation was the estimation of several specifications of the gravity model progressively adding more components. In this regard, the model started with the standard form, relating openness to GDP and distance and progressively adding more variables, such as population and trade policy index. The openness variable was measured as share of trade in (sum of exports plus imports) in GDP and data are for the period 1993-2005, based on export and import data from the UN COMTRADE dataset.

The main results of the estimation show that the model worked well and gave precise income and distance elasticities. Also, adding more variables delivered plausible estimates of other effects in the augmented model. First, the results show that there is a general pattern of trade linkages between the CIS and China: there is a positive relationship between GDP and openness (elasticity close to one), but a negative relationship between distance and openness, suggesting that there are adverse effects of distance which could reflect the high transport costs in the CIS. The fit of the model and the estimates, however, improved considerably as trade variables were added. This suggests that progress in trade between the CIS and China is largely driven by advances in foreign exchange, and trade liberalization, facilitation within the WTO and output growth. Finally, the estimates also suggest that there is more integration between the CIS and the EU than between the CIS and China as indicated by a larger impact of income, population and distance on openness of the CIS to the EU compared to the CIS and China.

4. Economic modelling issues

4.1 Evaluation of global econometric models

The Lawrence R. Klein lecture was on the topic of *Evaluation of Global Econometric Models* and was delivered by **Mr. Clive Granger (University of California at San Diego)**, a co-recipient of the Nobel Prize in economics in 2003 with Robert F. Engle for the development of techniques for analyzing time-series data with common trends – cointegration.

He started his lecture by emphasizing his respect for Lawrence Klein for the enormous task of building models that capture economic activity worldwide for many years. His speech

focused on global models, and in particular on how to evaluate such models. It is possible to build a simple global model – for example by using global GDP, global consumption, an index of global interest rates or commodity prices as global time-series. Another approach is to have a model for every country – such as in the LINK model – although these models will vary by country owing to different quality and frequency of data, as well as different underlying theories. Hence, it is difficult to build the same type of model for all countries. On the other hand, it is difficult to aggregate models of different types.

To overcome this problem, Mr. Granger proposed to start with models of a few countries only – which produce over 50 percent of world output (for example the G8, India and China). The first step of such an approach will be to construct good models for those countries. As a second step he proposed to build group models that are less complicated, such as in the old LINK model.

He also noted that it is important to make these models publicly available to be used both as a teaching tool and as a framework for different scenarios. However, before using these models it is crucial to evaluate them. Depending on the purposes of the models – for forecasting, policy evaluation, or analyzing general questions – the approaches vary. For forecasting models for example, one approach will be to evaluate the model over different horizons, or combine the forecast of various models (through average weights). It is then up to the decision-makers to select the most successful models.

Comparing models for policy evaluation is more difficult, since it concerns real events and not only the effect of a variable on the economy, which is evaluated against the theoretical framework of the long-term equilibrium, as is the case for an impulse response function. Most importantly, long-run equilibrium delivers results over a longer period, while what one is interested in is usually the effect on the real economy in a three-month, or up to two-year period, for example the effects of an increase in oil prices, or another substantial shock on the economy. Evaluation of the quality of the data also poses obstacles as it is reflected in the error term.

In conclusion, Mr. Granger emphasized two major aspects in modelling: the need to put more efforts on the evaluation and less on the construction of models, and to keep several competing models with different perspectives (“thick modelling”).

4.2 Macroeconomic modelling for policy analysis

Mr. Stephen Hall (University of Leicester) presented a joint paper with Ali J. Al-Eyd on *Financial Crises, Effective Policy Rules and Bounded Rationality in a New Keynesian Framework*. The main focus of the paper is on examining different policy rules – under rational expectations (RE) and adaptive learning (AL) – during periods of financial crises. Within an extended new Keynesian model, a third generation “balance sheet” effect is made operational through an endogenous risk premium which affects investment.

After discussing the policy debate – both the “traditional” view (IMF-prescribed) and the “revisionist” view – he presented a dynamic small open economy model. The model is similar to the NK model of Svensson, augmented by demand side endogenous risk premia effects on investment. It is estimated/calibrated using quarterly data for Thailand as a representative case of the Asian financial crises 1997-98. To capture the currency effects, the endogenous risk premium reflects changes in the stock of total foreign indebtedness as a ratio of real output, and its

dynamics is transferred by a simple interest parity relation. The policy rules in the model are grouped into two sets. The first set includes “fixed rules”, which are traditional rules of the Taylor variety and maintain their functional form throughout the simulation horizon independent of the nature of the shock. The second set includes “non-linear” policy rules, which change their form according to the size and nature of the shock. Therefore the switch between these two sets allows for asymmetric policy responses and hence is close to the real process of decision-making. In fact, it is through the switching mechanism that the views of “traditionalists” and “revisionists” are incorporated into the model. To explore alternative policy rules in Thailand, a simulation over the sample was run where the implicit policy rule was replaced by alternative rules, allowing for comparison between the policy actually implemented and the results of the alternative rules. Simulations are run over the period 1995 – 2000 (quarterly) under both RE and AL.

Mr. Hall noted that since the objective of the policy is to stabilize the economy at pre-crises levels, the average squared deviation from the 1995 value of a series (interest rates, real GDP, inflation and exchange rate) is estimated, which is then further subjected to minimization. Afterwards, the rules are ranked by each variable.

Summarizing his main findings, he highlighted that both under the RE and AL the Taylor rule is the welfare superior policy. Policy rules, including the exchange rate, generally outperform the inflation forecast rules, especially under the AL. As an additional finding, the learning model is much more volatile. “Traditionalist” policy does well under RE and is much more effective at mitigating exchange rate variability, while “revisionist” policy is more effective at mitigating real output variability.

Mr. Marco Cavalcanti (Institute of Applied Economic Studies) presented a paper on *Credit Market Imperfections and the Power of the Financial Accelerator*. To evaluate how different types of credit market imperfections affect the degree of shock amplification arising from the so-called financial accelerator, he introduced the framework of a closed-economy, sticky-price dynamic stochastic general equilibrium model with two types of credit market imperfections: costly contract enforcement and anti-creditor bias in the judicial system. One important theoretical finding of his model is the prediction that each type of credit market imperfections has different implications for the financial accelerator mechanism. Specifically, the power of the financial accelerator increases monotonically with contract enforcement costs and non-monotonically with the anti-creditor bias in the judicial system.

In addition, Mr. Cavalcanti presented some empirical evidence supporting the predictions of his model, such as increases in macroeconomic volatility due to imperfections related to contract enforcement. The empirical analysis is based on panel data from 62 countries over the period 1981-1990.

He concluded with predictions for the effects of financial reforms in different countries, based on the theoretical findings and supported empirically. In particular, for countries with a low level of credit market frictions, financial reforms targeting reduction of such imperfections are likely to decrease macroeconomic volatility. On the other hand, for countries with a significant level of credit market frictions, macroeconomic volatility is likely to remain almost constant in the face of lower contract enforcement costs and increase as a result of a reduction in the anti-creditor bias in the judicial system.

Mr. Eilev Jansen (Statistics Norway) presented a joint paper with Roger Bjørnstad entitled *The NOK/Euro Exchange Rate After Inflation Targeting: The Interest Rate Rules*, which discusses the effects of a regime change from exchange rate targeting to inflation targeting in Norway. In March 2001, Norway adopted a flexible inflation target, after a long period during which the central bank targeted the exchange rate in various forms. Exchange rate volatility has been higher since then.

The model used for analysis follows from Bjørnland and Hungnes (2006) who found a stable equilibrium correcting relationship for the NOK for 1983q1 to 2002q2. The long run relationship is a PPP condition augmented by the uncovered interest parity condition. However, the model breaks down after 2002q2, four quarters after the introduction of the new monetary regime. The authors extend this work by adding interaction terms between changes in the interest rates and a step dummy for the regime shift, and examining the relation in a larger sample that includes the period of regime shift.

The main finding is that the regime shift mattered - the introduction of the inflation target changed the way the NOK/euro exchange rate is determined - but the changes were confined to the short-run interest rate effects, while the long run equilibrium condition remained the same. For the short run, the speaker found that the short-term effect of interest rates interacting with the step dummy rendered the interest rate variables themselves insignificant, consistent with the findings of the breakdown in the Bjørnland and Hungnes model after 2002q2. In addition, the signs of the short term interest rate effects changed. The speaker interpreted this as follows: The regime shift reversed the causal ordering between changes in the nominal exchange rate and changes in the interest rate. When the central bank targets the exchange rate, interest rates are rarely changed independently of foreign interest rates, and only to counteract large movements in the exchange rate after interventions have failed to stabilize the exchange rate. With inflation targeting, the interest rate is used to stabilise the domestic economy and has a strong impact on the exchange rate. The long run relationship between the interest rate and the exchange rate is on the other hand not altered by the change in monetary policy regime. This means that the fundamental equilibrating mechanism - that is the PPP condition augmented with a risk premium - remains the same across regimes.

Mr. Jansen concluded by pointing out two important caveats. First, the number of observations available after the regime shift is still small and does not allow post sample evaluation. Second, the role of expectations in the determination of the exchange rate may not be fully captured. A change in core inflation may be perceived as a signal of future interest rate changes by the agents in foreign exchange markets: an increase in core inflation is likely to be met by an subsequent increase in interest rates by the central bank. More importantly, the effect of an interest rate change on the exchange rate may be different and stronger if it comes as a surprise to the agents as compared to the case where it is anticipated.

4.3 Other selected modelling issues

In his joint work with Heinz Glück on *Real-time Data Based on OECD and IMF Projections*, **Mr. Stefan Schleicher (University of Graz)** pursued the question whether a sequence of observed real-time data provides useful information. After testing for reliability and bias of a sequence of real-time GDP forecasts in relation to final observations, the authors go on to compare OECD and IMF forecasts. They find strong evidence of common errors between the two agencies' forecasts, but little correlation of forecast errors between different countries.

The forecast values for a specific target year at any point in time are constructed by applying a fading memory process to the first and second moments of the sequence of forecast values up to that point in time. This mechanism yields measures of correlation and bias when compared to the last reported (final) data for the target year. Studying a selection of OECD countries, one of the authors' main findings is that only the first forecast in the target year contains valuable information about the final data, while the correlation between forecasts one year before the target year and the final data is close to zero. In addition, forecasts tend to be biased downward, thus systematically underestimating GDP. Another finding was a decrease in the correlation between the first forecasts in the target year and the final data over recent years, while biases have improved. In the second step of his analysis, Mr. Schleicher showed the existence of strong common errors between OECD and IMF forecasts, basically making them good predictors for each other. On the other hand, he failed to find common forecasting errors between different countries.

Summing up, Mr. Schleicher pointed out that real-time data can be useful for monitoring OECD and IMF forecasting performance, and for identifying and addressing systemic forecasting biases in order to improve forecast performance.

During the discussion, it was pointed out that it should not come as a surprise that GDP growth forecasts prior to the target year are uncorrelated with the final data, since forecasts are always smooth while actual data are not. This would also explain the fact that the first forecasts in the target year are indeed correlated with the final data, since they account for first quarter volatility as it deviates from the past. Another question was raised as to whether it might be more useful to compare the forecast sequence with the first published data as opposed to the final (revised) data, in order to exclude the effects of potentially large ex-post revisions.

In his presentation on *Time-Varying Lag Operators: Theory and Application to Measure Business Cycle Synchronization Among EU Members*, **Mr. Viktor Várpalotai (Corvinus University of Budapest)** suggested introducing fractional lags in time series analysis, and allowing them to vary over time to capture structural changes in economic relations. In a first step, he developed the theoretical framework for such time-varying fractional lags and derived an empirical estimator. In a second step, he applied this approach to analyze the synchronization of business cycles of EU member countries relative to the European Monetary Union (EMU) aggregate.

The introduction of a fractional time lag is a straightforward way to address inconsistent parameter estimates that may result from using incorrect timing specifications in an econometric model. The appropriate order of lags/leads would then be estimated in analogy to the estimation of "normal" parameters. In addition, the estimated fractional lag is allowed to vary over time, in line with the recent trend towards time-varying parameter models, which allow for continuous changes in the economic relations under consideration. A thus specified time series model is estimated by using a Bayesian approach, resulting in estimators for coefficients as well as for lags. Applying this estimation technique in a business cycle synchronization (BCS) model with artificially created data, and comparing root mean squared errors, shows that it provides a better fit to the data than standard BCS analysis, using a multiple-year rolling sample and determining the lead/lag structure through model selection.

Mr. Várpalotai's BCS analysis of EU and EMU countries, using time-varying fractional lags, yields the following results: Business cycles are highly synchronized between EMU members, even more so since 1999, after a temporary divergence between 1995 and 1999 during the running up to the introduction of the euro. In contrast, business cycles are heterogeneous in the Central and Eastern European Countries, among which only Estonia, Hungary and Slovenia exhibit some synchronization with the EMU zone. Out of the control group, Denmark, Switzerland and the United Kingdom are showing strong synchronization with the EMU zone, while this is less evident for Norway and Sweden. The United States leads EMU by roughly two quarters.

In reply to a question on how this elaborate estimation procedure was superior to simply adding a discrete higher-order lag to the time series model, Mr. Várpalotai argued that the estimation of time-varying fractional lags yields more precise results and thus helps to avoid wrong conclusions about the underlying economic relations.

Mr. Suleyman Ozmucur (University of Pennsylvania) presented work in progress on a *Current Quarter Model for Turkey*. The main goal of such a model is to address the long delays in the release of quarterly GDP data, by using available higher-frequency data to create timely forecasts and regular updates of current quarter data. Specifically, a VAR model for quarterly year-over-year GDP growth and inflation is estimated, and enhanced with estimates of principal components from monthly indicators.

The enhanced quarterly VAR model is estimated in levels of GDP and changes in inflation, including 1, 4, and 5 period lags, and the quarterly averages of the year-over-year changes in ten selected monthly indicators. Including the monthly indicators improves the fit of the model as compared to the non-enhanced VAR model, as indicated by an increase in the R-squared and a reduction of residual correlation to near zero. Also, the enhanced quarterly VAR model outperforms alternative models for growth and inflation, such as ARIMA, in an in-sample forecast comparison, as indicated by the Diebold-Mariano statistic.

Further steps to improve on fit and forecasting properties will be an analysis of out-of-sample forecasts and the inclusion of additional short-term indicators, such as volume indicators of trade.

During the discussion, Mr. Ozmucur clarified that year-over-year changes in data were used instead of quarterly annualized data in order to ensure comparability with data released by the national statistical office, which reports seasonally unadjusted year-over-year changes.

Project LINK Spring Meeting 2007
Chinese Academy of Social Sciences
Jianguo Garden Hotel, Beijing
May 14-17, 2007

FINAL AGENDA

Monday, May 14, 2007
(Jianguo Garden Hotel)

9:00-9:15

Opening Ceremony

Chair: Pingfan Hong

Wang Changsheng, Director, State Information Center
Peter Pauly, University of Toronto

9:15-10:00

Lawrence R. Klein Lecture:

Chair: Pingfan Hong

Evaluation of Global Econometric Models
Clive Granger, University of California at San Diego

10:00-10:15

Tea break

10:15-12:15

World Economic Outlook

Chair: Bert Hickman

UN/LINK Global Economic Outlook
Robert Vos, United Nations, New York

IMF Global Outlook
Timothy Callen, IMF, Washington

Comments on the Global Outlook:
Carl Weinberg, High Frequency Economics, New York

Yu Yongding, Director, Institute of World Economics, Chinese Academy of Social Sciences, Beijing

General Discussion

12:15 – 1:15

Lunch

1:15 **Transportation to Great Hall of the People**

14:30-17:30

(Great Hall of the People)

Joint CASS Forum and Project LINK Session

Chair: Wang Tongsan

Opening Address

Leng Rong, Executive Vice-President, Chinese Academy of Social Sciences

From High-speed Growth to Harmonious Development – Review and Prospect for China's Economy

Chen Jiagui, Vice-President, Chinese Academy of Social Sciences

A Comparison of Economic Growth Between China and India

Clive Granger, University of California at San Diego

Economic Growth in China and Its Sustainability

Laurence R. Klein, University of Pennsylvania [video]

China's Economic Situation

Xie Fuzhan, Commissioner, National Bureau of Statistics of China

Global Economic Imbalances Re-Examined

Peter Pauly, University of Toronto

International Policy Coordination for the Adjustment of Global Imbalances

Robert Vos and Pingfan Hong, United Nations, New York

Evening: Banquet hosted by Chinese Academy of Social Sciences

Jianguo Garden Hotel, 2nd Floor, 6:30 pm

Tuesday, May 15, 2007

(Jianguo Garden Hotel)

9:00 – 10:30

Global Imbalances and China's Role in the International Financial System

Chair: Duncan Ironmonger

Bank Reform in China: What It Means for the World

Donald Brean, University of Toronto

Two Basic Strategies to Cope With the Problem of Excess Liquidity

Li Yang, Director, Institute of Finance and Banking, Chinese Academy of Social Sciences, Beijing

General Discussion

10:30 – 10:45

Tea break

10:45-12:30

The Global Trading System

Chair: Delia Nilles

Import Growth and the Impact of Globalization

Ray Barrell, Iana Lindze, and Olga Pomerantz, NIESR, London

The E7 in International Trade: Dynamism and Cooperation

Sudip Ranjan Basu, UNCTAD, Geneva

The Historic Mission of the WTO and Responsibilities of China

Pei Changhong, Director, Institute of Finance and Trade, Chinese Academy of Social Sciences, Beijing

12:45 – 13:45

Lunch

14:00 - 15:30

World Economic Outlook and Regional Perspectives

Chair: Carlo D'Adda

Industrial Countries Overview

Ray Barrell, NIESR, London

Country Presentation:

US : Lawrence R. Klein, University of Pennsylvania (video)

World Commodity Markets: Prospects and Risks

F. Gerard Adams, Northeastern University, Boston
Willy Meyers, University of Missouri-Columbia
Robert Kaufmann, Boston University

Perspectives from National Participants

15:30 – 15:45

Tea break

16:00 – 17:30

Macroeconomic Modeling for Policy Analysis

Chair: Thomas Wilson

Financial Crisis, Effective Policy Rules and Bounded Rationality in a New Keynesian Framework

Ali Al-Eyd and Stephen Hall, University of Leicester

Credit Market Imperfections and the Power of the Financial Accelerator

Marco Cavalcanti, IPEA, Rio de Janeiro

The NOK/Euro Exchange Rate After Inflation Targeting: The Interest Rate Rules

R. Bjørnstadt and E. Jansen, Statistics Norway, Oslo

Evening: Banquet hosted by the National Bureau of Statistics

Beijing International Hotel, 6:30 pm

Wednesday, May 16, 2007

(Jianguo Garden Hotel)

9:00 – 10:30

Global Economic Issues: Emerging Markets

Chair: Jan van Heerden

World Bank Emerging Markets Overview

Hans Timmer, World Bank, Washington

Panel Discussion on Emerging Market Outlook

Keiji Inoue, United Nations, New York,

Kenneth Ruffing, OECD/ADB, Paris

Léonce Ndikumana, UNECA, Addis Ababa

Cornelia Kaldewei, United Nations, New York

Perspectives from National Participants

10:30 – 10:45

Tea break

10:45 – 12:30

Global Growth and Environmental Issues**Chair: Mette Rolland**

Growth Determinants Analysis: A Combination of Traditional and Bayesian Approach
Andre Dramais, Commission of the EC

Convergence or Divergence in the Information Era
Ji Chou and Tsui-Chuan Huang, Shi Hsin University

The Market for Biofuels
Willy Meyers, University of Missouri-Columbia

Valuing Ecosystem Services: A Shadow Price for Net Primary Production
Amy Richmond, Robert Kaufmann, and Ranga B. Myneni, Boston University

12:45 – 13:45

Lunch

14:00 – 15:30

Applied Economic Issues**Chair: Adolfo Castilla**

Capital Flow Volatility and Exchange Rates: the Case of India

Pami Dua and Partha Sen, Delhi School of Economics

A New Structural Model of the Global Oil Market
S. Dees, A. Gasteuil, P. Karadeloglou, and R. Kaufmann, European Central Bank, Frankfurt and Boston University

Openness and Reforms in the CIS and China: Empirical Results from Gravity Models
Malinka Koparanova and Hung-Yi Li, United Nations, New York

15:30 – 15:45

Tea break

15:45 – 17:15

Contributed Papers on Modeling Issues**Chair: Alexander Welfe**

Real-time Data Based on OECD and IMF Projections
Heinz Glueck and Stephan Schleicher, Austrian National Bank and University of Graz

Time-Varying Lag Operators: Theory and Application to Measure Business Cycle Synchronization Among EU Members

Viktor Varpalotai, Bank of Hungary, Budapest

Current Quarter Model for Turkey

Suleyman Ozmucur, University of Pennsylvania, Philadelphia

17:15 – 17:30

Closing Session

Evening: Banquet hosted by the Ford Foundation and the Chinese Association of Quantitative Economics

Please gather in the lobby of the Jianguo Garden Hotel at 6:00pm to be bussed to location.

Thursday, May 17, 2007

Full day excursion to the Great Wall

Evening: Banquet hosted by the State Information Center

Labour Culture Palace, please gather in the lobby of the Jianguo Garden Hotel at 6:00pm to be bussed.

LIST OF COUNTRY REPORTS

NO.	Angola	Suzy Camacho
1	Argentina	Arturo O'Connell
2	Austria	Ulrich Schuh
3	Australia	P. Brian & D. Ironmonger
4	Angola	Suzy Camacho
5	Belgium	Simon Erlich
6	Brazil	L.M. carvalho/M. Cavalcanti
7	Bulgaria	Garabed Minassian
8	China	Liping Tao
9	China	Lawrence Klein
10	Colombia	Natalia Salazar
11	Costa Rica	J. Vargas/O. Saenz
12	Croatia	Danijel Nestic
13	Denmark	Grane Høegh
14	Estonia	Ilmar Lepik
15	Germany	G. Barabas/ R. Døhrn
16	Ghana	Cletus Dordunoo/K. Chekpeche
17	Greece	Stella Balfoussias
18	Hungary	Andras Simon
19	Ireland	Suzanne Linehan
20	Italy	Carlo D'Adda
21	Japan	Kanemi Ban
22	Korea	Sukha Shin
23	Malaysia	Muthi Samudram
24	Mexico	Alfredo Coutino
25	Norway	T. Eika / M. Rolland

26	Poland	Wladyslaw Welfe
27	Romania	C. Ciupagea
28	Russia	K. Mikhaylenko
29	Slovak Republic	Jan Haluska / Michal Olexa
30	Slovenia	J. Mencinger
31	South Africa	Walter de Wet
32	Switzerland	Delia Nilles
33	Taiwan	Chung-Shu Wu
34	Togo	Kodjo Evlo
35	Turkey	Suleyman Ozmucur
36	Ukraine	V. Heyets / M. Skrypnychenko
37	Venezuela	Cristina Rodríguez

LIST OF FORECASTS

NO.	NAME OF THE COUNTRY	NAME OF AUTHOR
	Angola	Suzana Monteiro
	Australia	Duncan Ironmonger
	Austria	Ulrich Schuh
	Belgium	S. Elrich
	Bulgaria	Garabed Minassian
	Canada	Steve Murphy
	China	Tao Liping
	Colombia	Natalya Salazar
	Costa Rica	Juan-Rafael Vargas
	Czech Republic	Milan Klima
	Denmark	Grane Hoegh
	Estonia	Martin Lindpere
	Finland	Hannu Viertola
	Ghana	Cletus Dordunoo
	Greece	Stella Belfoussias
	Hong Kong	Chou Win Lin
	Ireland	Linehan Suzanne
	Israel	Idit Sheinin
	Japan	Ban Kanemi
	Korea	Sukha Shin
	Malaysia	Muthi Samudram
	Mexico	Alfredo Coutino
	Nigeria	Samuel Olofin
	Norway	Andreas Benedictow
	Philippines	Dennis Arroyo
	Poland	Waldemar Florczak

	Romania	C. Ciupagea
	Russia	K.V. Mikhailenko
	Singapore	Toh Mun Heng
	Slovakia	Michal Olexa
	Slovenia	Jose Mencinger
	Spain	Adolfo Castilla
	Sudan	Faiza Mohamed Osman
	Switzerland	Delia Nilles
	Taiwan Province of China	Henry Lin
	Togo	Kodjo Evlo
	Turkey	Suleyman Ozmucur
	Ukraine	Valeriy Heyets
	Venezuela	Christina Rodriguez
	Zambia	Noah Mutoti
	Zimbabwe	Joseph Mverecha

LIST OF PARTICIPANTS

Suzana Maria de Fatima Camacho Monteiro
 Banco Nacional de Angola
 Avenida 4 de Fevereiro 151
 Luanda CP 1243, ANGOLA
 tel: 244-2-337-7817
 fax: 244-2-337-817
 e-mail: suzycamacho@yahoo.com

Duncan Ironmonger
 Department of Economics
 University of Melbourne
 Victoria 3010, AUSTRALIA
 tel: 613-8344-2131
 fax: 613-9349-4291
 e-mail: dsi@unimelb.edu.au

Heinz Glück
 Economic Studies Division
 Austrian National Bank
 P.O. Box 61, A - 1011
 Vienna, AUSTRIA
 tel: 43-1-40420-7201
 fax: 43-1-40420-7299
 e-mail: heinz.glueck@oenb.co.at

Stefan Schleicher
 Economics Department
 University of Graz
 Universitaets Str. 15/F4
 A-8010 Graz, AUSTRIA
 tel: 43-316-380-3440
 fax: 43-316-380-9520
 e-mail: Stefan.Schleicher@wifo.at

Ulrich Schuh
 Department for Economics and Finance
 Institute for Advanced Studies
 Stumpergrasse 56
 A-1060 Vienna, AUSTRIA
 tel: 43-1-59-991-148
 fax: 43-1-59-991-163
 e-mail: schuh@ihs.ac.at

Salahuddin Ahmad
 Dean, School of Business
 Uttara University
 House 11 Road 7D, Sector 9, Uttara
 Dhaka - 1230, BANGLADESH
 tel: 880-2-895-0014
 fax: 880-2-891-3501
 e-mail: I_d_p_i@yahoo.com

Andre Dramais
 European Commission
 BU1 3/123
 1049 Brussels, BELGIUM
 tel: 32-2-299-7719
 fax: 32-2-295-7499
 e-mail: andre.dramais@ec.europa.eu

Marco Cavalcanti
 IPEA/DIMAC
 Av. Antonio Carlos 51, sala 1407
 Rio de Janeiro - RJ 20020-010, BRAZIL
 tel: 55-21-3515-8589/2549-6903
 fax: 55-21-2240-1920/2549-6903
 e-mail: cavalcanti@ipea.gov.br

Garabed Minassian
 Institute of Economics
 Bulgarian Academy of Sciences
 3, Aksakov Str.
 1040 Sofia, BULGARIA
 tel: 359-2-957-2419
 fax: 359-2-988-2108
 e-mail: minasian@mail.techno-link.com

Don Brean
 University of Toronto
 105 St. George St.,
 Toronto, ON M5S 3E6, CANADA
 tel: 416-978-3754
 fax:
 e-mail: brean@rotman.utoronto.ca

Thomas Wilson
 Institute for Policy Analysis
 University of Toronto
 140 St. George St., Suite 325
 Toronto, Ontario M5S 3G6, CANADA
 tel: 416-978-4458
 fax: 416-971-2071
 e-mail: twilson@chass.utoronto.ca

PEI Changhong
 Director, Institute of Finance and Trade Economics
 Chinese Academy of Social Sciences
 2, Yuetanbeixiaojie
 Beijing 100836, CHINA
 tel: 86-10-6804-7514
 fax: 86-10-6802-7442
 e-mail: peich@cass.org.cn

Erin Bell
 Institute for Policy Analysis
 University of Toronto
 140 St. George Str., Suite 325
 Toronto, Ontario M5S 3G6, CANADA
 tel: 416-978-5353
 fax: 416-971-2071
 e-mail: ebell@chass.utoronto.ca

Peter Pauly
 Institute for Policy Analysis
 University of Toronto
 140 St. George St., Suite 325
 Toronto, Ontario M5S 3G6, CANADA
 tel: 416-978-4331
 fax: 416-971-2071
 e-mail: pauly@chass.utoronto.ca

ZHU Baoliang
 Department of Economic Forecasting
 State Information Center
 58, Sanliheli
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-8127
 fax: 86-10-6855-8210
 e-mail: zhubl@mx.cei.gov.cn

WANG Changsheng
 Chief Executive Director
 State Information Center
 58, Sanliheli
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-8931
 fax: 86-10-6855-8210
 e-mail: cswang@mx.cei.gov.cn

LI Dan
Deputy-Director, Office of International,
Chinese Academy of Social Sciences
5, Jianguomennei Street,
Beijing 100732, CHINA
tel: 86-10-8519-5135
fax: 86-10-8519-6152
e-mail: lidan@cass.org.cn

SAN Feng
Department of Economic Forecasting
State Information Center
No. 58 Sanliheli
Xicheng District
Beijing 100045, CHINA
tel: 86-10-6855-7120
fax: 86-10-6855-8210
e-mail: sanfeng@mx.cei.gov.cn

GAO Huiqing
Department of Economic Forecasting
State Information Center
No. 58 Sanliheli
Xicheng District
Beijing 100045, CHINA
tel: 86-10-6855-7134
fax: 86-10-6855-8210
e-mail: ghq@mx.cei.gov.cn

QI Jianguo
Deputy-Director
Chinese Academy of Social Sciences
5, Jianguomennei Street,
Beijing 100732, CHINA
tel: 86-10-8519-5703
fax: 86-10-6512-6118
e-mail: jgq222@163.com

LI Jifeng
Department of Economic Forecasting
State Information Center
No. 58 Sanliheli
Xicheng District
Beijing 100045, CHINA
tel: 86-10-6855-7128
fax: 86-10-6855-8210
e-mail: lijf@mx.cei.gov.cn

WAN Donghua
Deputy-Director-General, Senior Statistician
National Bureau of Statistics China
No. 57, Yuetannanjie, Sanlihe
Xiecheng District
Beijing 100826, CHINA
tel: 86-10-6878-2372
fax: 86-10-6878-2374
e-mail: wandh@stats.gov.cn

XIE Fuzhan
Commissioner
National Bureau of Statistics
No. 57, Yuetannanjie Sanlihe
Xicheng District
Beijing 100826, CHINA
tel: 86-10-6878-331
fax: 86-10-6853-3618
e-mail:

CHEN Jiagui
Vice-President
Chinese Academy of Social Sciences
5, Jianguomennei Street,
Beijing 100732, CHINA
tel: 86-10-8519-5058
fax: 86-10-8519-6110
e-mail: chenjg@cass.org.cn

Wu Jiapei
State Information Center
No. 58 Sanliheli
Xicheng District
Beijing 100045, CHINA
tel: 86-10-6855-7000
fax: 86-10-6853-39197
e-mail: jiapeiwu@netchina.com.cn

ZHENG Jingping
General-Engineer, Senior Statistician
National Bureau of Statistics
No. 57, Yuetannanjie, Sanlihe
Xicheng District
Beijing 100826, CHINA
tel: 86-10-6878-3311
fax: 86-10-6853-3618
e-mail:

ZHAO Kun
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7128
 fax: 86-10-6855-8210
 e-mail: zhaokun@mx.cei.gov.cn

SUN Lin
 International Department
 Ministry of Finance
 3, Nansanxiang, Sanlihe
 Xicheng District
 Beijing 100820, CHINA
 tel: 86-10-6855-3167
 fax: 86-10-6855-2589
 e-mail:

TAO Liping
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Beijing 100045, CHINA
 tel: 86-10-6855-8128
 fax: 86-10-6855-8210
 e-mail: taolp@mx.cei.gov.cn

ZHU Ming
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7122
 fax: 86-10-6855-8210
 e-mail: capm@mx.cei.gov.cn

ZHANG Minwen
 International Department
 Ministry of Finance
 3, Nansanxiang, Sanlihe
 Xicheng District
 Beijing 100820, CHINA
 tel: 86-10-6855-3167
 fax: 86-10-6855-2589
 e-mail:

NIU Li
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7129
 fax: 86-10-6855-8210
 e-mail: niuli@mx.cei.gov.cn

FU Linghui
 Principal Staff Member
 National Bureau of Statistics China
 No. 57, Yuetannanjie, Sanlihe
 Xiecheng District
 Beijing 100826, CHINA
 tel: 86-10-6878-2376
 fax: 86-10-6878-2445
 e-mail: flh@stats.gov.cn

SHEN Lisheng
 Institute of Quantitative and Technical Economics
 Chinese Academy of Social Sciences
 No. 5 Jianguomennei Street
 Beijing 100732, CHINA
 tel: 86-10-6513-7512
 fax: 86-10-6512-6118
 e-mail: shenls@cass.org.cn

YAN Ming
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7127
 fax: 86-10-6855-8210
 e-mail: yanmin@mx.cei.gov.cn

ZHANG Peng
 Department of Economic Forecasting
 State Information Centre
 58, Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-8128
 fax: 86-10-6855-8210
 e-mail: siczp@mx.cei.gov.cn

XU Pingsheng
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7121
 fax: 86-10-6855-8210
 e-mail: xupsh@mx.cei.gov.cn

HAN Shengjun
 Deputy-Director, Office of Research Management and
 Coordinating
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-6513-7561/8519-5705
 fax: 86-10-6512-6118
 e-mail: hansj@cass.org.cn

WANG Tong
 State Information Center
 58, Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-1-6855-7000
 fax: 86-1-6853-3919
 e-mail: wangtong@cei.gov.cn

Andrew Watson
 Representative, Professor
 The Ford Foundation
 Suite 501, International Club Office Bldg.
 No. 21 Jianguomenwai Dajie
 Beijing 100020, CHINA
 tel: 86-10-6532-6668 ext. 111
 fax: 86-10-6532-5495
 e-mail: a.watson@fordfoundation.org

LI Xuesong
 Director, Division of Economic Marketing
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-8519-5712
 fax: 86-10-6512-6118
 e-mail: xsli@cass.org.cn, lixs@public.bta.net.cn

LI Ruoyu
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7145
 fax: 86-10-6855-8210
 e-mail: lry@mx.cei.gov.cn

ZHANG Tao
 Deputy-Director, Division of Economic Modeling
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-8519-5712
 fax: 86-10-6512-6118
 e-mail: zhangtao@cass.org.cn

WANG Tongsan
 Director
 Chinese Academy of Social Sciences
 No. 5 Jianguomennei Street
 Beijing 100732, CHINA
 tel: 86-10-6513-7561
 fax: 86-10-6512-6118
 e-mail: tswang@mx.cei.gov.cn

CHENG Weili
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7126
 fax: 86-10-6855-8210
 e-mail: chengwl@mx.cei.gov.cn

HAO Yanfei
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanlihelu
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7134
 fax: 86-10-6855-8210
 e-mail: hyf@mx.cei.gov.cn

YANG Yang
 Director-General
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-8519-6362
 fax: 86-10-8519-6152
 e-mail:

ZHANG Yaxiong
 Department of Economic Forecasting
 State Information Centre
 No. 58 Sanliheli
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7129
 fax: 86-10-6855-8210
 e-mail: zhangyx@mx.cei.gov.cn

YU Yongding
 Director, Institute of World Economics and Politics
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-6512-6180
 fax: 86-10-6512-6105
 e-mail: yuyd@cass.org.cn

LIANG Youcai
 State Information Center
 No. 58 Sanliheli
 Xicheng District
 Beijing 10045, CHINA
 tel: 86-10-6855-8932
 fax: 86-10-6855-8262
 e-mail: ycliang@mx.cei.gov.cn

WANG Yuanhong
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanliheli
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-7120
 fax: 86-10-6855-8210
 e-mail: wangyh@mx.cei.gov.cn

LI Yang
 Director, Institute of Finance and Banking
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-8519-5331
 fax: 86-10-6513-8307
 e-mail: liyangh@vip.sina.com

YAO Yixin
 International Department
 Ministry of Finance
 3, Nansanxiang, Sanlihe
 Xicheng District
 Beijing 100820, CHINA
 tel: 86-10-6855-3167
 fax: 86-10-6855-2589
 e-mail:

ZHANG Yongjun
 Department of Economic Forecasting
 State Information Center
 No. 58 Sanliheli
 Xicheng District
 Beijing 100045, CHINA
 tel: 86-10-6855-8126
 fax: 86-10-6855-8210
 e-mail: zyj@mx.cei.gov.cn

ZHANG Youyun
 Deputy Director-General
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-8519-5133
 fax: 86-10-8519-6152
 e-mail: zhangyy@cass.org.cn

ZHOU Yunfan
 Director, Office of International
 Chinese Academy of Social Sciences
 5, Jianguomennei Street,
 Beijing 100732, CHINA
 tel: 86-10-8519-5135
 fax: 86-10-8519-6152
 e-mail: zhouyf@cass.org.cn

ZHENG Yuxin
Deputy-Director
Chinese Academy of Social Sciences
5, Jianguomennei Street,
Beijing 100732, CHINA
tel: 86-10-6525-3661
fax: 86-10-6512-6118
e-mail: zhengyuxin@cass.org.cn

Natalia Salazar
Fedesarrollo
Calle 78 # 9 -91
Bogota, COLOMBIA
tel: 57-1-312-5300
fax: 57-1-212-6073
e-mail: nsalazar@fedesarrollo.org.co

Danijel Nestic
Institute for Economics, Zagreb
Trg. J.F. Kennedy 7
10000 Zagreb, CROATIA
tel: 385-1-2362-200
fax: 385-1-2335-165
e-mail: dnestic@eizg.hr

Grane Høegh
Statistics Denmark
Sejrøgade 11
2100 København Ø, DENMARK
tel: 45-39-17-3772
fax: no fax
e-mail: grh@dst.dk

Hakim Ben Hammouda
Director, Trade Finance & Economic Development
Division (TFED)
United Nations Economic Commission for Africa
P.O. Box 3001
Addis Ababa, ETHIOPIA
tel: 251 11 551-6629
fax: 251 11 551 3038
e-mail: hbenhammouda@uneca.org

Luis Garcia Echeverria
Universidad Javeriana, Bogota
Facultad de Ciencias Economicas y Administrat
Calle 40 No. 6-23 Piso 8
Bogota, COLOMBIA
tel: 57-1- 320-8320 ext 5128
fax: 57-1- 340-6820
e-mail: lgarcia@javeriana.edu.co

Juan-Rafael Vargas
Escuela de Economia
Universidad de Costa Rica
San Pedro, CP 2060, COSTA RICA
tel: 506-207-4334
fax: 506-207-5241
e-mail: jrvargas@cariari.ucr.ac.cr

Per Bremer Rasmussen
Forsikring & Pension
Danish Insurance Association
House of Danish Insurance
Amaliegade 10
DK-1256 Copenhagen K, DENMARK
tel: 45-33-43-5601
fax: 45-33-43-5501
e-mail: pbr@ForsikringensHus.dk

Martin Lindpere
Economics Department
Bank of Estonia
Estonia Pst. 13
Tallinn 15095, ESTONIA
tel: 372-668-0898
fax: 372-668-0949
e-mail: martin.lindpere@epbe.ee

Leonce Ndikumana
UNECA
P.O. Box 3001
Addis Ababa, ETHIOPIA
tel: 251-11-544-3483
fax: 251-11-551-3038
e-mail: lndikumana@uneca.org

Hannu Viertola
 Economics Department
 Bank of Finland
 Snellmanninaukio, Helsinki
 P.O. Box 160
 FIN - 00 101 Helsinki, FINLAND
 tel: 358-10-831-2425
 fax: 358-9-622-1882
 e-mail: hannu.viertola@bof.fi

Andrea Goldstein
 OECD Development Centre
 2 rue Andre-Pascal, 75775 Paris Cedex 16
 75775 Paris Cedex 16, France
 tel: 33-1-4524-8946
 fax: 33-1-4430-6150
 e-mail:

Kenneth G Ruffing
 OECD Development Centre
 2, rue Andre-Pascal
 75775 Paris Cedex 16, FRANCE
 tel: 33-1-4524-9584
 fax: 33-1-4430-6150
 e-mail: kennth.ruffing@oecd.org;
 kennethruffing@aol.com

Pavlos Karadeloglou
 European Central Bank
 Kaiserstrasse 29
 D-60311 Frankfurt am Main, GERMANY
 tel: 49-69-1344-7649
 fax: 49-69-1344-8550
 e-mail: Pavlos.Karadeloglou@ecb.int

Stella Balfoussias
 Center of Planning & Economic Research
 Amerikis 11
 Athens 106 72, GREECE
 tel: 30-210-363-0130
 fax: 30-210-361-1136
 e-mail: stbalf@kepe.gr

Jean-Louis Brillet
 INSEE
 timbre D301 room 1032
 18 bd Adolphe Pinard
 75014 Paris Cedex 14, FRANCE
 tel: 331-4117-5316
 fax: 331-4117-6644
 e-mail: jbrillet@yahoo.fr; jean-louis.brillet@insee.fr

Louka Katseli
 OECD Development Centre
 2 rue Andre-Pascal, 75775 Paris Cedex 16
 75775 Paris Cedex 16, France
 tel: 33-1-4524-9584
 fax: 33-1-4330-6150
 e-mail: Louka.Katseli@oecd.org

Roland Döhrn
 RWI Essen
 Hohenzollernstr. 1-3
 D-45128 Essen, GERMANY
 tel: 49-201-8149-262
 fax: 49-201-8149-200
 e-mail: doehrn@rwi-essen.de

Cletus Dordunoo
 ClayDord Consult
 University Post Office, P.O. Box LG 46
 Legon, Accra, GHANA
 tel: 233-24-4666-392
 fax: 233-21-502721
 e-mail: claydord@yahoo.co.uk;
 ckdordunoo@yahoo.co.uk

Win-Lin Chou
 Department of Economics
 The Chinese University of Hong Kong
 Shatin, N.T., HONG KONG
 tel: 852-2609-8001
 fax: 852-2-603-5805
 e-mail: winlinchou@cuhk.edu.hk

Andras Simon
 H-1125 Trencsenyi u 12
 Budapest, HUNGARY
 tel: 36-1-202-3210
 fax:
 e-mail: simon.andras@pantelweb.hu

Viktor Varpalotai
 Corvinus University of Budapest
 Fovam ter 8
 H-1093 Budapest, HUNGARY
 tel: 361-426-2800
 fax: 361-428-2590
 e-mail: varpalotai@mnbb.hu

Pami Dua
 Delhi School of Economics
 University of Delhi
 Delhi 110007, INDIA
 tel: 91-11-2766-6535
 fax: 91-11-2766-7159
 e-mail: dua@econ.dse.org; pamidua@airtelbroadband.in

Rachel Sheinin
 Economic Models Ltd.
 Gibor Sport Bldg
 7 Menahem Begin St.
 Ramat-Gan 52681, ISRAEL
 tel: 972-3-611-4242
 fax: 972-3-611-4243
 e-mail: eml@modelim.co.il

Yacov Sheinin
 Economic Models Ltd.
 Gibor Sport Bldg
 7 Menahem Begin St.
 Ramat-Gan 52681, ISRAEL
 tel: 972-3-611-4242
 fax: 972-3-611-4243
 e-mail: eml@modelim.co.il

Carlo D'Adda
 Department of Economic Sciences
 University of Bologna
 Strada Maggiore 45
 40126 Bologna, ITALY
 tel: 39-51-209-2618
 fax: 39-51-209-2664
 e-mail: dadda@spbo.unibo.it

Kanemi Ban
 Graduate School of Economics
 Osaka University
 1-7, Machikaneyama
 Toyonaka
 Osaka 560-0043, JAPAN
 tel: 81-6-6850-5221
 fax: 81-6-6850-5256
 e-mail: ban@econ.osaka-u.ac.jp

Sukha Shin
 Korea Development Institute
 207-41 Choengnyang
 Dongdaemoon
 Seoul, 130-012, KOREA
 tel: 82-2-958-4095
 fax: 82-2-958-4088
 e-mail: sshin@kdi.re.kr

Dilli Raj Khanal
 Chairman
 Institute for Policy Research & Development (IPRAD)
 P.O. Box No. GPO 8975, EPC 994
 Maitigmar, Kathmandu, NEPAL
 tel: 977-1-427-1840
 fax: 977-1-467-1597
 e-mail: khanaldr@yahoo.com; drkhanal@gmail.com

Eilev Jansen
 Research Department/530
 Statistics Norway
 Postboks 8131, Sentrum
 0033 Oslo, NORWAY
 tel: 47-9138-7583
 fax: 47-2109-0040
 e-mail: eja@ssb.no

Mette Rolland
 The Financial Supervisory Authority of Norway
 P. O. Box 100 Bryn
 N-0611 Oslo, NORWAY
 tel: 47-22-93-9833
 fax: 47-22-65-6022
 e-mail: mette.rolland@kredittilsynet.no

Dennis Arroyo
 National Planning and Policy Staff
 NEDA
 #12 NEDA Building
 Blessed Jose Maria Escriva Drive
 Ortigas Center, Pasig City 1605, PHILIPPINES
 tel: 632-631-3283/3712
 fax: 632-631-3721
 e-mail: dmarroyo@neda.gov.ph

Aleksander Welfe
 Institute of Econometrics and Statistics
 University of Lodz
 41, Rewolucji 1905r.
 90214 Lodz, POLAND
 tel: 48-42-6355-172, 175
 fax: (48-42) 636 9432
 e-mail: emfalw@uni.lodz.pl

Alexey Makushkin
 Accounting Chamber of Russia
 2, str. Zubovskaya, 2
 119992 Moscow, RUSSIA
 tel: 7495-986-0509
 fax: 7495-986-0952
 e-mail: amakushkin@unmail.ru

Ján Haluska
 INFOSTAT, Institute of Informatics & Statistics
 Dúbravská cesta 3
 845 24 Bratislava 45, SLOVAK REPUBLIC
 tel: 421-2-5937-9380
 fax: 421-2-5479-1463
 e-mail: haluska@infostat.sk

Masood Ahmed Qazi
 Institute of Business Administration
 Social Policy and Development Centre
 15, Maqbool Co-operative Housing Society
 Block 7 & 8, P.O. Box 13037
 Karachi - 75350, PAKISTAN
 tel: 92-21-111-677-677
 fax: 92-21-453-4285
 e-mail: masood@spdc-pak.com

Wladyslaw Welfe
 Institute of Econometrics and Statistics
 University of Lodz
 41, Rewolucji 1905r
 90-214 Lodz, POLAND
 tel: 48-42-6355-172/678-6863
 fax: 48-42-6355-025
 e-mail: emfiws@uni.lodz.pl

Constantin Ciupagea
 SERA
 Inst. Of World Economy/Romanian Centre for
 Economic Modelling
 Calea 13 Septembrie no. 13,
 Canada Academiei, Floor 5 East
 Bucharest, sector 5, postal code 050711, ROMANIA
 tel: 40-21-318-2455
 fax: 40-21-311-8992
 e-mail: Constantin.Ciupagea@gov.ro

Mun Heng Toh
 Department of Business Policy, NUS Business School
 National University of Singapore
 1 Business LINK, BIZ Building #02-01
 117592, SINGAPORE
 tel: 65-6874-6386
 fax: 65-6779-5059
 e-mail: biztohmh@nus.edu.sg

Michal Olexa
 INFOSTAT, Institute of Informatics & Statistics
 Dúbravská cesta 3
 845 24 Bratislava 45, SLOVAK REPUBLIC
 tel: 421-2-5937-9277
 fax: 421-2-5479-1463
 e-mail: olexa@infostat.sk

Franjo Stiblar
 Ekonomski InSTITUTE Pravne Fakultete
 University of Ljubljana
 Presernova 21
 1000 Ljubljana, SLOVENIA
 tel: 386-1-252-1688
 fax: 386-1-425-6870
 e-mail: franjo.stiblar@eipf.si

Adolfo Castilla
 Universidad Antonio de Nebrija
 C/ Pirineos, 55
 28040 Madrid, SPAIN
 tel: 34-91-452-1100
 fax: 34-91-452-1100
 e-mail: acastillag@telefonica.net

Faiza Awad Mohamed Osman
 Macro-economic Oplicie Directorate
 Ministry of Finance and National Economy
 P.O. Box 2092
 Nile Avenue B.O. Office 296
 Khartoum, SUDAN
 tel: 249-912-118-049
 fax: 249-183-780-351
 e-mail: faiza_awad@hotmail.com

Sudip Ranjan Basu
 DITC, Trade Analysis Branch
 UNCTAD
 Palais des nations
 Office E-8067
 CH-1211 Geneva 10, SWITZERLAND
 tel: 41-22-907-5553
 fax: 41-22-907-0044
 e-mail: sudip.ranjan.basu@unctad.org

Ji Chou
 Department of Economics
 Hsieh Hsin University
 111 Mu-Cha Road, Sec 1
 Taipei 11645, TAIWAN PROVINCE OF CHINA
 tel: 886-2-2236-8225 #63413
 fax: 886-2-2236-1658
 e-mail: chouji@cc.shu.edu.tw

Jan van Heerden
 Department of Economics
 University of Pretoria
 Pretoria 0002, SOUTH AFRICA
 tel: 2712-420-3451
 fax: 2712-362-5207
 e-mail: jvheerde@up.ac.za

Santiago Labiano Gorraiz
 CEPREDE
 Universidad Autonoma Madrid
 28049 Cantoblanco Madrid, SPAIN
 tel: 34-91-497-5079
 fax: 34-91-497-8670
 e-mail: santiago.labiano@ceprede.com

Svante Oberg
 Deputy Governor
 Sveriges Riksbank
 103 37 Stockholm, SWEDEN
 tel: 46-8-787-0109
 fax: 46-8-210-531
 e-mail: svante.oberg@riksbank.se

Délia Nilles
 Institute 'Créa'
 Université de Lausanne
 BFSH1
 CH-1015 Lausanne-Dorigny, SWITZERLAND
 tel: 41-21-692-3353
 fax: 41-21-692-3355
 e-mail: delia.nilles@unil.ch

Chung-Shu Wu
 The Institute of Economics
 Academia Sinica
 128 Sec. 2, Academia Rd.
 Nankang, Taipei 11529, TAIWAN PROVINCE OF
 CHINA
 tel: 886-2-2782-2791 ext 306
 fax: 886-2-2782-8628
 e-mail: cwu@econ.sinica.edu.tw

Cengiz Cihan
 Research Department
 The Central Bank of the Republic of Turkey
 15th Floor Istiklal Caddesi
 NO: 10 06100 Ulus
 Ankara, TURKEY
 tel: 90-312-324-2062
 fax: 90-312-324-2303
 e-mail: cengiz.cihan@tcmb.gov.tr

Valeriy Heyets
 Institute of Economic Forecasting
 National Academy of Sciences of Ukraine
 26, Panas Myrny St.
 Kiev-11, 01011, UKRAINE
 tel: 380-44-280-0417/380-44-280-1234
 fax: 380-44-280-8869
 e-mail: gvm@ief.org.ua

Stephen Hall
 Department of Economics
 University of Leicester
 University Road
 Leicester LE1 7RH, UNITED KINGDOM
 tel: 44-116-252-2827
 fax: 44-116-252-2908
 e-mail: s.g.hall@le.ac.uk

F. G. Adams
 39 Stafford Road
 Newton, MA 02459, USA
 tel: 617-332-2996
 fax: 617-965-6395
 e-mail: adams@ssc.upenn.edu

Timothy Callen
 Research Department
 International Monetary Fund
 700 19th Street N
 Washington, D.C., USA
 tel: 202-623-8873
 fax: 202-589-8873
 e-mail: tcallen@imf.org

Şeref Saygili
 Research Department
 The Central Bank of the Republic of Turkey
 Istiklal Caddesi
 NO: 10 06100 Ulus
 Ankara, TURKEY
 tel: 90-312-324-2062
 fax: 90-312-324-2303
 e-mail: seref.saygili@tcmb.gov.tr

Ray Barrell
 National Institute of Economic and Social Research
 2 Dean Trench Street
 Smith Square
 London SW1P 3HE, UNITED KINGDOM
 tel: 44-207-654-1925
 fax: 44-207-654-1900
 e-mail: RBarrell@niesr.ac.uk

Clark Abt
 Abt Associates Inc.
 19 Follen St.
 Cambridge, MA 02138, USA
 tel: 617-876-2835
 fax: 617-234-0007
 e-mail: clarkabt@aol.com

Clive Altshuler
 DESA
 United Nations
 2 UN Plaza Room 2176
 New York, Ny 10017, USA
 tel: 212-963-4707
 fax: 212-963-4116
 e-mail: altshuler@un.org

Robert Coen
 Department of Economics
 Northwestern University
 2001 Sheridan Road
 Chicago, IL 60208, USA
 tel: 847-491-8207
 fax: 847-491-7001
 e-mail: rcoen@northwestern.edu

Marva Corley
 DESA
 United Nations
 2 United Nations Plaza, Room 2286
 New York, NY 10017, USA
 tel: 917-367-9478
 fax: 212-963-1061
 e-mail: corley@un.org

Clive Granger
 University of California, San Diego
 9500 Gilman Drive
 La Jolla, CA 92093-0508, USA
 tel: 858-534-3856
 fax: 858-534-7040
 e-mail: cgranger@ucsd.edu

Bert Hickman
 Department of Economics
 Stanford University
 Stanford, CA 94305, USA
 tel: 650-329-8012
 fax: 650-725-5702
 e-mail: bhickman@stanford.edu

Keiji Inoue
 DESA
 United Nations
 2 UN Plaza
 Office DC2-2174
 New York, NY 10017, USA
 tel: 917-367-2439
 fax: 212-963-1061
 e-mail: inouek@un.org

Cornelia Kaldewei
 Department of Economic and Social Affairs
 United Nations
 Office DC2-2132
 2 United Nations Plaza
 New York, NY 10017, USA
 tel: 917-367-3011
 fax: 212-963-1061
 e-mail: kaldewei@un.org

Alfredo Coutino
 Center for Economic Forecasting of Mexico (CKF)
 P.O. Box 38521
 Philadelphia, PA 19104, USA
 tel: 215-219-6214
 fax: 302-777-3403
 e-mail: acoutino@att.net

Hsiang-Ling Han
 Economics Department
 Babson College
 414 Westgate Hall
 Wellesley, MA 02457-0310, USA
 tel: 781-239-5851
 fax: 781-239-5239
 e-mail: han@babson.edu

Pingfan Hong
 Development Policy Analysis Division
 United Nations
 DC-2-2154
 New York, NY 10017, USA
 tel: 212-963-4701
 fax: 212-963-1061
 e-mail: hong@un.org

Alex Izurieta
 DESA
 United Nations
 2 UN Plaza - DC2-2076
 New York, New York 10017, USA
 tel: 917-367-8108
 fax: 917-963-1061
 e-mail: izurieta@un.org

Robert Kaufmann
 Center for Energy and Environ. Studies
 Boston University
 675 Commonwealth Ave., Suite 141
 Boston, MA 02215, USA
 tel: 617-353-3940
 fax: 617-353-5986
 e-mail: kaufmann@bu.edu

Malinka Koparanova
 DESA/DPAD
 United Nations
 Two UN Plaza DC2-2160
 New York, NY 10017, USA
 tel: 212-963-6808
 fax: 212-963-1061
 e-mail: koparanova@un.org

Hung-Yi Li
 United Nations
 DC2-2146
 2 UN Plaza
 New York, NY 10017, USA
 tel: 917-367-9008
 fax:
 e-mail: lih@un.org

Suleyman Ozmucur
 Department of Economics
 University of Pennsylvania
 3718 Locust Walk
 Philadelphia, PA 19104-6297, USA
 tel: 215-898-6765
 fax: 215-898-4477
 e-mail: ozmucur@ssc.upenn.edu

Josephine Su
 China University of Technology
 200 E. 57 Street, Apt 20 B
 New York, NY 10022, USA
 tel: 212-980-1974
 fax: 212-980-1937
 e-mail: jose@cute.edu.tw

Robert Vos
 Director of Development Policy and Analysis
 United Nations - DESA
 2 United Nations Plaza
 Room DC2-2170
 New York 10017, USA
 tel: 212-963-4838
 fax: 212-963-1061
 e-mail: vos@un.org

Yuzo Kumasaka
 ITeconomy Advisors Inc.
 150 W. 51st St., Suite 2006
 New York, NY 10019, USA
 tel: 212-489-1190
 fax: 212-489-1190
 e-mail: kumasaka@iteconomy.com

William Meyers
 University of Missouri-Columbia
 101 Park Deville Dr., Suite E
 Columbia, MO 65203, USA
 tel: 573-882-3576
 fax: 573-884-4688
 e-mail: meyersw@missouri.edu

Vincent Su
 Baruch College, City University of New York
 200 E. 57 Street, Apt 20 B
 New York, NY 10022, USA
 tel: 212-980-1974
 fax: 212-980-1937
 e-mail: Vincent_Su@baruch.cuny.edu

Hans Timmer
 Leader Global Trends Team, DECPG
 The World Bank
 1818 H Street NW
 Washington, DC 20433, USA
 tel: 202-458-8983
 fax: 202-522-2578
 e-mail: htimmer@worldbank.org/htimmer@aol.com

Carl Weinberg
 High Frequency Economics, Ltd.
 200 Summit Lake Drive
 Valhalla, NY 10595, USA
 tel: 914-773-2121
 fax: 914-773-1260
 e-mail: carl@hftoday.com

Andres Cardenas
METROECONOMICA
Centro Prof. Sta. Paula, Torre A, Piso 7, Of. 78,
Av. Circunvalacion del Sol, Santa Paula
Caracas 1066 A., VENEZUELA
tel: 58-212-985-0454
fax: 58-212-985-5321
e-mail: metroeconomica@cantv.net

Cristina Rodriguez
METROECONOMICA
Centro Prof. Sta. Paula, Torre A, Piso 7, Of. 78,
Ave. Circunvalacion del Sol, Urb. Santa Paula
Caracas, 1066 A., VENEZUELA
tel: 58-212-985-0454
fax: 58-212-985-5321
e-mail: metroclientes@cantv.net,
lcrodriguez@yahoo.com

Joseph Mverecha
Reserve Bank of Zimbabwe
P.O. Box 1283
Harare, ZIMBABWE
tel: 263-4-70-3111
fax: 263-4-70-5978
e-mail: jmverecha@rbz.co.zw